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92d CONGRESS, SECOND SESSION

Fiscal Year 1973

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS UNITED STATES SENATE

NINETY-SECOND CONGRESS

SECOND SESSION

ON

H.R. _____

AN ACT MAKING APPROPRIATIONS FOR THE DEPARTMENT OF DEFENSE FOR THE FISCAL YEAR ENDING JUNE 30, 1973, AND FOR OTHER PURPOSES

Printed for the use of the Committee on Appropriations

PART 1

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[1] Deceased, July 27, 1972.
[2] Appointed, Aug. 10, 1972.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

THURSDAY, FEBRUARY 24, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:10 a.m., in room S–128, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Pastore, Young, Allott, Cotton, Case, and Symington.

DEPARTMENT OF DEFENSE

STATEMENT OF HON. MELVIN R. LAIRD, SECRETARY OF DEFENSE

ACCOMPANIED BY:
ADM. THOMAS H. MOORER, U.S. NAVY, CHAIRMAN, JOINT CHIEFS OF STAFF
HON. ROBERT C. MOOT, ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
RADY A. JOHNSON, ASSISTANT TO THE SECRETARY (LEGISLATIVE AFFAIRS)

REQUESTS TO BE CONSIDERED

Chairman ELLENDER. The subcommittee will please come to order.

The subcommittee is pleased to welcome two old friends this morning, the Secretary of Defense, Hon. Melvin R. Laird, and the Chairman of the Joint Chiefs of Staff, Adm. Thomas H. Moorer. Gentlemen, it is always a pleasure to have you, and we are looking forward to your presentations of the Department of Defense budget for fiscal year 1973.

Previous to your appearance, Mr. Secretary, the committee, in order to save time and yet accomodate the witnesses, has already heard testimony for some of the departments.

In addition, on February 15, the committee heard Mr. Richard Helms, Director of the Central Intelligence Agency, who provided a classified briefing.

This subcommittee will be considering those Department of Defense requests for the following appropriations: Military personnel; retired pay; operation and maintenance; procurement; research, development, test, and evaluation; and the special foreign currency program. The fiscal year 1973 requests for these appropriations total $76,731,384,000. The Department of Defense Appropriation Act, 1972,

included $70,408,893,000 for these appropriations and there are now pending fiscal year 1972 supplementals totaling $2,907,456,000, which makes a fiscal year 1972 adjusted total of $73,316,349,000.

(Editor's Note: Based on final action on the supplemental requests, the fiscal year 1972 total for the appropriations to be considered by the subcommittee is $72,856,995,000. The total budget estimate to be considered by the subcommittee was increased to $76,986,184,000—an increase of $254,800,000 as a result of the budget amendment of March 29, 1972 (H. Doc. 92-272).)

Chairman ELLENDER. The following fiscal year 1973 requests of the Department of Defense will be considered by other subcommittees: Military construction programs, $2,041 million; family housing programs, $977 million; civil defense activities, $88 million; and military assistance programs, $1,307 million.

I will include in the record at this point a tabulation setting out the fiscal year 1972 appropriation and the fiscal year 1973 request for each appropriation. I have instructed the staff to revise this tabulation to reflect the final action on the fiscal year 1972 supplementals and any fiscal year 1973 budget amendments.

(The tabulation follows:)

(1)	Fiscal year 1972 appropriation (Public Law 92-204) (2)	Fiscal year 1972 pay increase supplemental (Public Law 92-306) (3)	Adjusted fiscal year 1972 total, including military and civilian pay increases (4)	Original fiscal year 1973 budget request including Jan. 1, 1972, pay raise (5)	March 29 budget amendment (H. Doc. 92-272) (6)	Revised fiscal year 1973 budget request including Jan. 1, 1972, pay raise (7)
BY FUNCTIONAL TITLES						
Title I—Military personnel:						
Military personnel, Army	$7,315,637,000	$696,738,000	$8,012,375,000	$7,703,063,000		$7,703,063,000
Military personnel, Navy	4,558,571,000	469,940,000	5,028,511,000	5,352,749,000		5,352,749,000
Military personnel, Marine Corps	1,332,550,000	135,236,000	1,467,786,000	1,537,792,000		1,537,792,000
Military personnel, Air Force	6,470,283,000	530,389,000	7,000,672,000	7,251,075,000		7,251,075,000
Reserve personnel, Army	385,084,000	17,792,000	402,876,000	529,534,000		529,534,000
Reserve personnel, Navy	182,791,000	19,033,000	201,824,000	230,640,000		230,640,000
Reserve personnel, Marine Corps	57,368,000	2,236,000	59,604,000	78,155,000		78,155,000
Reserve personnel, Air Force	101,716,000	4,468,000	106,184,000	131,442,000		13,,442,000
National Guard personnel, Army	485,954,000	49,431,000	535,385,000	616,250,000		616,250,000
National Guard personnel, Air Force	134,620,000	14,263,000	148,883,000	169,359,000		169,359,000
Total, title I, military personnel	21,024,574,000	1,939,526,000	22,964,100,000	23,600,059,000		23,600,059,000
Title II—Retired pay, Defense	3,777,134,000	144,312,000	3,921,446,000	4,358,684,000		4,358,684,000
Title III—Operation and maintenance:						
Operation and maintenance, Army	6,661,212,000	56,276,000	6,717,488,000	6,903,714,000		6,903,714,000
Operation and maintenance, Navy	5,021,740,000	76,405,000	5,098,145,000	5,134,568,000		5,134,568,000
Operation and maintenance, Marine Corps	360,553,000	2,500,000	363,053,000	383,263,000		383,263,000
Operation and maintenance, Air Force	6,224,881,000	81,703,000	6,306,584,000	6,202,405,000		6,202,405,000
Operation and maintenance, Defense agencies	1,202,465,000	22,500,000	1,224,965,000	1,291,101,000		1,291,101,000
Operation and maintenance, Army National Guard	369,951,000	8,106,000	378,057,000	468,510,000		468,510,000
Operation and maintenance, Air National Guard	413,428,000	7,204,000	420,632,000	461,743,000		461,743,000
National Board for the Promotion of Rifle Practice, Army	122,000		122,000	126,000		126,000
Claims, Defense	39,000,000		39,000,000	52,900,000		52,900,000
Contingencies, Defense	5,000,000		5,000,000	5,000,000		5,000,000
Court of Military Appeals, Defense	869,000		69,000	914,000		914,000
Total, title III, operation and maintenance	20,299,231,000	254,694,000	20,553,925,000	20,904,244,000		20,904,244,000

DEPARTMENT OF DEFENSE APPROPRIATION BILL—FISCAL YEAR 1973—Continued

(1)	Fiscal year 1972 appropriation (Public Law 92-204) (2)	Fiscal year 1972 pay increase supplemental (Public Law 92-305) (3)	Adjusted fiscal year 1972 total, including military and civilian pay increases (4)	Original fiscal year 1973 budget request including Jan. 1, 1972, pay raise (5)	March 29 budget amendment (H. Doc. 92-272) (6)	Revised fiscal year 1973 budget request including Jan. 1, 1972, pay raise (7)
Title IV—Procurement:						
Aircraft procurement, Army	$90,400,000	----------	$90,400,000	$134,500,000	----------	$134,500,000
Missile procurement, Army	940,820,000	----------	940,820,000	1,153,400,000	----------	1,153,400,000
Procurement of weapons and tracked combat vehicles, Army	145,500,000	----------	145,500,000	259,500,000	----------	259,500,000
Procurement of ammunition, Army	1,418,300,000	----------	1,418,300,000	1,129,200,000	----------	1,129,200,000
Other procurement, Army	512,300,000	----------	512,300,000	648,800,000	----------	648,800,000
Procurement of aircraft and missiles, Navy	3,855,000,000	----------	3,855,000,000	3,871,200,000	----------	3,871,200,000
Shipbuilding and conversion, Navy	3,005,200,000	----------	3,005,200,000	3,564,300,000	----------	3,564,300,000
Other procurement, Navy	1,641,603,000	----------	1,641,603,000	2,023,200,000	----------	2,023,200,000
Procurement, Marine Corps	103,100,000	----------	103,100,000	191,100,000	----------	191,100,000
Aircraft procurement, Air Force	2,899,000,000	----------	2,899,000,000	2,612,700,000	$113,800,000	2,726,500,000
Missile procurement, Air Force	1,633,700,000	----------	1,633,700,000	1,772,300,000	----------	1,772,300,000
Other procurement, Air Force	1,478,998,000	----------	1,478,998,000	1,883,300,000	----------	1,883,300,000
Procurement, Defense agencies	52,971,000	----------	52,971,000	69,730,000	----------	69,730,000
Total, title IV, procurement	17,776,892,000	----------	17,776,892,000	19,313,230,000	113,800,000	19,427,030,000

Title V—Research, development, test, and evaluation:						
Research, development, test, and evaluation, Army	1, 787, 656, 000	.....	1, 787, 656, 000	2, 068, 716, 000	28, 000, 000	2, 096, 716, 000
Research, development, test, and evaluation, Navy	2, 352, 319, 000	.....	2, 352, 319, 000	2, 729, 987, 000	63, 800, 000	2, 793, 787, 000
Research, development, test, and evaluation, Air Force	2, 887, 944, 000	.....	2, 887, 944, 000	3, 193, 177, 000	39, 000, 000	3, 232, 177, 000
Research, development, test, and evaluation, Defense agencies	441, 143, 000	.....	441, 143, 000	509, 887, 000	10, 200, 000	520, 087, 000
Emergency fund, Defense	50, 000, 000	.....	50, 000, 000	50, 000, 000	.....	50, 000, 000
Total, title V, research, development, test, and evaluation	7, 519, 062, 000	.....	7, 519, 062, 000	8, 551, 767, 000	141, 000, 000	8, 692, 767, 000
Title VI—Special foreign currency program	12, 000, 000	.....	12, 000, 000	3, 400, 000	.....	3, 400, 000
Total, titles I–IV, Department of Defense appropriations	70, 408, 893, 000	2, 338, 532, 000	72, 747, 425, 000	76, 731, 384, 000	254, 800, 000	76, 986, 184, 000
Title VII—Anti-Ballistic-Missile Construction:						
Military construction, Army	98, 500, 000	.....	98, 500, 000	NA	.....	NA
Family housing, Defense	11, 070, 000	.....	11, 070, 000	NA	.....	NA
Total, title VII, anti-ballistic-missile construction	109, 570, 000	.....	109, 570, 000	NA	.....	NA
Total, Department of Defense appropriation bill	70, 518, 463, 000	2, 338, 532, 000	72, 856, 995, 000	76, 731, 384, 000	254, 800, 000	76, 986, 184, 000
Summary by organizational component:						
Army	20, 112, 946, 000	828, 343, 000	20, 941, 289, 000	21, 615, 313, 000	28, 000, 000	21, 643, 313, 000
Navy	22, 470, 795, 000	705, 350, 000	23, 176, 145, 000	25, 096, 954, 000	63, 800, 000	25, 160, 754, 000
Air Force	22, 244, 570, 000	638, 027, 000	22, 882, 597, 000	23, 677, 501, 000	152, 800, 000	23, 830, 301, 000
Defense and Defense Agencies	1, 803, 448, 000	22, 500, 000	1, 825, 948, 000	1, 982, 932, 000	10, 200, 000	1, 993, 132, 000
Retired pay	3, 777, 134, 000	144, 312, 000	3, 921, 446, 000	4, 358, 684, 000	.....	4, 358, 684, 000
Subtotal, titles I–VI	70, 408, 893, 000	2, 338, 532, 000	72, 747, 425, 000	76, 731, 384, 000	254, 800, 000	76, 986, 184, 000
Safeguard construction	109, 570, 000	.....	109, 570, 000	.....	.....	.....
Grand total	70, 518, 463, 000	2, 338, 532, 000	72, 856, 995, 000	76, 731, 384, 000	254, 800, 000	76, 986, 184, 000

SUBCOMMITTEE PROCEDURE

Chairman ELLENDER. I have directed the staff to review all of the statements and justifications and prepare questions on the requests for the various programs and activities. It will not be possible to deal with all of these questions during the hearings, and those that I do not ask I will submit to the witness and answers can be submitted for the record. The subcommittee has followed this procedure for a number of years.

Senator YOUNG. Mr. Chairman, I expect to have a number of questions on each of the requests and, if it is agreeable, I will follow the same procedure.

Chairman ELLENDER. That will be fine.

You may proceed, Mr. Laird.

Secretary LAIRD. Mr. Chairman and members of the committee, I have presented to you a classified statement which is some 315 pages and I also have presented to the committee an unclassifid version of that statement which runs about 203 pages. With the permission of the chairman and the committee, I will read portions of the classified version and would appreciate having the unclassified version of those portions which I do not read inserted at the proper places in the record.

Chairman ELLENDER. We will proceed on that basis.

PEACE: ACHIEVEMENT AND MAINTENANCE

Secretary LAIRD. Mr. Chairman and members of the committee, this 1972 Defense Report is about peace: how to achieve it and how to maintain it.

It will focus on what the Department of Defense has been doing and what more we plan to do to insure the continued safety and security of our Nation.

Our objective—an objective set for us by the President—is a generation of peace and a better quality of life for all Americans. The Nixon administration has devoted 3 years of constant effort to moving us toward that objective while maintaining our Nation's strength. These have been years of transition:

From war to peace.

From a wartime economy to a peacetime economy.

From a Federal budget dominated by defense expenditures to one dominated by human resource programs.

From an era of confrontation to an era of negotiation.

From arms competition toward arms limitation.

The business of peace is a serious and complex one. It cannot be described in simple terms. It cannot be achieved and maintained through simple solutions.

Obviously, we have not fully reached many of the goals we set for ourselves. But we have made substantial progress. This Defense report is an accounting to the American people of that progress, of shortcomings and of the challenges and changes ahead.

It is with the hope of securing deeper understanding and broader support of our plan for peace that I submit this Defense report. It traces the orderly progression of President Nixon's program in terms that I believe all Americans can understand. For our focus is on the future: on a future which recognizes mistakes of the past; a future in which each man hopefully can live at peace with his neighbor and each nation can settle its disputes without resort to war.

My first Defense report was a transition document. My second Defense report, as its title made clear, described a defense program designed to move us toward a strategy of realistic deterrence.

This 1972 report takes us another major step forward. It completes the transition to a fully developed national security strategy of realistic deterrence that complements and supports the President's strategy for peace.

PRESIDENT'S INAUGURAL ADDRESS: EFFECTIVE STRATEGY FOR PEACE AND IMPROVED QUALITY OF LIFE

A new era in U.S. national security policy began on January 20, 1969, with President Nixon's inaugural address. He declared that his highest priority goals were to establish an effective strategy for peace and to improve the quality of life.

Following his inaugural address, the President enunciated the Nixon doctrine at Guam in July 1969. Its elements, and their relation to his strategy for peace and the national security strategy of realistic deterrence, are depicted on the first chart at the end of this report. Let me insert that chart in the record at this point along with another chart that graphically portrays the strategy of realistic deterrence. I think those charts show the relationships very clearly.

(The charts follow:)

"STRONG MILITARY DEFENSES ARE NOT THE ENEMY OF PEACE. THEY ARE THE GUARDIAN OF PEACE."
PRESIDENT NIXON 1972

THE PRESIDENT'S STRATEGY FOR PEACE

STRENGTH - PARTNERSHIP — NEGOTIATIONS

Nixon Doctrine

KEEP TREATY COMMITMENTS

PROVIDE NUCLEAR SHIELD

FURNISH ASSISTANCE

MEANINGFUL NEGOTIATIONS MADE POSSIBLE BY STRENGTH AND PARTNERSHIP

☆ ☆ ☆ ☆ ☆

STRATEGY OF REALISTIC DETERRENCE

- SUFFICIENCY FOR DETERRENCE
- TECHNOLOGICAL SUPERIORITY
- MODERNIZATION
- MOBILITY

- BURDEN SHARING
- SECURITY ASSISTANCE
- ALLIANCES
  - BILATERAL
  - MULTILATERAL
  - REGIONAL

NET ASSESSMENT
- Strategic Reality
- Political Reality
- Fiscal Reality
- Manpower Reality

TOTAL FORCE
- Strong Guard & Reserve
- Better Resource Utilization
- Planning with Allies
- Integrated Diplomatic and Political Factors

LONG RANGE PLANNING

Effective Comprehensive Planning for the Future Made Possible by Net Assessment and Total Force Planning

"WE ARE DETERMINED TO PROVIDE ADEQUATE UNITED STATES MILITARY FORCES SO THAT WE CAN, WITH OUR FRIENDS AND ALLIES, DETER WAR."
SECRETARY LAIRD 1972

NATIONAL SECURITY STRATEGY OF REALISTIC DETERRENCE

STRATEGIC SUFFICIENCY

TECHNOLOGICAL SUPERIORITY

IMPROVED READINESS AND MODERNIZATION

TOTAL RESOURCE UTILIZATION

STRONG GUARD AND RESERVE

SECURITY ASSISTANCE

NET ASSESSMENT

STRATEGIC REALITY

- Strategic Nuclear
- Theater Nuclear
- Theater Conventional
- Subtheater/ Localized

POLITICAL REALITY

- Multi-Polar World
- Soviet Global Activities
- Congressional Concerns
- Allied Concerns
- Domestic Concerns

FISCAL REALITY

- Rising Costs
- Priorities

MANPOWER REALITY

- Human Goals
- Pay Raises
- Zero Draft
- All Volunteer Force

TOTAL FORCE PLANNING

STRATEGIC NUCLEAR

- Prime U. S. Responsibility

THEATER NUCLEAR

- U. S. and Some Allies

THEATER CONVENTIONAL

- U. S. and Allies

SUBTHEATER/ LOCALIZED

- Allies and U. S.

PLANNING WITH ALLIES

- Combined
- Complementary
- Supplementary
- Unilateral

LONG RANGE PLANNING

Effective Comprehensive Planning for the Future Made Possible by Net Assessment and Total Force Planning

Coupled with positive diplomatic initiatives, the doctrine both seeks and permits a more creative relationship with our adversaries. The doctrine is derived from the strength and partnership pillars of the strategy for peace; those pillars in turn provide the essential foundation for the third pillar—a willingness to negotiate.

NATIONAL SECURITY STRATEGY OF REALISTIC DETERRENCE

From the Nixon doctrine and the strategy for peace, we in the Department of Defense developed—and the Commander in Chief approved—the national security strategy of realistic deterrence. The basic purpose of this implementing strategy is to provide, through strength and partnership, for the security of the United States and its free world allies and friends. Its aim is to discourage—and eventually to eliminate—the use of military force as a means by which one nation seeks to impose its will upon another. It seeks to deter war, but insures adequate capabilities to protect our Nation and its interests should deterrence fail. At this point I would like to insert in the record a chapter of my report that briefly describes the strategy.

(The excerpt follows:)

I. THE STRATEGY IN BRIEF

President Nixon, in his January, 1969, Inaugural Address committed this nation to the pursuit of something we have not known in this century -- an enduring peace.

At Guam, six months later, he enunciated the Nixon Doctrine.

In his first Foreign Policy Report to the Congress in early 1970, the President explained in detail his new Strategy for Peace. He insisted that attainment of lasting peace requires a foreign policy guided by three basic principles -- strength, partnership, and a willingness to negotiate. The President noted that sustained American strength remains crucial, but related this strength to a new order of partnership under the Nixon Doctrine -- a partnership in which:

> "...The United States will participate in the defense and development of allies and friends, but that America cannot -- and will not -- undertake all the defense of the free nations of the world. ... ."

In my Defense Report to the Congress last year, I described a National Security Strategy of Realistic Deterrence based upon the strength and partnership principles of the President's Strategy for Peace and designed to implement the Nixon Doctrine. Strength and partnership also provide an essential foundation for the third principle, a willingness to negotiate.

To set the stage for a comprehensive discussion of our follow-on plans, programs and actions for this year, I will briefly review this Strategy of Realistic Deterrence and its basic relationship to President Nixon's Strategy for Peace.

The Nixon Doctrine calls for a new approach to security planning. It means changing the allocation of responsibilities among Free World nations, by providing a new emphasis on shared strength. This approach has been incorporated in our National Security Strategy.

The ultimate goal of the Strategy of Realistic Deterrence is to discourage -- and ultimately to eliminate -- the use of military force as a means by which one nation seeks to impose its will upon another. Military power in the hands of nations that wish to preserve peace and freedom is an essential part of this strategy, although military power alone cannot achieve the objective. As long as the threat of

aggression against the independence and territorial integrity of nations with whom we share common interests exists, our country and our friends and allies must maintain strong military forces to deter conflict. Further our strategy must provide the defense capability necessary to protect our nation and its interests should deterrence fail.

The task before us is not easy. Successful implementation of the Strategy of Realistic Deterrence is, I believe, the most difficult and challenging national security effort this country has ever undertaken. This is so because we must move forward in an environment of virtual balance in the strategic nuclear field, and in a period of vigorous Soviet military expansion at sea, on the land, in the air and in space. In addition, we must pursue our goal with due regard for the influences of today's other constraining realities -- realities which I will discuss at some length.

Success will require deep understanding and strong support, both from Congress and the American people. For without understanding of our national objectives, and without support for the means we adopt to reach them, no strategy pursued by the representative leaders of a free and open society can possibly succeed for long when contested by a powerful, closed society. Free nations must measure the ultimate strength of their defense policies in proportion to the willing support their citizens give to those policies. A closed society is not dependent on such popular support.

A. APPROACH TO DEFENSE PLANNING

Our defense strategy is based on the three key elements of the Nixon Doctrine:

> "First, the United States will keep all of its treaty commitments.
>
> "Second, we shall provide a shield if a nuclear power threatens the freedom of a nation allied with us or of a nation whose survival we consider vital to our security.
>
> "Third, in cases involving other types of aggression we shall furnish military and economic assistance when requested and as appropriate. But we shall look to the nation directly threatened to assume the primary responsibility of providing the manpower for its defense."

From these elements, and after a thorough review of the situation as it existed at the time this Administration took office, we established the following basic criteria for national security planning for the decade of the 70's:

-- Preservation by the United States of an adequate strategic nuclear capability as the cornerstone of the Free World's nuclear deterrent.

-- Development and/or continued maintenance of Free World forces that are effective, and minimize the likelihood of requiring the employment of strategic nuclear forces should deterrence fail.

-- An International Security Assistance Program that will enhance self-defense capabilities throughout the Free World, and, when coupled with diplomatic and other actions, will encourage regional cooperation and/or security agreements among our friends and allies.

Last year I reported that these defense planning criteria, which reflect the imperatives of the Nixon Doctrine, would be implemented in harmony with the following four guidelines:

-- In deterring strategic nuclear warfare primary reliance will continue to be placed on U.S. strategic deterrent forces.

-- In deterring theater nuclear warfare the U.S. also has primary responsibility, but certain of our allies are able to share this responsibility by virtue of their own nuclear capabilities.

-- In deterring theater conventional warfare -- for example, a major war in Europe -- U.S. and allied forces share responsibility.

-- In deterring subtheater or localized warfare, the country or ally which is threatened bears the primary burden, particularly for providing manpower, but when U.S. interests or obligations are at stake we must be prepared to provide help as appropriate.

Effective deterrence, of course, is not divisible. It is based on a balanced force structure of strategic and theater nuclear weapons and adequate U.S. and allied conventional defenses. In Europe, for example, our strategic nuclear power, the theater nuclear forces of the U.S. and its allies, and the conventional forces of all the NATO Allies combine to insure that realistic deterrence is effective from the lowest level of conventional conflict to the highest level of nuclear conflict.

The four guidelines reflect our continued commitment to do our part in the common defense. But they also recognize the need for a new and evolving partnership in which our friends and allies carry a greater share of the responsibility for their own defense. The ultimate effectiveness of this new partnership, however, will depend not only on the willingness of others to assume their own responsibilities, but also on the degree to which we are prepared to assist them to do so through effective and adequate security assistance programs.

The United States must continue to maintain adequate strength to meet its responsibilities under the Strategy. The capabilities of our active forces must be improved substantially through modernization and improved readiness. At the same time, we are placing increased emphasis on our National Guard and Reserve components so that we may obtain maximum defense capabilities from the limited resources available. The strengthening of the National Guard and Reserve Forces, as well as the new order of partnership, is an integral part of the Total Force planning approach that is fundamental to the new strategy.

The Total Force approach, however, involves much more than a mere division of responsibilities or an analytical separation of potential threats into categories of conflict or required forces. The conceptual thrust of Total Force is toward the efficient integration of all relevant Free World resources to provide more security for all of us. This concept, this integration, calls for many changes and improvements. The potential and significance of the concept are profound; so are its difficulties. Total Force demands a new order of coordination and cooperation in order to permit employment of the many different resources in concert -- resources that in many cases are both scarce and difficult to relate, in any firm analytical sense, to a common objective.

We are striving to enhance partnership in dealing with the burdens of defense, looking more to our friends and allies in those areas where they have available resources to provide for their own

defense. But in doing this, we seek ways that will not create the kind of local imbalance that could invite the use of force by others to settle disputes that bear on our treaty commitments and other important interests. Our present approach in Vietnam and Korea demonstrates this, as does the burdensharing progress in NATO.

We are making substantial progress in our effort to implement Total Force planning, but it does take time to adjust from the deeply imbedded practices of the past to a more flexible and realistic system that will meet the demands of the present and future. These adjustments are being made, both in our own force planning and in planning with our allies and friends. But we face many difficult problems ahead -- problems that we intend to meet more and more effectively through a new emphasis on Net Assessment, Total Force and Long-Range Planning.

B. NET ASSESSMENT, TOTAL FORCE AND LONG-RANGE PLANNING

The three national security planning criteria for the decade of the 1970's, based on the Nixon Doctrine, have established the basic parameters within which we must do our planning. As previously noted, there are four categories of potential conflict with which we, our allies and friends, must be prepared to cope: Strategic Nuclear, Theater Nuclear, Theater Conventional and Subtheater. This means that our force planning must be focused on deriving the most realistic mixture of forces and supporting assistance possible in order to carry out the necessary tasks.

> We seek to accomplish this through the process of Total Force Planning, which I described in detail in last year's report and which calls for the use of all appropriate resources for deterrence -- U.S. and Free World -- to capitalize on the potential of available assets.

But force planning, no matter how effective, will rest on an uneasy base if it disregards a host of influences either largely or wholly beyond our ability to control, such as the nature of a potential enemy's capabilities and his likely strategy to the extent that we can perceive it. Acceptable force planning, therefore, must be based not only on a definition of our objectives, but also on a sophisticated analysis of the nature and relative importance of the various impediments and obstacles to the achievement of our objectives -- be they economic, political, technological, or military.

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We intend to accomplish this through a more coordinated emphasis on Net Assessment in my immediate office and throughout the Department of Defense. Net Assessment is a comparative analysis of those factors, military, technological, political and economic, which impede or have a potential to impede our national security objectives with those factors available or potentially available to enhance the accomplishment of those objectives. Through this process, we are able to determine how to apply our resources most effectively in order to improve our total capability to accomplish our national security goals.

It is important to bear in mind, however, that Total Force planning must be carried out both in terms of immediate as well as longer-range phased objectives. Our approach to Vietnamization illustrates this. As it has been with Vietnamization, however, this will be a difficult task since the apparent demands of the moment may sometimes have an adverse impact on what we hope to accomplish in the future.

In order to minimize this often troublesome problem, my Director of Net Assessments will be supported by and work closely with the Office of my Assistant for Long-Range Planning, whose task it will be to assure effective coordination of the Net Assessment and Total Force planning functions of the Secretary of Defense.

Through our net assessment effort to date we have a better understanding of the difficulties that lie ahead, an understanding that I will share with you in the following section.

We have made substantial progress in achieving our objectives over the past year; we have moved closer to peace through effective implementation of the Nixon Doctrine. Our budget and our proposed programs for FY 1973 are designed to continue this movement.

As a former member of the Congress, I am confident that our new approach, with its emphasis on Net Assessment and Total Force planning, will permit the Department of Defense in coming months and years to be even more responsive to the Congress as we share the responsibility for assuring our national security. The appropriate Committees of the Congress will receive more meaningful information in a form more useful to the members than ever before. As we continue to develop and refine these new comprehensive approaches to national security planning, there will undoubtedly be additional changes in the way that I utilize the resources available to the Department. I will keep you fully informed of such changes.

While there are many difficulties ahead -- difficulties that we can and must overcome -- our policy for the future is clear. It was summarized by President Nixon before the Congress on January 20, 1972:

"-- We will maintain a nuclear deterrent adequate to meet any threat to the security of the United States or of our allies.

"-- We will help other nations develop the capability of defending themselves.

"-- We will faithfully honor all of our treaty commitments.

"-- We will act to defend our interests whenever and wherever they are threatened any place in the world.

"-- But where our interests or our treaty commitments are not involved our role will be limited.

"-- We will not intervene militarily.

"-- But we will use our influence to prevent war.

"-- If war comes we will use our influence to try to stop it.

"-- Once war is over we will do our share in helping to bind up the wounds of those who have participated in it."

STRATEGIC ARMS LIMITATION TALKS

Chairman ELLENDER. Mr. Laird, as you will state later, your hope is that peace can be established and that the SALT talks will succeed. Some time ago did you not state that you didn't think that we could afford to agree on the SALT talks until we are sure that we are stronger than Russia? Is that statement correct?

Secretary LAIRD. No, that is not correct.

Chairman ELLENDER. What is the statement you made?

Secretary LAIRD. The statement I made was that if we were going to have any opportunity to succeed in the SALT talks we would have to carry on our negotiations from a position of sufficient military strength, that I felt if we took unilateral action before agreements were entered into that the opportunity to move toward arms limitation would diminish.

Chairman ELLENDER. Who is going to decide that feature of the program? We are certainly watching from every angle what the Russians are doing and our agreement to enter into SALT talk agreements will certainly rest on the proposition that we should be stronger than Russia. That is not your objective?

Secretary LAIRD. That is not our objective in the strategic field. I believe that most Americans are, perhaps, willing to accept a position of strategic parity. I am sure that most Americans are not willing to accept a position of strategic inferiority.

Chairman ELLENDER. I agree to that and I am just wondering who will decide that we are even? We are trying to outbuild Russia and Russia is trying to outbuild us.

Secretary LAIRD. There is no question that the momentum of the Soviet Union that was started sometime around 1965, has gone far beyond what any of us thought they would do in 1965, when the program started. My Defense report gives a number of examples of this, and I would like to insert them in the record at this point.

(The information follows:)

Developments in the Soviet threat have brought the strategic reality into sharper focus during the past year. The Soviet buildup is showing even greater momentum than I projected in last year's Defense Report:

The Y-class ballistic missile submarine force of the Soviet Union could be as large as our POLARIS/POSEIDON force by the end of next year, rather than in 1974 as I predicted last year.

The new Soviet supersonic dash bomber, the BACKFIRE, could be operational by the mid-1970s.

Nearly 100 new ICBM silo sites have been identified, for new or modified ICBM systems. The possibility of such a new deployment program was mentioned in my Defense Report last year.

Construction of the Moscow ABM system has resumed, and testing of an improved missile continues.

Ongoing Soviet naval ship construction programs include production of nuclear-powered torpedo attack and cruise-missile submarines, and at least one large new cruiser, armed with multiple missile systems.

New Soviet fighter aircraft, especially the high speed FOXBAT as well as the FLOGGER and FITTER B, are entering the inventory.

Two new Soviet tanks, one a light tank, and the other a new main battle tank are probably in production.

Russia Submarine Increase

Secretary Laird. Last year when I made my report to this committee I said that they could be equal to us in the *Polaris* type or the *Yankee* class submarines by 1974. In this statement I have had to modify that and we now believe they will be equal to us in 1973. They already have in being or under construction 42 or 43 of these submarines, [deleted].

I have had to modify my statement that I made before this committee last year regarding SSBN's. I was too conservative in that area.

Opportunity To Move From Competition to Limitation

Now I do believe that we have an opportunity in these SALT talks to move from arms competition to arms limitation in the strategic field. I think that we have a chance to arrive at some limitation in both the defensive and the offensive area. Now that does not mean there are going to be reductions. I think reductions will probably come about on down the line in these discussions. [Deleted.]

Mr. Chairman, I think it would be well to include in the record a portion of the President's foreign policy report that spells out the background and progress in the SALT talks.

(The material follows:)

Strategic Arms Limitation Talks (SALT)

From the beginning of this Administration, issues related to strategic arms limitations have been given the highest priority. I recognized that even a modest success in such an endeavor could break the pattern of seemingly endless and increasingly dangerous competition.

In order to have maximum flexibility in negotiations with the Soviet Union, we began our preparations for strategic arms talks with a systematic examination of the issues. By analyzing every combination of weapons systems that might conceivably be subject to limitation and by examining measures that could be used to verify compliance in any agreement, we developed a sound basis for moving negotiations in the direction most likely to lead to an equitable agreement. In the ensuing discussions with the Soviet Union, we were determined not to be restricted to a fixed position which would have to be renegotiated internally every time there was a change of position. It was anticipated that our new approach might forestall the early stalemates which had characterized previous arms control negotiations when opening positions inevitably differed.

We recognized that negotiations would be especially complicated because of the difficulty of establishing equivalence between Soviet and American weapon systems that differed not only in number but in characteristics and capabilities. Moreover, both nations were at different stages in key weapons programs.

-- The Soviet intercontinental ballistic missile arsenal had continued to grow while the U.S. had ceased deployment of ICBMs. In addition, American ICBMs consisted almost entirely of medium size missiles, while the USSR had deployed a variety of sizes. One Soviet system, the SS-9

ICBM, carried a much larger warhead and had no American counterpart. Although U.S. missiles were smaller, they were more sophisticated and had a capability for multiple independently targeted warheads. The larger Soviet missiles, however, had the capacity to carry a greater number of these warheads if developed along lines similar to our program.

-- The United States had not built ballistic missile submarines since 1967; the Soviet program, although begun later, was expanding at an accelerated rate in 1969.

-- In 1964 the USSR began deploying an anti-ballistic missile system to protect its capital; our Safeguard ABM program, begun only in 1969, was designed to protect our land-based retaliatory forces, to defend against attacks by a small number of missiles, and to protect against an accidental attack.

Thus, even an agreement in principle to limit certain strategic systems would have left open major questions of defining precise limits without creating an advantage for one side.

Despite these problems, the approaching strategic parity provided an opportunity to achieve an overall agreement that would yield no unilateral advantage and could contribute to a more stable strategic environment. For the first time it was possible to conceive of agreements reflecting a genuine balance.

Meticulous preparations enabled us to begin negotiations in November 1969 with an understanding of the full range of issues, and to move efficiently from preliminary explorations of strategic principles to concrete proposals.

By late 1970, several phases of negotiations had isolated the key differences.

-- We disagreed on the kinds of weapon systems that would be limited in an agreement. The U.S. preferred to cover all major strategic systems -- land and sea based ballistic missiles, heavy bombers, and anti-ballistic missiles; the USSR defined "strategic" to include certain U.S. air and naval deployments abroad, while excluding various systems of their own, including medium range missiles.

-- We had not been able to agree on an equitable basis for limiting individual offensive systems that differed in numbers or capabilities.

-- The scope of an initial agreement was undetermined. The USSR proposed that it limit defensive forces alone; the U.S. felt it must encompass both offensive and defensive forces.

These differences meant that negotiating a comprehensive agreement would be very complicated and necessarily time-consuming.

As negotiations entered their second year, the continuing buildup of Soviet strategic systems was of particular concern. During the first year of negotiations the Soviets had increased their total arsenal of intercontinental ballistic missile launchers by nearly one-fourth and submarine launchers by nearly one-half.

At that time, I concluded that four principles were fundamental to our position.

-- First, the strategic balance would be endangered if we limited defensive forces alone and left the offensive threat unconstrained. An essential objective of the negotiations would be defeated by unchecked deployments of offensive systems. For example, with only defensive forces limited by an agreement, the continued expansion of Soviet offensive forces, especially the large SS-9 ICBMs if armed with multiple warheads, could eventually give the USSR a capability for seriously threatening our land-based strategic forces.

-- Second, it would be dangerous if, while constraining offensive forces, strategic defenses were allowed to increase without limit. In

sufficient numbers and sophistication, ABM systems deployed to defend cities can reduce capabilities to retaliate. Thus, unlimited ABM expansion ultimately would force an offensive buildup.

-- Third, if we could not devise satisfactory formulas for limiting all major weapon systems, we should concentrate on those of primary importance in the strategic balance which if unchecked would become most threatening to overall strategic equilibrium.

-- Finally, if we could not find technical solutions for limiting systems that already differed in numbers and capabilities, an interim step might be a freeze at current levels on deployments of the most destabilizing offensive weapons.

These conclusions were the basis for my personal intervention with the Soviet leaders. Recognizing that only by establishing a political commitment at the highest level could we make significant progress on the range of technical issues that still confronted the negotiators, I attempted to create a new negotiating framework in which both sides could proceed. This overture, followed by several months of intensive negotiations, ultimately produced the breakthrough announced on May 20, 1971:

"The Governments of the United States and the Soviet Union, after reviewing the course of their talks on the limitation of strategic armaments, have agreed to concentrate this year on working out an agreement for the limitation of the deployment of anti-ballistic missiles systems (ABMs). They have also agreed that, together with concluding an agreement to limit ABMs, they will agree on certain measures with respect to the limitation of offensive strategic weapons.

"The two sides are taking this course in the conviction that it will create more favorable conditions for futher negotiations to limit all strategic arms. These negotiations will be actively pursued."

In essence, this new understanding involved elements that bridged the concerns of both sides:

-- An ABM agreement would have initial priority in further discussions. Since most progress had been made in this area, we would concentrate during the remainder of 1971 on negotiating an agreement on limiting defensive systems.

-- The essential linkage between agreements to limit offensive and defensive systems would be preserved, and the two agreements would be concluded simultaneously.

-- The impasse over the composition of strategic offensive weapons was resolved by concentrating on an initial agreement for those offensive systems having the major impact on the strategic balance.

The breakthrough on May 20 revitalized the negotiations. It was followed by progress in related areas. On September 30, 1971, the U.S. and USSR signed two agreements which had been worked out in parallel with the main arms negotiations.

-- The first established agreed measures that each side would adopt to reduce the risk of nuclear war occurring as a result of an accident or unauthorized acts.

-- The second provided that the direct communications link (Hot Line) between the U.S.-USSR would be made more secure and less vulnerable by employing satellites in the communications system.

These agreements demonstrated a mutual willingness to deal seriously with other strategic issues.

The exact scope of the agreements derived from the commitment of May 20 is still under negotiation, and I am obliged to protect the confidentiality of these talks. I can report that a consensus is developing on certain essential elements which provide a basis for further movement toward an agreement that accommodates concerns expressed by each side:

-- Comprehensive limitations should be placed on ABM systems. Deployments should neither provide a defense of the entire national territory nor threaten the overall strategic balance. However, reaching agreement has been complicated because the existing Soviet system is designed to protect Moscow in contrast with our initial ABM deployments which defend ICBMs located in less populous areas.

-- Since an ABM agreement will cover all aspects of limitations on ABM defensive systems, it should be a long term commitment formalized in a treaty.

-- There should be an interim solution to the question of offensive controls. Certain offensive weapons should be frozen to prevent widening of numerical differentials to a point which would necessitate additional American countermeasures. An interim agreement would not be as comprehensive as the ABM Treaty and further offensive limitations would be considered in a second phase of negotiations. Because it is only an interim measure, it is more appropriately concluded in a formal agreement of a different type.

-- An essential linkage between the substance and duration of the documents dealing with offensive and defensive aspects must be preserved.

The extent of the interim offensive agreement is still under intensive negotiation, reflecting the greater complexity of questions related to offensive systems. We must weigh the advantages of prolonging the current stage of negotiations in order to reach agreements on every offensive system against the consequences of allowing the current Soviet buildup to continue, perhaps for a considerable period. Considering the overall balance of offensive systems, including our program

of multiple warhead deployment, there will be no disadvantage for the U.S. in an interim freeze of certain systems. Moreover, Soviet willingness to limit the size of its offensive forces would reflect a desire for longer term solutions rather than unilateral efforts to achieve marginal advantages.

Achieving initial agreements to limit both offensive and defensive strategic programs will be a major step in constraining the strategic arms race without compromising the security of either side. On the other hand, if negotiations are protracted while the Soviets continue offensive missile deployments and development of new systems, the U.S. has no choice but to proceed with major new strategic programs. This is a reality of our competitive relationship. The SALT negotiations offer a constructive alternative to unlimited competition. I am confident that agreements limiting strategic arms are feasible and in the interests of both nations. Equitable agreements can only enhance mutual security. They would represent an enormous change in the course of our postwar competition.

Secretary LAIRD. We are not building any new submarines.

Chairman ELLENDER. We are now converting the Polaris submarines to Poseidon. But now you have the ULMS program which increases the size of that fleet with a submarine we were told would be larger [deleted] feet in diameter, and could cost over [deleted] dollars each, and the principal virtue of it is that it will have a missile with an extended range.

Secretary LAIRD. That is not the only virtue, Mr. Chairman.

Chairman ELLENDER. From our discussions with the Navy I got the impression that the principal advantage of the ULMS was that the increased range of the missile would increase the ocean area in which it could operate, thereby making the submarines more difficult to detect. The point was also made that this submarine could be operated from our own shores.

Mr. Secretary, do you think it is really necessary to proceed with this accelerated ULMS program?

Secretary LAIRD. Mr. Chairman, I believe it is necessary for us to go forward with the new strategic submarine program.

Chairman ELLENDER. Why?

Secretary LAIRD. I gave four basic reasons in the report and I would like to place those in the record at this point and just expand a bit in addition to the basic reasons.

(The information follows:)

The continuing Soviet strategic offensive force buildup, with its long term implications, convinced us that we need to undertake a major new strategic initiative. This step must signal to the Soviets and our allies that we have the will and the resources to maintain sufficient strategic forces in the face of a growing Soviet threat. It would be diplomatically and politically unacceptable for the U.S. to allow the Soviets to achieve a large numerical superiority in both land-based and sea-based strategic missiles. Moreover, there would be an increasing military risk that future technological advances in conjunction with much larger numbers of Soviet strategic missiles, might offset the qualitative improvements we are planning for our land-based strategic forces.

I have carefully reviewed all alternatives for new strategic initiatives and have decided that acceleration of the ULMS program is the most appropriate alternative, since the at sea portion of our sea-based strategic forces has the best long term prospect for high pre-launch survivability. The Navy assures me that this acceleration will permit deployment of the first ULMS submarine in 1978, at least 2-3 years earlier than would have been the case in the regular program.

In reaching this decision, we considered a range of alternatives, including further modification to existing submarines and construction of additional submarines using the basic design for the latest POSEIDON submarines. We concluded that acceleration of the ULMS development program was the best possible course of action available for several reasons including:

First: The ULMS program is already underway as a major development program. It therefore does not involve disruption of ongoing programs which already have high priority, such as the POSEIDON conversions and construction of nuclear attack submarines.

Second: ULMS offers the best technical program currently available to provide future sea-based strategic force capability. It makes the greatest use of new submarine quieting technology, and is capable of carrying a larger ballistic missile than can be fitted in existing submarines. The option to deploy this larger missile provides flexibility for increased range, and hence larger operating area at sea, or alternatively a capability to carry large, more advanced penetration payloads at less range, should this be desirable in the future.

Third: Deployment of ULMS, with a capability to carry a greater number of large missiles, means that a given nuclear payload can be deployed with fewer boats and crews.

Finally: The ULMS missile development program will permit an option to retrofit the shorter range ULMS I missile into POSEIDON submarines in the future, should that be desirable.

A total of $942 million is being requested for the ULMS program in FY 1973.

The ULMS program we are proposing will be discussed in further detail by other witnesses before the Congress. I am confident Congress will understand the need for accelerating the ULMS program, and will continue to provide this program the excellent support which it has received in the past.

SUPPLEMENTAL REQUEST: TIME REQUIREMENT FOR POLARIS FOLLOW-ON

Secretary LAIRD. We will not have our first submarines, even if you approve the supplemental request that is before your committee at the present time, until 1978. If you approve the supplemental we will be able to go forward with a design contract on the 1st of April. Admiral Rickover, Admiral Zumwalt, Admiral Smith, the Secretary of the Navy—they are in agreement that that would give us an opportunity to move up the completion date 2–3 years from what it was under last year's ULMS program if we proceed immediately in this area. We will be able to move forward, but the earliest time that we could have a new submarine would be in 1978. If we wait and don't go forward with this supplemental, then the earliest we could have this ULMS submarine would probably be in the late 1979 or 1980 time period.

RUSSIAN Y-CLASS SUBMARINE PROGRAM

Now the Soviet Union has built the world's most modern construction facilities for Polaris-type or *Y*-class submarine. [Deleted.]

[Deleted] or modify the *Y*-class for the SS–NX–8 missile. Now, in 1978, by the time we can complete our first ULMS, if the present rate of construction continues the Soviets could have 70 SSBN's operational. Their shipyards have the capacity to accommodate [deleted] hulls a year now; they are building at the rate of nine to 10 per year.

Chairman ELLENDER. Is that the *Y* class?

Secretary LAIRD. Yes.

Chairman ELLENDER. How does the *Y*-class submarine compare to our Polaris and Poseidon submarines?

Secretary LAIRD. Well, *Y*-class is similar to our original Polaris. [Deleted.] The *Y*-class carries a 1,300 nautical mile missile, and Polaris carries a missile with over 2,000 nautical mile range. I want to be fair in giving you all of the facts; there are certain advantages and certain disadvantages.

[Deleted.]

UNDERESTIMATE OF TIME REQUIRED FOR RUSSIA TO EQUAL U.S. CAPABILITY

The point I want to make, Mr. Chairman, [deleted.] The reason I suggested that we move up this date is because I had in all candor, to come to this committee and tell you that my estimate of last year that they could be equal to us in Polaris types by 1974—and I was criticized by some for saying that—but we now believe that estimate was conservative and that the date will be 1973. By the time we can have a first replacement or follow-on submarine, the Soviets could have at least 70 SSBN's operational if present construction rates continued.

Chairman ELLENDER. But their missile is not comparable to our Poseidon.

Secretary LAIRD. Mr. Chairman, I want you to know they have the capability to MIRV the missiles on the Y-class submarine.

Chairman ELLENDER. As we have done with the Poseidon.

Secretary LAIRD. Yes, but they will be able to have that capability deployed on the Y-class I believe, within [deleted]. We have a technological superiority in this area at the present time and there should be no question about that as far as the warheads that we are putting on our missiles, but the Soviet Union is going forward in this area. I hope, Mr. Chairman, that no one will make the mistake of believing that the

Soviet Union does not have the capability, the capacity, or the technical know-how to do this same thing on their particular systems. They can do it. We believe they are acquiring the necessary technology in their ICBM programs.

Chairman ELLENDER. You admit now that, with the Poseidon, it is much better than their Y-class submarine?

Secretary LAIRD. But their Y-class can be modified, and the missiles can be MIRVed just like the Poseidon's missiles are MIRVed.

Chairman ELLENDER. I understand that.

Secretary LAIRD. And they could have 70 boats, given the conditions I stated earlier and we will have 41.

ADVANTAGES OF NEW ULMS CONSTRUCTIONS VIS-A-VIS CONVERSIONS

Chairman ELLENDER. Why not build Poseidon submarines instead of ULMS?

Secretary LAIRD. Mr. Chairman, you know that is one of the suggestions that was made. I went through all the available options involving reconverting the Poseidons using the first 10 Polaris boats, making a conversion on them—and there are a number of different options. I am convinced beyond any doubt that the recommendation that I have made is the right recommendation and that we should not go forward with a retrofit program, but should pursue the ULMS program.

If you build more Poseidon-type submarines, it would take about the same length of time as it would to get ULMS, and I believe it is more important to have more longer range missiles so that we can home port these submarines within the United States. One of our problems in this situation is a problem that affects people. When we have to home port and place these submarines over in the United Kingdom or in Spain we have a problem with the crews and with family separation; this is a major problem.

I would rather have fewer boats in number with greater missile-carrying capability and longer range, as we look to the future, than to go back and build the kind of submarine we built in the past.

I think you have a valid question though on why we don't accelerate programs other than the ULM's and I would like to address that briefly.

(The information follows:)

It is not our intent to simply proliferate our forces so as to increase the number of weapons that would survive an attack. If we were to solve our problems in this manner, the Soviets could respond in turn and our relative positions would remain unchanged. Rather, we have chosen a course of action which, we believe, will provide us with the best chances of maintaining the long term security of our deterrent forces.

With respect to Minuteman, we are improving the survivability of that force by increasing silo hardness. This program has been time phased to meet a possible threat against Minuteman. The Safeguard and Site Defense programs are similarly time phased against greater and greater threats to Minuteman. At the moment, I do not believe that they need to be accelerated.

With respect to the B–1, we are conducting this program on a schedule that is time-phased with our need. In this case, our need stems from more subtle considerations as we approach the 1980's—for example, the aging of the B–52 force, the capability of the B–52 to escape an SLBM attack upon its home bases, and the continued capability of the B–52 to penetrate the enemy defenses. Consequently, we are pursuing the development of the B–1 now to provide us with an option for deployment of the B–1 in the late 1970's and early 1980's. Whether

we choose to deploy and at what rate will depend upon our assessment of conditions prevalent at that time and those postulated for the 1980's.

With respect to an acceleration of the Poseidon deployment, it should be recalled that this would require that a greater portion of the Polaris boats would be off alert now while these boats are converted to the Poseidon configuration. Our present conversion rate has been carefully balanced between the desire to quickly convert the force, the desire to retain sufficient numbers of Polaris submarines on patrol at any time, and the capacity of our shipyards for conversion and overhaul of our present nuclear submarines.

Senator PASTORE. But you have left out one thing—the mobility.

Secretary LAIRD. That is one of the major parts of the four points.

Senator PASTORE. First of all, ULMS as I understand it will be able to fire [deleted] miles against the new model which will go [deleted] miles.

Secretary LAIRD. The new missile the Soviets are testing has a range of about [deleted] nautical miles.

Senator PASTORE. And ours will be [deleted] which means you can home port them. It is a moving target so that they cannot hit it that easily. As a matter of fact, I mean it will help us in whatever missile gap there is.

Secretary LAIRD. It will help greatly in assuring the continued credibility of our strategic deterrent.

Chairman ELLENDER. Senator.

Senator PASTORE. Go ahead. I would like to pursue this when he gets through.

Chairman ELLENDER. I would, too.

TESTIMONY OF ADMIRAL ZUMWALT: U.S. CONVENTIONAL CAPACITY

Senator YOUNG. Mr. Chairman, I think the question raised by the chairman and Senator Pastore was quite apropos. Yesterday when Admiral Zumwalt testified before this committee he stated: "As I testified before this committee last year, I believe that [deleted].

Do you share that dim view of Admiral Zumwalt's?

Secretary LAIRD. No. I know the admiral likes to become Jimmie the Greek and quote odds, but I do not share that approach. I believe that, with the things that we are doing, we are capable of handling the challenge in 1972. I believe we have a realistic deterrent not only in the strategic field in 1972, but we also have a realistic deterrent in the theater nuclear field and in the conventional field. I believe that it is dangerous to give the impression to our allies and to the world that those particular odds are correct. I disagree with Admiral Zumwalt on that point and I am not going to become Jimmie the Greek as Secretary of Defense.

Senator PASTORE. Yes, but does that not put the Nation in an awful position?

Secretary LAIRD. I disagree with it.

Senator PASTORE. I know, but you have a commanding officer of the Navy who gives a picture which is very discouraging. It rocked us the way he said it.

Secretary LAIRD. To justify our budget in 1973 or our programs beyond 1973 with that kind of approach is wrong in my opinion, and as far as the justification on the budget is concerned it is not an approach that I would use.

Senator YOUNG. Mr. Chairman, could I ask a question?

Chairman ELLENDER. Yes, Senator Young.

Secretary LAIRD. I am not going to assume the worst of all possible situations in any testimony that I give this committee or any other committee of this Congress.

Senator YOUNG. I would like to ask a similar question of Admiral Moorer of the Joint Chiefs of Staff. Do you share this view and do you believe the Russians are moving ahead faster than we are in naval capability? And if they are, at what point would they become stronger than we?

Admiral MOORER. You have asked me several questions, sir. We look on this in terms of first, the strategic war and, second, the conventional war.

Senator YOUNG. I am talking about conventional.

STRATEGIC CAPABILITY

Admiral MOORER. With respect to the strategic war, first, as I say in my statement, we feel that we have adequate deterrence today. Our concern is about the momentum which is tending in effect to move the Soviets ahead. I will explain this in more detail in my statement.

CONVENTIONAL CAPABILITY UNITED STATES AND RUSSIAN NAVAL TASKS

With respect to a conventional war with the Soviets, I think that one must look at that in terms of a NATO war. If you are really going to have a large-scale ground war with the Soviets, the United States would not have that in isolation without our allies.

So far as the sea aspects of a conventional war with the Soviets are concerned, there is no question about the fact that the Soviets have built a very large number of submarines. This is because our Navy and their navy have two different types of tasks. The U.S. Navy's main task is to project our military power overseas, jointly with the Army and the Air Force, and at the same time, protect the seas. The Soviets, having seen us twice during this century use these seas to support our forces involved in a big war in Europe, have set about to build forces which can attack and interdict these lines of communication (LOC's). So my view is that due to the fact that they have these submarines, we would have to expect a very high rate of attrition of ships manning these LOC's during a large-scale conventional war with the Soviets.

U.S. MOBILIZATION AND SHIP REPLACEMENT CAPABILITIES

Consequently, the question boils down to our mobilization capacity, the rate at which we build replacement ships and the rate at which we sink the hostile submarines. [Deleted.] I will say that due to the submarines that they have we will have a high attrition against our ships that are manning these LOC's.

Senator YOUNG. At the rate that Russia is improving her naval capability, is there a possibility that in 2 or 3 years they would have a greater strength than we and could possibly defeat us in a conventional naval war?

Admiral MOORER. As you may recall, during the 1967–68 period, when I was Chief of Naval Operations I was very unsuccessful in getting approval of shipbuilding programs. I believe, in 1969 our

new obligational authority for SCN was less than a billion dollars, which is the lowest shipbuilding program we have had since World War II. So, the ships that are coming into the inventory right now are the result of the decisions that were made at that time. Subsequent to that time the budget for ship construction; namely, the SCN budget, has risen significantly. Consequently, the impact of last year's budget and this year's budget will be felt in 1974 and 1975 on the Navy's modernization, which was allowed to dip during those years. When we get this new equipment, I think that this will provide a counter to the Soviet buildup. It is true that the Soviets are moving ahead in all categories of weapons at a faster rate as of today than we are. This is why both the Secretary of Defense and I are recommending strongly that we take actions now and take into consideration the long leadtime involved so that we will not fall behind in the late 1970's and 1980's.

FUNDING REQUISITE

Senator YOUNG. Your calculation then is based largely on approval of Congress of your present request?

Admiral MOORER. Yes, sir, it is; and I think that these programs are vitally necessary if we are going to prevent a situation developing which would put us in a position of inferiority.

PITTING OF CAPABILITIES

Chairman ELLENDER. Are you guessing that we are going to have a land war?

Admiral MOORER. No, sir, I am not guessing anything.

Chairman ELLENDER. I presume you picture Europe as the battlefield in the event we do have a land war?

Admiral MOORER. I am dealing with capabilities, sir.

Chairman ELLENDER. Is it the capability of the Soviet submarines to attack our fleet and our freighters when they are carrying supplies to our allies in Western Europe?

Admiral MOORER. They would attack our ships in any ocean, including those ships coming to the United States with raw materials.

Chairman ELLENDER. But your primary reason for saying what you have just stated is that you anticipate a conventional land war?

Admiral MOORER. I do not; no, sir. That is not what I am saying. I wanted to emphasize that any war with the Soviets could not be fought in isolation, just between the United States and USSR.

Secretary LAIRD. We are not trying to fight wars; we are trying to prevent wars with our national security strategy of realistic deterrence.

Chairman ELLENDER. We are living now in a missile age and, as I said 20 years ago, since we are living in a missile age, we ought to prepare the best kind of missiles available for our protection.

RUSSIAN SUBMARINE CAPABILITIES

Admiral MOORER. Mr. Chairman, all I am saying about the conventional war at sea is that the Soviets have several hundred submarines, and as of this day there are several thousand ships on the ocean.

Chairman ELLENDER. What are those submarines going to be used for?

Admiral MOORER. They have three kinds of capabilities. One is to fire ballistic missiles that have nuclear warheads.

Chairman ELLENDER. And we are ahead of them in that.

Admiral MOORER. Another is to fire cruise missiles. And the third is to fire torpedoes at surface ships.

Chairman ELLENDER. That is right.

Admiral MOORER. There are two distinct types of submarines, and I am going to describe them to you in my statement.

U.S. PRESENT SUPERIORITY AND RUSSIAN EARLY EQUALIZATION

Chairman ELLENDER. Insofar as the Y-class is concerned, they are behind us. The Poseidon is much better than theirs.

Admiral MOORER. You are talking about quality, as opposed to quantity.

Chairman ELLENDER. Even quantity in the Y-class; I understand we have more Poseidons and Polaris than they have. You compare their Y-class to our Polaris, don't you?

Admiral MOORER. Yes, sir.

Chairman ELLENDER. Whereas we have the Poseidon class. Aren't we ahead of Russia——

Secretary LAIRD. There is no question we are ahead, Mr. Chairman. I have said that we now have operational a greater number than the Soviet Union has.

Chairman ELLENDER. Surely.

Secretary LAIRD. They will equal our number operational in 1973. I have had to change the estimate this year from 1974 to 1973. There is no question we have made improvements with the funds that have been made available by this Congress. Now if you want me to list the improvements, I will.

TESTIMONY INADVISABILITY

In answer to Senator Young's question, I know that it is easy for someone to come in and take over the responsibility for one of our services and be critical of what has gone on in the past. The things that he is being critical of didn't happen while I was Secretary of Defense, by the way, because of the 4 to 5 or more years leadtime it takes before you get ships that are under construction, into the inventory. I don't believe that approach is the best approach to take as far as the American people or this Congress are concerned, because that is not the kind of scare technique you use in order to get sufficient national security resources in order to protect the safety of our people and to prevent war.

Senator PASTORE. You are not questioning the sincerity of his conviction? I would like to follow this through.

Secretary LAIRD. I am saying that I believe it is the wrong approach.

[Deleted.]

NEW YORK TIMES ARTICLE BY MR. SCOVILLE: STRATEGIC ARMS LIMITATION TALKS

Senator PASTORE. Are you familiar with Scoville's article in the New York Times today?

Secretary LAIRD. No, I am not.

Senator PASTORE. Well, strategic limitation discourages war and I will tell you very frankly the frightening thing [deleted].

Secretary LAIRD. [Deleted.]

Senator PASTORE. Absolutely. The fact is that what we are forgetting here in America is that we have prevented an atomic war in the last 25 years and the only reason why we have done it is that we have had the determined power. If we didn't have the power, we might have found ourselves in certain situations where maybe we would not have been able to tell them to take the atomic bombs off Cuba, as we did in 1962, and that is being forgotten.

Now Scoville's argument goes back to the question over why do we do all these things if we are in the limitation talks. I am a little surprised for you to say here this morning, Mel, that you have so much confidence that we are going to reach an agreement. I myself think we are beginning to be hoodwinked. We are beginning to be hoodwinked because they are working as fast as they can to increase their military posture. They are going to equal us and maybe they are going to pass us in a short time and we are standing still, hoping that we will reach some foolish agreement.

Secretary LAIRD. We are not standing still in this budget, Mr. Chairman and Senator Pastore. We are not standing still and that is the point that I want to make here. That is why I put this great urgency on ULMS, that is why I increased the number of attack submarines proposed in the budget each year, that is why I asked for this increased budget authority in this budget.

U.S. NUCLEAR SUBMARINES

Senator PASTORE. How many nuclear subs do we have under construction?

Secretary LAIRD. Well, at the present time we are working on a total of 23. This includes 10 SSN–637 class, one SSN–685 (turbine-electric drive submarine) and 12 SSN–688 class submarines.

Chairman ELLENDER. What total will that give us vis-a-vis the Russians by 1972?

Secretary LAIRD. When I first came into office the budget included funds for only three attack submarines. I recommended an increase to four in fiscal 1971, the first year, an increase to five last year, and an increase to six this year as far as the nuclear powered attack submarines are concerned. I hope the Congress will approve this latest increase in that building rate. Given the period of time it takes for submarines to come into the inventory, you would have had to have made the appropriations for those back in 1967 and 1966 in order for them to come into inventory in 1972 and 1973.

The chairman's statement gives his assessment of the capabilities of each country. It includes a chart showing the number of attack submarines the Soviets and Chinese have and the number that we have. That information appears on chart 11 of his unclassified statement. I would like to put that chart in the record at this point.

(The chart referred to follows:)

ATTACK SUBMARINES

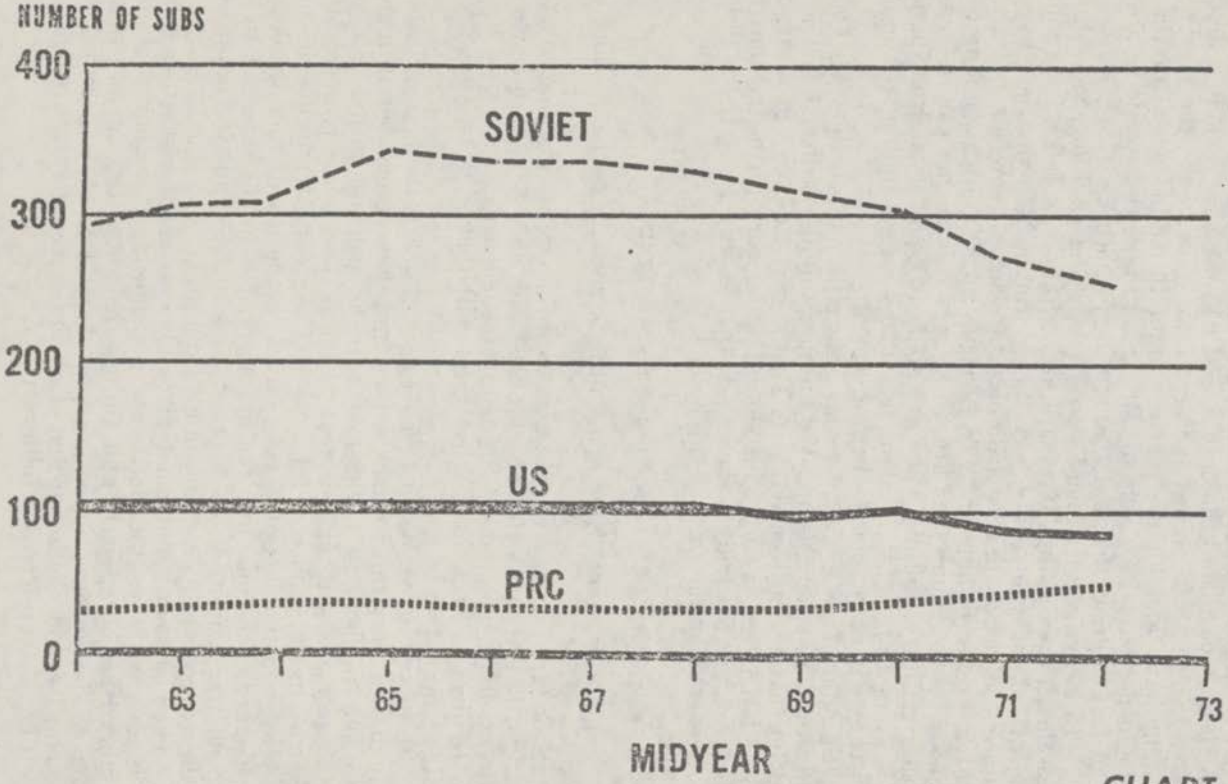


CHART NO 11

CONSTRUCTION ACCELERATION

Chairman ELLENDER. Mr. Secretary, what I was discussing a while ago was the feasibility and the necessity of going into what is more or less a crash program on ULMS.

Secretary LAIRD. I am not advocating a crash program, Mr. Chairman.

Chairman ELLENDER. No, but the amount of money you are asking——

Secretary LAIRD (continuing). But we are proposing to accelerate the program. Last year this committee approved——

Chairman ELLENDER. But limited to development.

Secretary LAIRD. Research and development, yes.

Chairman ELLENDER. I don't see how your R. & D. program could be far enough along to justify the accelerated program you are requesting in the fiscal 1973 budget.

Secretary LAIRD. If you approve the $35 million proposed supplemental we will be able to step up the ULMS program.

ULMS AND OTHER NUCLEAR SUBMARINE CAPABILITY VIS-A-VIS LAND-BASED MISSILES

Chairman ELLENDER. The point that I am trying to stress is this. You acknowledge, and it has been acknowledged by others, that the Y submarine of the Russians is not as capable as ours from many standpoints. You compare the Y to our Polaris, but we also possess the Poseidon. Now you want to go into the ULMS program which will cost, as I understood from the witness yesterday, [deleted] per submarine. Those submarines will carry from 20 to 24 missiles in contrast to the present number of 16. What required capability will we get from ULMS that we do not now have in the Poseidon system?

Secretary LAIRD. It would have a greater operating area, and long enough range missile to operate out of the United States. I think that would add to our deterrent capability.

Chairman ELLENDER. Again you are stressing the extended range of the ULMS missile. How about our long range land-based Minuteman II's and III's?

Secretary LAIRD. Mr. Chairman, as you know the Soviet Union's position on land-based missiles, is that they are already 500 ahead of us.

Chairman ELLENDER. All right. Let us analyze that.

Secretary LAIRD. I am not recommending to this committee that we go forward with more land-based missiles at this time.

Chairman ELLENDER. Why?

Secretary LAIRD. Because I believe that the submarine-launched missile program will give us a greater deterrent capability. It has a greater invulnerability than going forward with an increase in the land-based missiles at this time. I know that you have always felt we should go forward with more land-based missiles. I believe we should keep the land-based missile force at its current level and that any increase should be in the sea-based missile systems.

Chairman ELLENDER. When was that decision made?

Secretary LAIRD. I made that decision and recommended it to the President.

Chairman ELLENDER. Recently?

Secretary LAIRD. In this budget.

Chairman ELLENDER. And in the supplemental?

Secretary LAIRD. And in the supplemental. We are recommending that we go forward with the follow-on submarine program in this budget.

PROPOSED ULMS PROGRAM

Chairman ELLENDER. Your ULMS program can't become operative until 1977, even if you initiate a crash program.

Secretary LAIRD. It is scheduled for 1978 in our currently proposed program. If you went forward with the construction of new Poseidon-type submarines, they would be available in the same time frame.

Chairman ELLENDER. The ULMS submarine, will cost a [deleted] dollars apiece, although my guess is it will be more than that.

Secretary LAIRD. I understand that it was justified yesterday to the [deleted] dollar figure for missiles and submarine.

Chairman ELLENDER. And you propose to build at least [deleted]. Am I right in that?

Secretary LAIRD. The ultimate force level has not been decided, but in the current 5-year program we are talking about procurement of [deleted].

Chairman ELLENDER. The estimate is [deleted], but history tells us that cost inevitably accelerates.

Secretary LAIRD. I didn't say that. I understand the testimony yesterday was [deleted] for the submarine and missiles.

Chairman ELLENDER. That is right.

Secretary LAIRD. What we are asking for in ship construction funding for ULMS boats is $394.5 million. We are also asking for $520.4 million in R.D.T. & E., and $27.3 million for military construction. That is what we are asking for in fiscal year 1973.

Chairman ELLENDER. I understand that, but ultimately, when you decide to construct them, the cost of each will be about [deleted] dollars.

Secretary LAIRD. The estimated total program cost for [deleted] boats according to the Navy, is [deleted] billion in constant fiscal year 1972 dollars. In then-year dollars, the Navy's current estimate for total program cost of [deleted] boats is [deleted] billion. The first ULM's boat under this program would not be available until 1978. No firm decision has yet been made on the eventual ULMS force level.

1972 SUPPLEMENTAL

Chairman ELLENDER. Why are you requesting $35 million in the fiscal year 1972 supplemental for ULMS?

Secretary LAIRD. As for the $35 million supplemental that we are requesting for fiscal year 1972, I felt I had to submit that to the Congress as a supplemental rather than through the reprograming route. One reason is that the money in our emergency fund has already been earmarked for other purposes, and, in addition to that, I felt it required congressional approval before we went forward beyond research and development in this program.

I think it would be well if we included my statement on the requested fiscal year 1972 supplemental at this point in the record, because it explains this in greater detail.

Chairman ELLENDER. The statement will appear at this point in the record.

(The statement follows:)

I am appearing before you today to discuss the additional Department of Defense programs for fiscal year 1972 which are included in our supplemental request. As you know, our supplemental request is included in the President's budget for fiscal year 1973.

We are requesting a supplemental totaling $141 million in RDT&E and $113.8 million in procurement funds. These funds will be used for programs that we need to start now to meet defense requirements as a result of the Soviet weapons momentum, to assure command and control capabilities, to improve our technology base in key areas, to increase operational test and evaluation, and to reduce the high costs of buying and maintaining our weapons systems. Other members of my staff, as well as representatives of the Services, will be providing you with the details of this request. But I believe it would be appropriate to provide the Committee with pertinent information on the origin of this request.

Two years ago when I appeared before this Committee to present our budget for FY 1971, I indicated that we were deferring some hard decisions on new weapons development and deployment programs until we could get a clearer picture of the precise direction and momentum of the Soviet threat and the progress of the Strategic Arms Limitation Talks (SALT). We took this action to retain as great a degree of flexibility in our planning as possible. At that time I said also that we would have to face up to some extremely difficult decisions within 12 to 18 months, if we did not reach a SALT agreement or if the rapid momentum of Soviet weapons programs did not diminish.

So last year when I presented my Defense Report to this Committee, I said that we could no longer defer some of these hard

decisions in the strategic weapons area. That is why we decided to push forward with prototype development of the B-1 strategic bomber and the Undersea Long Range Missile System (ULMS), and requested funds for these two programs at the optimum level consistent with good management.

I have frequently stated, both to this Committee and in other forums, that I would not hesitate to recommend any additional funding that might be required to insure the continued safety and security of the American people.

We have carefully examined our requirements and have included only essential items that could not await the availability of FY 1973 funds. Furthermore, we have taken close cognizance of the concern expressed by the Congress in the FY 1972 Authorization and Appropriation Acts that we should emphasize prototypes and test and evaluation in our future developmental programs.

Most of the projects included in this supplemental request have been reviewed, and authorized by this Committee. We are asking for your support for the accelerated progress of these projects within amounts already authorized for appropriation during FY 1972. We are providing a separate table which identifies the source of authorization for the requested supplemental appropriation.

Turning now to specifics of the request, the Advanced Airborne Command Post (AABNCP) is an urgent program if we are to retain a credible and realistic deterrent in the future. Nearly half of the funding requested in the supplemental will be used for this system. The growing threat from Soviet strategic forces makes early improvements to our national command and control system imperative. The most critical need is for a survivable, enduring command post.

Our studies have convinced us that the best solution to this problem for the foreseeable future is to go airborne with adequate command, control and communications facilities on board.

Our current airborne command system is severely deficient in survivability and capacity and cannot fulfill our essential needs in the event of nuclear attack on our country. It lacks the survivable secure communications needed for control and execution of the forces, the long endurance, the space for sufficient high level staff to support the President, and the space for the battle staff and equipments which provide the information needed to make decisions.

Earliest possible correction of deficiencies is essential. We believe that by moving vigorously now we can greatly improve our command and control posture by early 1975. To achieve this goal, the first steps are to acquire aircraft with the size and endurance needed and to initiate acquisition of the new on board facilities.

To perform the command and control job, a total fleet of seven AABNCP aircraft is needed. We are requesting $113.8 million in FY 1972 to purchase the first four Boeing 747 aircraft. Our present plan is to purchase two more aircraft in FY 1973 and one aircraft in 1974 to achieve early correction of our deficiencies. The initial aircraft will provide some important improvements in our capability by 1973. Three of these first four aircraft will use the existing EC-135 electronic equipment and the fourth will be used for a special Electromagnetic Pulse Test Program and as a test bed for the development and operational testing of those new equipments which will be needed. By providing a larger, more capable aircraft, even with the present electronic equipment, we will be able to obtain greater

endurance, more flexibility, larger battle staffs, a larger group of varied experts to support top level decision making, and additional space to put improved communications and automatic data processing as it becomes available.

The requested supplemental includes $89.4 million in RDT&E to meet potential near-term Soviet threats posed by their upgraded ICBM force, cruise missiles, surface-to-air missiles, ballistic missile defenses, and anti-submarine warfare systems. Funding is requested for a number of projects, including the Undersea Long-Range Missile System (ULMS), EF-111 aircraft, the new Advanced Airborne Command Post aircraft, Advanced Ballistic Re-entry Systems, Advanced Ocean Surveillance System and an Advanced Cruise Missile.

Since the preparation of the FY 1972 budget, former Deputy Secretary Packard and I have given strong policy and procedural direction regarding the implementation of Blue Ribbon Defense Panel recommendations on improving the ability of the Department of Defense to conduct operational test and evaluation. This request includes $23.0 million for this purpose in projects such as an electromagnetic pulse simulator, test instrumentation, helicopter gunship test and evaluation, and Laser countermeasures testing, and accelerated initial operational test and evaluation of a "close-in" weapon system designed to protect our surface ships from the cruise missile threat.

The upgrading of the Soviet strategic forces and the consequent re-evaluation of the possible vulnerabilities of our own forces has led to considerable concern over the effects of electromagnetic pulses (EMP) produced by large nuclear explosions. Three items in this supplemental RDT&E request address this problem. The first item is included in the design of the advanced airborne command post. The

second request is for $4.0 million to initiate an EMP simulator of sufficient size to test adequately avionics in full size aircraft at close to the EMP threat level. The third is for $10.0 million, half of which is in the Air Force estimate and the remainder in the Defense Nuclear Agency estimate to determine, through testing, EMP hardness design criteria for specific command, control, and communications components. The results will also have direct bearing on B-1, AWACS, other aircraft, and ground installations.

The high unit costs and high maintenance costs of some defense equipment is a subject of concern. One method of reducing these costs is to simplify some of the more complex subsystems of total weapon systems. Three programs in this request are tailored to this approach, the M60A1 Tank Product Improvement, a Maintenance/ Reliability program, and an Advanced STOL Transport. A total of $15.6 million is included in the request for these programs.

Our ability to meet future threats to our national security rests squarely on the strength and superiority of our technological base. Included in this request is $13.0 million for projects which will help to advance technologies in areas that we know are vital to our security over the long run. Projects in this category include a cannon launched guided projectile, electronic warfare equipment and advanced VTOL technology.

ESTIMATED SUBMARINE COSTS

Chairman ELLENDER. Mr. Secretary, would you provide for the record the estimated cost per submarine of the various alternatives that are open to the Department of Defense? I would hope you would include the conversion of existing Poseidon submarines to carry an increased number of launch tubes, the conversion of 688-class submarines, and the construction of a new Poseidon and a new ULMS class submarine.

Secretary LAIRD. I would be glad to provide the information, Mr. Chairman.

(The information follows:)

Estimated cost per submarine unit procurement cost[1]

(SCN only—excludes missile costs)

[In millions of dollars]

Alternative:

1. Conversion of existing Poseidon SSBN's to carry 24 launch tubes vice 16. ("Stretched" Poseidon)---------- [Deleted.]
2. Conversion of 688 class nuclear attack submarines to carry 24 Poseidon or ULMS I missiles---------- [Deleted.]
3. Construction of new 640 class Poseidon SSBN's with 24 launch tubes ---------- [Deleted.]
4. Construction of new ULMS class submarines (can carry ULMS I and ULMS II)---------- [Deleted.]

[1] To place all costs in a similar reference frame, the figures cited are the follow-on shipbuilding and conversion costs of procuring (or modifying in the case of alternatives 1. and 2.) new units today. They do not include R. & D. or facility costs. The figures shown for each alternative reflect estimated costs in then-year dollars, with comparable costs in constant 1972 dollars shown in parentheses.

ULMS MISSILES

Chairman ELLENDER. Will the first ULMS submarines deployed have the existing Poseidon missile, or a new missile?

Secretary LAIRD. We are going to put a different kind of missile system on it, a longer range missile. The ULMS–I missile will be a different system than the ULMS–II, but I will be glad to put in those costs.

[Colloquy deleted.]

Secretary LAIRD. A discussion of megatonnage would simply show that the Soviet Union far outstrips us in megatonnage.

Chairman ELLENDER. Those are land-based missiles you refer to?

Secretary LAIRD. All missile systems.

ULMS AND ANTIBALLISTIC MISSILES STRATEGIC ARMS LIMITATION TALKS

Senator YOUNG. Mr. Secretary, the ULMS and ABM have some similarity in giving us a second strike capability or a deterrent. If we didn't have the money to finance both of them, would it be better to go ahead with the ULMS and not expand further the ABM? It would become a question of money. I know you probably prefer both, but which would provide the greatest deterrent?

Secretary LAIRD. The ABM system is very important in giving additional protection to the second strike retaliatory capability we have in our land-based missile systems.

Senator YOUNG. It is a question of how far you go with the ABM.
Secretary LAIRD. Yes.
Senator YOUNG. We didn't ask for it, we didn't object.
Secretary LAIRD. Well, of course these are matters that we are going into in the SALT talks. I think that there is an opportunity in the SALT discussions to arrive at some limitations in these areas. Now those limitations will [deleted].
[Colloquy deleted.]
Secretary LAIRD. Well, I don't believe that the Soviet Union is stronger than we are in the strategic area. I believe that we have a sufficient deterrent today and therefore, the use of nuclear weapons at this time is an unlikely possibility. I am concerned about the years 1975, 1976, 1977, and you have to be planning for that period of time. I disagree with Admiral Zumwalt's assessment that he gave to you yesterday.

EFFECT OF POSSIBLE ARMS LIMITATION AGREEMENT

Chairman ELLENDER. Mr. Secretary, all of these new strategic systems are costly, as you know better than I. I do not believe we can continue to engage in this weapons race with the Soviet Union and maintain a sound economy in this country. I think that it is imperative that we enter into some type of agreement to limit strategic offensive and defense weapons.
Secretary LAIRD. Mr. Chairman, we are moving from an arms competition into arms limitation, and I think it is most important that we do so. There is no department in this Government that is more interested in that than the Department of Defense.
Chairman ELLENDER. You say we are moving toward arms limitations, but you are requesting near $1 billion to accelerate the development and deployment of the very expensive ULMS system.
Secretary LAIRD. Mr. Chairman, I can assure you that if any agreement that is entered into that provides for limitations or reductions in the construction programs of these particular submarines, we will of course, abide by those limitations. My only point, Mr. Chairman, is that we have not reached the agreement yet.

PRIOR DECISIONS

Chairman ELLENDER. With respect to the assessment given to the committee by Admiral Zumwalt, when were the decisions made which are the basis for this assessment?
Secretary LAIRD. If there is any substance to what Admiral Zumwalt said—and I do not go back and criticize my predecessors in this job, or former administrations, because I don't think it serves any purpose—if you talk about where we are now in the conventional field—in the naval field and the air field—and in the strategic field, the decisions as to where we are with our deterrent force now were made back in the 1960's, they were not made during 1969, 1970, 1971 or 1972.
I believe that we did have a period there when great emphasis was given to the military expenditures in Vietnam, and it did have an effect upon our deterrent. Even taking into account those decisions of the past, which were approved by this Congress I do feel that we have a realistic deterrent in this year 1972 in all three areas.

My concern is not about 1972. My concern is about the future in the event some limitation agreement is not arrived at with the Soviet Union, and I hope and pray that we can move from competition to limitation. In connection with that, I would like to put in the record a comparison that shows force effectiveness increases in the past year in our forces.

Chairman ELLENDER. I join you, Mr. Secretary.

(The comparison follows:)

STRATEGIC FORCE/EFFECTIVENESS INCREASES

At the end of FY 71 the U.S. had 4,700 warheads available as compared to 5,700 by the end of FY 72. This arises from an increase in SSBN conversions from a force of 3 Poseidons in 1971 to 10 by the end of 1972. (Each Poseidon carries 16 launchers with multiple warheads (MIRVs) on each launcher.) In this same period Minuteman I to Minuteman (MM) III conversions have increased from 110 MM III in 1971 to [deleted] MM III in 1972. The Minuteman III has a MIRV capability whereas the MM I only carried one re-entry vehicle on each missile. The Short Range Attack Missile (SRAM), a standoff weapon for the bomber force, has begun to enter the inventory this year and by the end of FY 72 over [deleted] missiles will have been delivered.

STRATEGIC DEFENSIVE FORCE/EFFECTIVENESS INCREASES

A long range radar added to the SLBM detection and radar warning net along the East Coast.

Satellite early warning system attained interim capability [deleted].

Satellite basing has increased by one base (from 12 to 13); three other interior bases have been augmented for increased alert capability.

We have gone from 15 minutes ground alert to airborne alert (100% in the Atlantic and 50% in the Pacific) for the TACAMO force thereby increasing the survivability of communications to our Fleet Ballistic Missile Force.

Initial deployments for a new generation communications satellite system (DSCS II) were made. We expect this system to increase our communications capability worldwide when it becomes fully operational.

LAND FORCE/EFFECTIVENESS INCREASES

TOW Anti-Tank Guided Missile—We have added about [deleted] launchers and [deleted] missiles to our TOW Anti-Tank Guided inventory during the past twelve months. These items were mainly distributed to our Europe deployed and oriented forces. This represents nearly a doubling of our TOW inventory, and brings us to about [deleted] of our present acquisition objective for the TOW system.

M60A1 product improvement program.—This program is continuing on schedule. During the past twelve months, add-on stabilization was incorporated into about [deleted] M60A1 tanks. These were the first tanks to be modified in this way, and are in essence the first of the family to be substantially improved from a firepower standpoint. The capability to shoot and track on the move is essential if our M60A1 fleet is to be a match for the Soviet tank armies. The product improvement program will continue, of course, and our entire fleet will eventually be stabilized. Also, improved computers, rangefinders and suspension systems are being planned for retrofit application beginning in FY 74.

M551 Sheridan deployment.—About [deleted] Sheridans have been deployed to Europe as interim replacements for some of our M114 armored reconnaissance scout vehicles (ARSV), pending availability of a new ARSV. This action greatly increases our Europe deployed anti-tank capability.

LVTP7 amphibious assault vehicle.—During the last 12 months, the Marine Corps added the first 90 out of a planned 942 LVTP7s to the inventory.

Transport helicopter (UH–1Ns).—The Marines added 38 UH–1Ns to the inventory during the past year. This helicopter is a twin engine version of the Army's UH–1.

Army helicopters.—The Army added the following helicopters to the inventory during the past twelve months:

UH–1H (utility helicopter)	500
AH–1Cr (Cobra gunship)	87
CH–58 (observation)	600

Army equipment to Reserves.—In line with total force planning, Army reserve components received about $1 billion worth of equipment during the past twelve months. While some of this was new equipment, much was rebuilt via the Depot Maintenance Program.

NAVAL FORCE/EFFECTIVENESS INCREASES

Between March 1, 1971, and February 29, 1972, the Navy took delivery of 13 ASW escorts of the DE 1052 Class. They will add significantly to the fleet's ability to defend sea lines of communication to our allies in both the Atlantic and Pacific theaters. Also in the past year, the Navy received [deleted] P-3C patrol aircraft to be used from land bases in area search for enemy submarines. These are highly capable ASW platforms, as they carry the latest sensors and processing equipment available for procurement.

Improved weapons and sensors have also been added. The patrol air ASW force has recently completed fleet-wide introduction of the DIMAR sonoboy, which was developed in the late 1960s and has significant potential localization of enemy submarines detected by other sensors. Last month the MK-48 torpedo was carried for the first time by an attack submarine [deleted]. This weapon is a great improvement over the current ASW torpedo carried by our submarines.

Finally, reports from the 6th Fleet operating in the Mediterranean Sea, which as you know is an area of tension and potential confrontation with the Soviet Navy, indicate some encouraging trends in this regard. The 6th Fleet reports that general readiness increased measurably during calendar year 1971, primarily as a result of larger amounts of equipment and spare parts on hand, better operating condition of equipment, and improved training of ship crews.

ULMS AND POSEIDON SUBMARINE COSTS

Chairman ELLENDER. Mr. Secretary, I would like to be able to compare the cost of the ULMS submarine with the cost of a new submarine constructed for the existing Poseidon missile. I wish you would provide for the record a statement on the comparative costs of these two submarine types.

Secretary LAIRD. I will be glad to furnish that information Mr. Chairman.

(The information follows:)

The costs of constructing and outfitting submarines, including shipboard components of the weapon system, but not including missiles, is estimated below, in then-year dollars for the alternatives of interest. Estimates of comparable costs in 1972 dollars are shown in parentheses.

Alternative [1]	Cost	
	Lead ship	Follow-on ships
Poseidon submarine built with today's technology, with 16 tubes	[Deleted.]	
With 24 tubes		
ULMS submarine with 24 tubes as now planned		

[1] Alternatives assume building/funding schedules for 10 ship programs similar to ULMS schedules.

The actual average cost of constructing a Polaris submarine in the 1964 time frame was about [deleted] million. This figure must be escalated for cost increases experienced in the time frame 1964–1972 to be comparable. It should be noted, however, that many components for these ships are no longer being manufactured and the escalated cost estimate would therefore require adjustment to reflect some redesign and start up costs associated with the unavailable components. The average cost of converting one of the original Polaris ships to Poseidon capability is [deleted] million, including concurrent overhaul and refueling costs.

Chairman ELLENDER. Senator Allott.

Senator ALLOTT. I want to be sure that we are talking about the same thing. We have not built any Poseidon submarines, but are converting 31 at a cost of approximately $150 million apiece, Mr. Chairman. I want to be sure of what we are talking about in this request. Is the Secretary asking for the amount of money it would take to build a new Poseidon submarine now? If he is, that is one figure. If we are taking the original investment costs in your Polaris and adding on $150 million for a conversion, that is another figure. Now which are we talking about and which do you understand he is talking about?

Secretary LAIRD. I understand now that he wants to know the cost of starting from scratch and building a new Poseidon submarine.

Senator ALLOTT. There is going to be a tremendous amount of difference in those two figures.

Secretary LAIRD. Yes.

Senator ALLOTT. That is the only reason I am pointing it out.

Secretary LAIRD. Quite a difference. Even to build our attack submarines that are requested in this budget, comes close to $200 million per ship.

Admiral MOORER. May I make one comment? I am still a little confused.

Senator ALLOTT. That is the reason I am trying to straighten it out.

Admiral MOORER. You can take the plans we have today and make an exact copy of the Poseidon submarine, using the old techniques that were developed back in the early 1960's, the old sonars, the old equipment, and the old nuclear powerplant; or you can take advantage of the significant progress that has been made in acquiring new technology and build what amounts to a modern Poseidon. So, there are really three versions that you are talking about here. It would be foolish, in my view, to build a submarine for 1978 and force into it 1960 technology.

Senator YOUNG (presiding). I think, Senator Allott, you would like to have the best Poseidon you could put in operation.

Senator ALLOTT. I don't care what figures they give, I am just trying to pin it down so that when the record comes out it is not all fuzzy and the costs they give particularly delineate what you are costing out, that is all.

Mr. WOODRUFF. The point was made with the Navy yesterday that if you didn't go ahead with the ULMS, you would have to build new Poseidon submarines to replace the original Polaris submarine. So it would be a submarine using today's technology and the Poseidon missile system installed in it. That is what the chairman wants to compare to the cost of the ULMS.

Senator ALLOTT. Yes.

Secretary LAIRD. He does not want a Chinese copy.

Mr. WOODRUFF. No.

Admiral MOORER. Big difference.

Senator YOUNG. Could you not put both prices in the record?

Secretary LAIRD. There has been great improvement in submarine design since 1960. I would not recommend that we build new submarines with 1950- and 1960-type technology, but if the Congress in

its wisdom feels it is better to use the 1950 and 1960 technology in submarine construction, I would abide by that decision.

Senator YOUNG. I think you should put the figures in that the chairman had in mind, Mr. Secretary.

Secretary LAIRD. We will.

Senator YOUNG. And what the new modern ones would cost.

Secretary LAIRD. And we will put in today's cost rather than 1960 costs.

Senator YOUNG. Senator Allott, do you have more questions?

Senator ALLOTT. No.

Senator YOUNG. Senator Cotton.

Senator COTTON. No.

Senator YOUNG. Senator Case?

Senator CASE. I think I will defer, Mr. Chairman.

STRATEGIC, POLITICAL, FISCAL, AND MANPOWER REALITIES: ADMINISTRATION POLICY CHANGES

Secretary LAIRD. Long before his inauguration, the President and I had discussed in detail the priority objectives and goals he had set for his administration. That was a major reason for my statement, when I took office, that I expected to be judged as Secretary of Defense on whether I was able to contribute meaningfully to the restoration and maintenance of peace. I stand by those words.

Based on my service in Congress, I felt that we would get nowhere in the pursuit of peace and national security if we were not willing to face the realities of the domestic and international world. This report emphasizes, as I have many times before, those strategic, political, fiscal, and manpower realities. Against the background of those realities, we initiated major policy changes—changes which are most graphically demonstrated by the results achieved by our changed approach to Vietnam.

Senator YOUNG. Mr. Secretary, I believe you are the least warlike Secretary that we have had in our time.

Secretary LAIRD. Well, I try to be realistic about some of the problems we face.

Senator CASE. Off the record.

(Discussion off the record.)

Secretary LAIRD. When this administration took office:

Authorized military strength in Vietnam was 549,500.

There was no accepted plan to bring American troops home.

There was no plan to terminate U.S. involvement in the war unless there was success at the Paris negotiating table.

VIETNAMIZATION

Both the President and I had long felt that a new, realistic course was essential, a course which would permit us to shift the responsibility for defending their homeland to the people most directly involved—the South Vietnamese themselves. That new course was Vietnamization, a complement to and alternative for negotiation.

This Defense report demonstrates how successful Vietnamization has been. On May 1 of this year authorized troop strength will be

69,000—a reduction of 480,500, or 87 percent from the situation we inherited in 1969. American combat deaths are down 95 percent from their 1968 peak. Our war expenditures are down by about two-thirds. American air activity in Southeast Asia has been reduced by well over 50 percent.

Manifestly, U.S. involvement in the war is coming to an end.

RETIREMENT FROM VIETNAM

Chairman ELLENDER. Mr. Laird, have you any plans to completely withdraw our forces from Vietnam?

Secretary LAIRD. Yes, we do.

Chairman ELLENDER. Have you a date specifically fixed?

Secretary LAIRD. No, we do not. We have one very important concern that governs that date. The President has stated on many occasions that we would maintain an American presence in South Vietnam until our personnel missing in action had been accounted for and our prisoners of war had been released.

Chairman ELLENDER. Yes, I am familiar with that.

Secretary LAIRD. This precludes us from establishing a fixed date at this time. We have made probes of the other side's position on many occasions and we have one of our finest negotiators in Paris today. We have tried to separate the prisoner and missing issue from the military and political aspects of the negotiations but the North Vietnamese have not been willing to separate them.

FIXED DATE FOR WITHDRAWAL OF U.S. AIR FORCE

Chairman ELLENDER. I am familiar with that to some extent but what I had in mind was this. Suppose that all of the ground forces are withdrawn and suppose we come to some agreement on the return of the POW's. Would there be any date fixed for the withdrawal of the Air Force?

Secretary LAIRD. Oh, yes. We have that very well worked out. When I was before this committee last year I discussed the Vietnamization program with you and I told you then that we could reach a point where the South Vietnamese could handle their own air support in-country, and all U.S. forces in Vietnam related to providing their support could be withdrawn. However, the President, our Commander in Chief, says that all U.S. forces will not be withdrawn until the POW question is satisfactorily resolved. I would like to put the pertinent excerpt from this committee's hearings in the record.

(The 1972 committee hearing excerpt follows:)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1972

MONDAY, MARCH 22, 1971

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 9:30 a.m., in room S-126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Pastore, Mansfield, Young, Allott, Hruska, Cotton, Case, and Symington.

DEPARTMENT OF DEFENSE

STATEMENTS OF:

HON. MELVIN R. LAIRD, SECRETARY OF DEFENSE

ADM. THOMAS H. MOORER, USN, CHAIRMAN, JOINT CHIEFS OF STAFF

ACCOMPANIED BY:

ROBERT C. MOOT, ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

RICHARD G. CAPEN, JR., ASSISTANT TO THE SECRETARY OF DEFENSE (LEGISLATIVE AFFAIRS)

CAPT. ANDREW J. VALENTINE, JAGG–USN, LEGAL AND LEGISLATIVE ASSISTANT TO THE CHAIRMAN, JCS

* * * * *

ASSUMPTION BY SOUTH VIETNAM OF ITS AIR SUPPORT

Senator CASE. When an Air Force general was here, I asked a question about how soon the South Vietnamese would take over the air support themselves. I think I am correct in summarizing the answer that there was no time set, and, specifically, that the 1972 budget did not provide for operations and assistance to bring about a self-sufficiency.

Perhaps you don't want to answer that now.

Secretary LAIRD. I would be glad to answer that question now.

Senator CASE. Is that a fair summary of the answer?

Secretary LAIRD. I have had a chance to go over the record, Senator Case, and I would be glad to comment on it.

Senator CASE. Am I correct in that summary?

Secretary LAIRD. I think you are correct in your assumption if we provide the capability for the South Vietnamese to go north, which is a different capability than we are presently planning in the Vietnamization program as far as the South Vietnamese are concerned. We do not presently intend to give them the same capability that the U.S. Air Force has to conduct air operations [deleted].

AIR FORCE BUILDUP

Your question was addressed to that capability. The situation is such that we started out about a year ago when the South Vietnamese Air Force had 23 squadrons. We have brought that number of squadrons up to 33.

At the close of fiscal year 1974 they are expected to have 50. They now have over 350 helicopters and their helicopter force has increased by about 200 since last June. They will have one of the largest helicopter forces of any nation in the free world.

CAPABILITY TO PROTECT ITS OWN SECURITY AGAINST VC AND NORTH VIETNAM THREATS

Those 50 squadrons which they will have will give them, in my opinion and in the opinion of those people planning for their air defense and air security, sufficient capability to meet the North Vietnamese and the VC threat in-country. Our Vietnamization program has, as one of its goals in phase II—the turnover of the air, naval logistics, artillery, and other support capabilities that the South Vietnamese need to meet the VC threat and the North Vietnamese threat in order to protect their own security.

I do not want to mislead you, Senator Case. They will not have the capability of the U.S. Air Force to conduct military missions [deleted].

When I outlined the Vietnamization program to this committee and to other committees of the Congress during the last year and a half, I made that part of the program quite clear. [Deleted.]

LAOTIAN MISSION

Senator CASE. What about the Laotian mission?

Secretary LAIRD. The Laotian mission, as far as interdiction is concerned?

Senator CASE. Yes.

Secretary LAIRD. We are going forward to develop the interdiction capability [deleted] that the South Vietnamese need to defend themselves.

Senator CASE. For self-sufficiency for the South Vietnamese?

Secretary LAIRD. Yes, sir; that is the whole idea behind the Vietnamization program.

Senator CASE. May I just interject for a moment and then I will desist, because you know exactly what we wish to know.

I think there is an exaggerated tendency on the part of everybody, including the media, to seize upon unfortunate news. But I think this is a very natural result of the fact that for years we have been getting hog wash, and that this skepticism is not a product of a desire that we lose this war. Certainly it isn't on the part of this Senator, and I am sure it is not on the part of anyone on the committee. But, rather, we have had glowing reports for so long that have been unfounded that it seems to be necessary to get down pretty much to the hard rock.

That is why I appreciate what you are telling me here. Please go ahead.

UTILIZATION OF GUNSHIPS FOR INTERDICTION AND SOUTH VIETNAM INTERDICTION MISSIONS

Secretary LAIRD. On the situation as far as interdiction is concerned, one of the most far-reaching developments which has taken place during the last 18 months has been the development of new techniques for the use of the gunship. These gunships, which have been developed, not only the Cobra, but the AC–130's and others, have been most successful as far is interdiction is concerned.

We are now planning to give the South Vietnamese the capability in that area. The South Vietnamese probably will carry on their interdiction missions somewhat differently from the way the United States does. I think we should not try to build the South Vienamese force in the image of the U.S. force. As a matter of fact, when I visited with President Thieu and the joint general staff, we spoke at great length about this problem. We have a little difference of opinion on the manner in which their manpower should be used compared with the manner in which U.S. manpower is used.

[Deleted.]

PEOPLE'S SELF-DEFENSE FORCES

They are putting a greater emphasis on the people's self-defense forces in the areas involved. They will be doing interdiction a little differently than we do, depending to such a large extent upon air power. But we are going to give them a capability in that area.

MOBILITY CAPABILITY

It will not be the same capability the United States has. This idea that we should build their forces exactly in the image of U.S. forces, I think, is a mistake, because the mobility which they need is not the same kind of mobility that we need. Their forces—even their regular forces—to a large extent will be stationed in areas in which they live, and the need for mobility on the part of all their forces is not the same need for mobility that we have.

I would point out again that even their mobility capability is very great.

BUDGET SUPPORT FOR SOUTH VIETNAM

Senator CASE. I appreciate that answer very much. Just to be sure I understand it, I think probably this ought to be made public, and I can comment on that, too. This budget that we are considering is calculated, and in your opinion adequate, to give the South Vietnamese self-sufficiency for the protection of South Vietnam?

Secretary LAIRD. This budget will give us the capability of providing the assistance that is needed, and necessary to move forward with such a program.

CONTINUED MILITARY ASSISTANCE AND FORCE SUPPORT FOR SOUTH VIETNAM

Senator CASE. To move forward or to accomplish it?

Secretary LAIRD. Well, it will not be accomplished by this budget alone, Senator Case.

Senator CASE. That means it won't be accomplished within this time period?

Secretary LAIRD. No; that does not mean that. It means that we will have to support the South Vietnamese forces in fiscal year 1973. As long as the conflict continues and the Soviet Union continues to give military assistance in large amounts to North Vietnam, we expect that we will have to continue to give military assistance and support to the forces of South Vietnam.

Senator CASE. Does that mean in terms of materiel or manpower, or both?

Secretary LAIRD. This is in the terms of materiel largely—primarily a support role.

VIETNAMIZATION PROGRAM AND RESIDUAL U.S. FORCES: RESOLUTION OF PRISONER OF WAR PROBLEM

We have one other proviso which I hope everyone understands. That is that we are going forward with this Vietnamization program, but contrary to some reports, we have made no decision on the American presence that will remain in Vietnam. The American forces that remain are limited by a very important proviso. That is that the President of the United States has said that an American presence will be maintained in South Vietnam until the prisoner of war question is resolved. So when I answer these questions I do think it is important to keep pointing that out. Many people read into it just a direct answer to that question and fail to realize that we have this important proviso that the President has stated many times. I have also stated that the Vietnamization program will not be completed and American forces will remain until the prisoner of war question is settled.

Senator CASE. I understand that. That is the reason I asked my question not in terms of when we were going to get out but, rather, in terms of the self-sufficiency of the South Vietnamese. I have had very much pressure on that.

RECAPITULATION

Just because this is so terribly important against the background of the years of confusion, ambiguity and so on—and I don't think anybody can be helped or hurt, or anything but be helped by having this as widely understood as possible in this country and abroad—it is your view that what we are doing in this budget will bring South Vietnam to a capacity to take care of itself in the air and in other ways as far as the defense of its own country goes, subject to the qualification that you made, and that so long as material is supplied in substantial amounts to North Vietnam by the Russians, or, I take it, the Chinese to the extent they can, we would continue likewise to give the South Vietnamese material support. Is that a fair statement?

Secretary LAIRD. That is my assessment.

Senator CASE. And that does not include active military operations on our part?

Secretary LAIRD. Except in connection with the presence of American forces for security purposes.

Senator CASE. For the presence and their self-protection, presumably.

Secretary LAIRD. And their self-protection. They would not have the primary combat responsibility, but they would be combat qualified. They would not just sit along the fence line, these Americans that continue to be present there. They would conduct missions to protect the Americans that are present in the country.

Senator CASE. Thank you, Mr. Chairman.

PHASES I AND II

Chairman ELLENDER. I presume the total withdrawal of our Air Force personnel will be made possible by improving the capability of the South Vietnam Air Force?

Secretary LAIRD. Yes. Phase 1 of the Vietnamization program, as I have outlined to this committee, provided for the turning over of the ground combat responsibility to the South Vietnamese. Phase 2 involves truning over the air, artillery logistics and other support activities. Phase 2 has taken us a little longer because of the training requirements and so on. When this program first started the Vietnamese Air Force had about 200 combat and combat support aircraft; now they have over a thousand aircraft. They have one of the largest air forces of any nation in the free world, and that program is moving along very satisfactorily. We believe that the South Vietnamese will be able to take care of their own in-country security when this program has been carried out. I don't want to give this committee the impression that that program will finally be carried out until this one question has been adequately resolved and——

Chairman ELLENDER. That is the release of our POW's?

Secretary LAIRD. Yes.

TROOP WITHDRAWALS PRIOR AND SUBSEQUENT TO RELEASE OF PRISONERS OF WAR

Chairman ELLENDER. If the POW's are released, is the matter of the withdrawing of our Air Force just a matter of a few days or a couple of months?

Secretary LAIRD. Well, I would want to bring out the equipment, but we have a plan that would permit us to withdraw all of those assets. That particular plan can be carried out rather rapidly now that we will be down to 69,000 by May 1st. Last year when I was before this committee we had many more thousands involved, but we are now going to be down to 69,000 by May 1. We are withdrawing at the rate of around 23,500 a month. That is averaging these last 3 months, and General Abrams has assured me that this program can continue. The President has placed this one very important limitation factor on the final termination of American involvement in the war and the finalization of the Vietnamizatio program.

Senator YOUNG. Can you go much further in withdrawing troops until the prisoners of war are released?

Secretary LAIRD. I don't want to get fixed to the 69,000 figure because we can go somewhat below that. But if we are required to maintain a presence until this matter is resolved, you do have to provide adequate security for those Americans that remain. I do want to see that they are adequately protected. I just don't want to set a figure because I don't want these Americans to be placed in a position where they can be used just as sort of hostages in this negotiating process.

NORTH VIETNAM VIOLATIONS OF GENEVA CONVENTION HUMANITARIAN ASPECTS

You see, the important thing for us to be stressing right now with the free world and with the Communist countries and with those neutral nations is the humanitarian aspects of this whole question of the prisoners of war and those missing in action. The North Vietnamese have simply refused to break this question—the question of release and withdawal—away from the political issues. Release and withdrawal is not a difficult area for us to deal in but when they get into the political tie-ins, that is difficult. So I hope we continue to focus world attention on the humanitarian aspects of the Geneva Conventions and the fact that the enemy is not abiding by these conventions. They are violating many different aspects of the conventions, and I would like to put Hanoi's violations in the record at this point if I could, Mr. Chairman.

(The information follows:)

HANOI'S VIOLATION OF GENEVA CONVENTION

The Geneva Convention requires that prisoners be humanely treated and protected. This provision has been consistently violated.

The Geneva Convention requires that neutral inspection of prisoner camps be permitted, including interviews of the prisoners without witnesses in attendance. The enemy has never permitted such inspection or such interviews.

The Geneva Convention requires that the names of all prisoners be released promptly. Such names as the enemy has released have not been released promptly nor through regular channels.

The Geneva Convention requires notification of deaths in captivity and full information on the circumstances and place of burial. The enemy has not furnished any information about circumstances of death and place of burial.

The Geneva Convention requires that prisoner of war camps be marked clearly and their location be made public. The enemy has not marked its camps nor divulged their location.

The Geneva Convention requires that the seriously sick and wounded be repatriated or interned in a neutral country. The enemy has refused to comply with this provision.

The Geneva Convention requires that prisoners be permitted to send at least 2 letters and 4 cards a month. The average has been 2 or 3 letters a year and none at all from some prisoners.

The Geneva Convention requires that sufficient food must be given to prisoners. Yet, all of the released prisoners have been found to be underweight and suffering from malnutrition.

The Geneva Convention requires that prisoners not be held in close confinement. Yet, the enemy has held some men in solitary confinement for years.

Total Withdrawal of U.S. Forces Shortly After Release of Prisoners of War and Accounting for Missing-in-Action

Chairman Ellender. Mr. Secretary, I think that the Senate well understands the President's position that we leave troops there so long as there are POW's.

But the question is going to come up again just as sure as we are talking together here. The Mansfield amendment might be introduced again. But is it your considered judgment that, as soon as the POW's are returned, the length of time that our Air Force or any of the forces would remain in Vietnam will be very short?

Secretary Laird. That is correct.

Chairman Ellender. All right.

Adequate Peacetime Nixon Doctrine Forces and Technological Superiority

Secretary Laird. We are now planning for the period beyond Vietnam, and devoting even greater attention to America's long-range security needs—adequate peacetime Nixon doctrine forces, and the urgent need to assure technological superiority.

U.S. Airpower Responsive to Possible Enemy Buildup or Offensive Action

But, Vietnamization continues, and it will not be complete so long as the enemy refuses to return all Americans now held in captivity and until there is an accounting for all missing in action. We will not abandon our prisoners of war, our missing, or their families. And until our men are free, we will continue to demand that they be treated in accordance with the humanitarian provisions of the Geneva Convention.

Nor should there be any doubt about our determination to take whatever steps are necessary to protect our diminishing forces as we continue to withdraw from Vietnam. If the enemy's response to President Nixon's comprehensive offers of peace should be a continued buildup which threatens the safety of our men—or further offensive actions—we are prepared to respond with American airpower as appropriate.

U.S. DEFENSE FORCES MAINTAINING STRENGTH

In his state of the Union message last month, the President said: "Strong military defenses are not the enemy of peace. They are the Guardian of peace."

Mindful of the President's determination to maintain whatever military strength is needed, the Department of Defense makes this pledge: We are determined to provide adequate U.S. military forces so that we can, with our friends and allies, deter war.

In my last Defense report, I established planning goals for the Nixon doctrine peacetime defense forces under the strategy of realistic deterrence. These planning goals called for:

No more than 2.5 million volunteers in the active military forces, backed by a strengthened National Guard and Reserve;

An allocation of no more than 7 percent of the gross national product.

The actual results achieved for the fiscal year 1973 Defense Budget include:

An end-strength of less than 2.4 million military men and women in a diminished draft environment;

A budget of less than 7 percent of the expected gross national product.

The Nation's military strength was maintained during 1971 at the level prudence dictated; further, important steps were taken to assure that our strength would remain adequate for future years.

We have been changing the composition of our forces and the allocation of our resources to attain stated national goals in an optimum manner. These changes include:

Better utilization of people.

Improved deployment of our peacetime Nixon Doctrine deterrent forces.

Increased emphasis on partnership and burdensharing.

Improved weapon system acquisition methods.

Coordinated and integrated security assistance planning.

The decisionmaking process in Defense also has changed. Now, the emphasis is on participatory management, with both our civilian and military leaders being given an opportunity to be heard fully before decisions are reached.

There is also a changed relationship between the Department of Defense and the Congress. We recognize the partnership that must exist with Congress, which as a coequal branch of government shares equally the constitutional responsibility for insuring the safety and security of our country.

The strategy of realistic deterrence can only succeed if there is general acceptance of the further modification in the national security concepts of the 1960's which I identify in this report. We have a new approach to planning and assessment methodology. With this new methodology, we seek to avoid the errors of the past which led to our ever-increasing commitment in Vietnam. That is a mistake we cannot afford to make again.

What we have done in the past 3 years now makes it possible for us to put three essential and interrelated planning tools to work for peace: Net assessment, total force, and long range planning.

NET ASSESSMENT

I said at the beginning of this report that the business of peace is a complex one. Net assessment in national security planning is an indispensable tool for coping with these complexities. In simple terms, net assessment, in conjunction with total force planning, tells where we are, what we need to do, and how to get there.

To put it more fully, net assessment is a comparative analysis of those military, technological, political, and economic factors:

Which impede or have a potential to impede our national security objectives.

With those factors:

Available or potentially available to enhance accomplishment of those same national security objectives.

Through this process, we are able to determine how to apply our resources more effectively to accomplish our national security goals.

RUSSIAN THREAT

For example, the momentum of Soviet weapons development and deployment demands examination in relation to what we and our allies and friends must do about it. A similar assessment must be made of the increasing military capability across a broad spectrum of the Peoples Republic of China.

Since my last Defense report hard, new evidence reveals such developments in the threat as:

The deployed Y-class ballistic missile submarine force of the Soviet Union could be as large as our Polaris/Poseidon force by next year, rather than in 1974 as I predicted last year.

Continued nuclear weapons and missile testing by Mainland China with some ballistic missile deployments likely this year.

The new Soviet supersonic dash bomber, designated the Backfire, could be operational by the mid-1970's.

Some 100 new Soviet ICBM silo sites have been identified for new or modified ICBM systems. The possibility of such a new program was mentioned in my Defense report last year.

Soviet MIRV capability could be achieved next year.

Construction of the Moscow ABM system has resumed, and testing of an improved ABM missile continues.

Chairman ELLENDER. The missiles the Russians have on their submarines are like our Polaris.

Admiral MOORER. Yes; but they have tested it.

Chairman ELLENDER. They have tested it, but it will take time to put this new missile on their present submarines so as to make them comparable to what we now have.

Admiral MOORER. Mr. Chairman, I think they are behind us in this area of technology probably 2 years.

Chairman ELLENDER. So that it will take at least 2 years or more before they have a missile similar to the one we have in the Poseidon?

Secretary LAIRD. They have been working on a new submarine-launched missile. I think it will take them about 2 years now to catch up as far as Mirv technology is concerned, and about [deleted] years for deployment.

Chairman ELLENDER. Good.

Secretary Laird. But I want to stress I believe they have the capability to do so.

TESTIMONY OF ADMIRAL MOORER

Chairman ELLENDER. I am talking about the actual ability to install it in less than 2 years. That is what I am talking about. Maybe two and a half years.

Secretary LAIRD. The chairman will get into the question of the kind of deployments of multiple re-entry vehicles they are presently making. [Deleted.] This will be explained this year in Admiral Moorer's briefing. Their MRV's do have a capability of changing the pattern of impact of the warheads, but their system does not use a bus technique like we do. I don't like to get into the discussion of what you call that, I call it MRV. I just personally don't want to get into it.

Senator CASE. Your reference relates to the identification of a somewhat different system?

Secretary LAIRD. I don't want to get into a discussion about that, because they will use a different system than ours when they also go forward with their program. They are using a little different system than we had anticipated, and the Chairman of the Joint Chiefs will explain that in a briefing this afternoon.

OTHER RUSSIAN PROGRAMS

Now, continuing with the discussion of new developments in the threat in my Defense report:

Ongoing Soviet naval ship construction programs include production of nuclear-powered torpedo attack and cruise-missile submarines.

New Soviet fighter aircraft, especially the high-speed Foxbat as well as the Flogger and Fitter B are entering the inventory.

Two new Soviet tanks, one a light tank and the other a new main battle tank are probably in production.

We will get into a detailed comparison of Soviet and United States forces later, and the chairman will go through the numbers. They have certain advantages in some areas, while in others we have certain advantages. But their requirement seems to us to be different because in a NATO conflict they would be fighting closer to their home territories than the United States would be. We have a forward defense strategy, whereas their situation is different. The chairman, in his briefing this afternoon, will get into that subject.

There were some, several years ago, who questioned my earlier estimates and projections of Soviet weapons momentum. If anything, as subsequent events have demonstrated, these estimates and projects were conservative.

U.S. FORCE CAPABILITIES

In conjunction with my Defense report, the Chairman of the Joint Chiefs of Staff, Adm. Thomas H. Moorer, will present to Congress and the American people a comprehensive military assessment of our own force capabilities.

Our combined presentations this year will represent another step forward in our new emphasis on net assessment.

RUSSIAN-CHINESE CONSTRAINTS

However, as we evaluate the strength of Soviet and Chinese weapons developments and deployments, we must also take into account in a realistic net assessment the fact that they face some considerable constraints, such as:

The Soviet Union and mainland China must deploy hundreds of thousands of troops to their Far Eastern border;

The Soviets growing fleet must contend with the paucity of all-weather port facilities;

The Soviet's trail the United States in many frequently overlooked but essential matters, such as long range underway replenishment at sea and containerization.

RUSSIAN PORT FACILITIES

Chairman ELLENDER. Do you mean their fleet is home based?

Secretary LAIRD. There has been a change, however, in the last 6 or 7 years, the Soviet fleet is operating throughout the world, and they now have a truly deep water navy, capable of operations throughout the world.

Chairman ELLENDER. They are using facilities that we constructed in the Indian Ocean, right off Somalia. We built a port there for the purpose of exporting corn that would be produced in Somalia. I understand that the Russians have access to it, although we built it. I believe that they are moving into quite a few other areas.

Secretary LAIRD. They have port facilities in Egypt. In the Mediterranean, they are really building their own facilities in Egypt, and they are looking for other facilities.

SUPPORT OF OTHER NATIONS

Chairman ELLENDER. They might receive the same treatment that we received in North Africa. I have often said that we have been making a mistake in trying to prevent Russia from supporting other countries. I hope they are put in a position where they must give a great deal of aid to other countries, so that they can learn from experience how ungrateful people can be.

While they were dealing with Egypt, for instance, we were assisting Egypt, too, through the Public Law 480 program. That is one policy that I objected to, but I was overridden.

Admiral MOORER. The Soviets are moving in that direction, Mr. Chairman.

Chairman ELLENDER. I hope they extend themselves in the field of aid, particularly food and things of that kind.

Senator YOUNG. What is the latest on Malta? Did the British arrange to stay there?

Secretary LAIRD. Negotiations are still going forward and there will probably be some further negotiations this week. The British, of course, have the primary responsibility in this negotiating area because they have had the long term relationship with Malta. NATO is also negotiating through the Secretary General of NATO, but there has been no resolution of the Malta question.

Senator YOUNG. The Russians are interested in that base, too, are they?

Secretary LAIRD. I think the Russians certainly would be interested in it.

Senator YOUNG. I think the British took action with respect to Malta about the way we did in terms of the Okinawa reversion. I believe the Russians would have kept it if they had been there.

Secretary LAIRD. There is no question about that.

The Soviets operate somewhat differently than we do.

BRITISH RESPONSIBILITY TO KEEP THEIR TROOPS ON MALTA

Chairman ELLENDER. Mr. Laird, am I correct in my recollection that, in answer to a question I asked you some time ago, that is it not contemplated that our Government would pay to keep the British troops in Malta?

Secretary LAIRD. No, it is not contemplated that the U.S. Government would pay to keep British troops. That would be a British responsibility.

[Deleted.]

Chairman ELLENDER. [Deleted.]

Secretary LAIRD. [Deleted.]

Chairman ELLENDER. I wish NATO would take part in that.

MODERNIZATION OF U.S. BARRACKS IN GERMANY

Secretary LAIRD. I think we have made some progress in that regard. I testified before the committee last year, and I told you of the efforts I was making to see that the Federal Republic of Germany took over the responsibility for our barracks modernization and some other things that we had been working on for some years. We were able to arrive at such an agreement this year, and I do get into that in some detail in this statement.

Chairman ELLENDER. You may proceed.

U.S. MAINTENANCE OF TECHNOLOGICAL SUPERIORITY

Secretary LAIRD. Any assessment of the future defense needs of the United States must include a program to assure our continued technological superiority. The 1957 Sputnik success shocked this country, and led to a flurry of remedial actions which culminated in our successful moon landings. In that instance, fortunately, we were dealing with a peaceful competition, yet it took us more than 10 years to accomplish the job despite our significant technological lead.

Beginning in 1965, at the same time that we were diverting so much of our effort and technology to Vietnam, the Soviet Union was stepping up its research and development efforts and was beginning to produce many of the weapons systems we note today. The U.S.S.R. has now reached a position where—unless we take appropriate action—there could be new surprises and new "sputniks." But they are less likely to be in areas such as the peaceful exploration of space; rather they are more likely to be part of a major new Soviet military capability.

It cannot be said too often that an open society such as ours is at a disadvantage in facing the challenge of a closed society which seeks, through all means at its disposal, to become the world's greatest power.

So I would repeat what I have said so many times; the American people may perhaps be willing to accept parity in regard to the deployment of strategic nuclear weapons; but, in my view, they will never accept a position of inferiority.

RESEARCH AND DEVELOPMENT BUDGET REQUEST INCREASE

Therefore, in order to avoid that unacceptable danger, it is absolutely essential that we maintain technological superiority. The $1 billion increase in the fiscal year 1973 R. & D. budget over that which Congress gave us last year is aimed at maintaining that superiority.

The Soviet Union continues to expand its weapons development and deployment programs. There may be some debate as to whether—or by how much—the Soviet Union is outspending us in research and development. What must concern anyone responsible for our national security is the demonstrable fact that we could lose the technological race. And second place in that technological race is simply not good enough.

At this point I would like to include in the record the chapter of my defense report that discusses in detail our approach to net assessment, as well as the threats to our security.

(The excerpt follows:)

II. NET ASSESSMENT AND THE THREAT

A successful Strategy of Realistic Deterrence requires a careful and intricate assessment of the various threats to peace, freedom and stability that exist in today's world.

The overriding concern of the Department of Defense is to provide adequate United States military forces so that we can, with our friends and allies, deter war. Should deterrence fail, these forces must be capable of prompt and effective use to achieve United States national objectives.

Assessment and planning in the nuclear age are intimately related to an understanding of international relations on the one hand and to weapons technology and possible use on the other hand. There is, of course, nothing new in this dependence. What is new is the enormous complexity that has entered into force planning since World War II, compounded by dramatic technological advances, major world economic adjustments, and a fragmenting of the past bi-polar world structure.

The international environment is dynamic, confusing and in some aspects disconcerting. The rate of change -- political, economic, social and technical -- is perhaps the greatest we have ever known. Net Assessment offers a valuable tool for understanding and responding to these challenges.

To assist in establishing the requirements for United States and allied forces as well as for Security Assistance to our own allies, a series of Net Assessments in selected critical areas have been made. More are in progress. It is important to re-emphasize that any realistic assessments and resulting plans for military forces and new weapon systems must include political, economic and social considerations.

Net Assessment plays a critical role in our Total Force Planning and in the development of forces necessary to maintain our national security. In these assessments we weigh the capabilities of potential enemies against our capabilities and those of our allies. At the same time, we must give careful consideration not only to the strengths of potential adversaries, but also to the deficiencies in their capabilities and the various constraints with which they must cope.

The end product of Net Assessment provides a basis for judging whether, in the case examined, we and our allies will be able to sustain our national objectives and protect our vital interests, or if not, where there are problem areas.

The four realities which I have discussed on many occasions in the past three years represent the four major areas we must take into account in any comprehensive Net Assessment related to national security planning. They are the Strategic Reality, the Political Reality, the Fiscal Reality and the Manpower Reality.

A. THE STRATEGIC, POLITICAL, FISCAL AND MANPOWER REALITIES

1. Strategic

The discussion and assessment of the threats we and our allies face -- from strategic nuclear to sub-theater, from communist military assistance to the Soviet challenge to U.S. technological superiority -- will be the major focus of this chapter. In combination, these threats represent the more obvious dimensions of the strategic reality.

Developments in the Soviet threat have brought the strategic reality into sharper focus during the past year. The Soviet buildup is showing even greater momentum than I projected in last year's Defense Report:

-- The Y-class ballistic missile submarine force of the Soviet Union could be as large as our POLARIS/POSEIDON force by the end of next year, rather than in 1974 as I predicted last year.

-- The new Soviet supersonic dash bomber, the BACKFIRE, could be operational by the mid-1970s.

-- Nearly 100 new ICBM silo sites have been identified, for new or modified ICBM systems. The possibility of such a new deployment program was mentioned in my Defense Report last year.

-- Construction of the Moscow ABM system has resumed, and testing of an improved missile continues.

-- Ongoing Soviet naval ship construction programs include production of nuclear-powered torpedo attack and cruise-missile submarines, and at least one large new cruiser, armed with multiple missile systems.

-- New Soviet fighter aircraft, especially the high speed FOXBAT as well as the FLOGGER and FITTER B, are entering the inventory.

-- Two new Soviet tanks, one a light tank, and the other a new main battle tank are probably in production.

2. Political Reality

The President in his Foreign Policy Report, and the Secretary of State in his annual Report on U.S. Foreign Policy, discuss in detail the national and international political realities that confront the United States.

As Secretary of Defense, I also must take explicit account of both international and domestic political realities. From my perspective as a defense planner, these include:

-- The political and psychological effects of the growing Soviet military capabilities and presence around the world, such as in the Mediterranean, the Middle East, the Indian Ocean and the Caribbean.

-- Allied concerns that we maintain substantial forward deployed U.S. forces.

-- Countervailing Congressional concerns to bring about a withdrawal of substantial portions of our forward deployed forces.

-- The possible effect potential agreements controlling or reducing arms could have on the need for U.S. military forces.

-- The difficulty of maintaining broad domestic public support for those programs necessary to assure national security.

3. Fiscal Reality

The fiscal reality is simply stated: resources are limited, yet there is an increasing need to commit greater resources to urgent domestic demands. This reality is apparent from the allocation of resources in this Administration's federal budgets. In 1968 the Department of Defense received about 39% of the federal budget, in 1973 it will be about 30%. Over the same

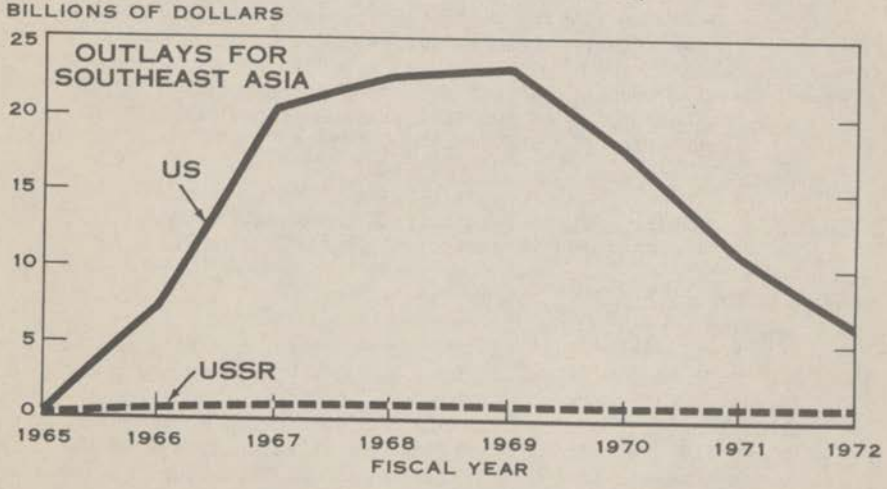
periods the human resources share of the budget went from some 32% to 45%. While these numbers express a fiscal reality, they must also be considered in the context of the internal factors that impact on the DoD budget and the external factors of change in the Soviet Union's budget. For example:

-- 53% of FY 1972 outlays in the DoD Budget were people-related costs, a figure that will rise to 56% in the FY 1973 Budget. By comparison, only about 30-35% of the Soviet defense budget is devoted to such costs. As a result, when we estimate Soviet personnel expenditures relative to U.S. prices, the USSR starts with a significant advantage in purchasing power available for weapons-related programs, given roughly comparable total Defense budgets. This built-in Soviet advantage has been greatly enhanced at our expense since 1965 because of the costs of the war in Vietnam.

The chart below compares United States and estimated Soviet expenditures in support of the conflict in Southeast Asia since 1965.

RELATIVE IMPACT OF SOUTHEAST ASIA CONFLICT ON US vs. USSR

(IN FY 70 DEFENSE DOLLARS)



-- The following table estimates United States and Soviet military outlays for operations, procurement and military construction; U.S. Southeast Asia expenditures are shown separately. You will note that from 1965 through 1972 the Soviets have had substantially more funds available to apply to the development of their total military capability. The U.S. on the other hand has been restricted in its ability to invest in more modern and improved military capabilities. Since 1966, when the net available to the Soviet Union first exceeded that for the U.S., the Soviet Union has had some $21 billion more available for modernization than has the U.S. This difference has had a significant and adverse impact on the military posture of the United States relative to that of the Soviet Union.

RELATIVE IMPACT OF SOUTHEAST ASIA CONFLICT
ON U.S. VS. USSR 1965-1972

	Soviet Expenditures by Calendar Year (Billion 1970 Dollars)						
	1965	1966	1967	1968	1969	1970	1971
USSR Military Outlays*	49.9	51.6	54.1	56.2	57.2	58.3	59.1
	U.S. Expenditures by Calendar Year (Billion 1970 Dollars)						
U.S. Military Outlays*	53.6	62.7	72.0	73.8	69.8	65.0	60.7
Military Outlays for SEA (including MASF)	3.0	12.7	19.9	20.3	17.7	11.9	6.4
Net Available	50.6	50.0	52.1	53.5	52.1	53.1	54.3

* Excludes RDT&E, Military Assistance and AEC-Type Outlays

-- In constant 1970 dollars: the baseline forces before the Vietnam war buildup in 1964 cost $50.6 billion in Budget Authority; the Nixon Doctrine forces, although smaller because of our new Strategy and the Total Force Concept, will cost $79.2 billion in FY 1973. This higher cost in FY 1973 funds a manpower level 326,000 below FY 1964.

A more detailed discussion of the impact of the fiscal reality can be found in the final section of this report: The Defense Budget.

4. The Manpower Reality

The Manpower Reality has become an increasingly important factor in Defense planning, particularly as we move toward a restructured and revitalized defense force without resort to the draft. It is not easy to obtain and retain the manpower needed in quality and quantity under voluntary enlistment.

Military manpower in the last few years has become considerably more expensive. The average annual pay for military personnel and civilian employees has been significantly improved in the past few years. Since 1964, military average basic pay rates have more than doubled (125% growth). Average civilian salaries have increased by 70% since 1964.

Furthermore, when comparing our general purpose forces with those of the Soviet Union, we have to face the hard reality that the Soviets can field more men than the U.S. can at equal over-all costs.

Among the factors which account for higher manpower costs in U.S. forces are the following:

-- The growing demand for highly skilled people.

-- The increasing level of technical sophistication of U.S. weaponry which, in turn, requires highly skilled people.

-- The continued need for a high state of readiness requires extensive training and calls for a high level of maintenance for our weapon systems.

The collective impact of all these pressures is great. The costs of our personnel will constitute 56% of our budget outlays in FY 1973, compared with 43% in FY 1964. The obvious implication is that we must place greater emphasis in our reduced force on modernized and technically capable forces.

These four realities must be carefully considered in determining our military requirements and planning our forces to meet these requirements. We need to know the full dimension of the strategic reality if correct requirements are to be formulated. In meeting the threat we must consider the fiscal reality to bring maximum efficiency in the use of scarce resources for defense, to claim for defense no more of the nation's resources than needed and to minimize economic dislocations influenced by defense spending. Also, we need to take account of the political realities, including the feasibility of obtaining legislative approval and public support for our programs.

Finally, the manpower reality -- in conjunction with the fiscal reality -- has generated powerful pressures for smaller forces. Given these realities, our forces must have the most modern and effective equipment practicable and must be supported by a vigorous research and development program that can assure our continued technological superiority in the future. In addition, our intelligence activities take on greater importance. In the face of an increasing and complex threat, we need to know more about what is going on. We need foreknowledge of attacks against us or our allies, and we need to know enough about each major threat to be able to counter it as necessary.

Let me now turn to an assessment of the various threats to peace.

B. THE THREATS TO FREE WORLD SECURITY

While all four realities must concern the Department of Defense, the Joint Chiefs of Staff and I must be most concerned about the military realities that face us -- the threat posed by the military forces of potential opponents, the potential impacts of military assistance and the technological challenge.

The Chairman of the Joint Chiefs of Staff, Admiral Moorer, will report to you on his view of our military posture. When I refer to military force inventories it will be in a summary form,

knowing that he will give you the details in his presentation. I also will present a few of the charts which Admiral Moorer will discuss more fully in his statement.

It is true that the world is in a period of transition from its former dominance by two superpowers. But it is equally true that, from a military perspective, we must continue to view the Soviet Union as the primary potential threat. The military forces of the Soviet Union, and their threat to U.S. and Free World security, must continue to be the dominant factors in our planning of programs and forces to support our Strategy of Realistic Deterrence.

Three categories of Soviet military forces deserve particular attention -- strategic nulcear, theater nuclear and theater conventional. These specific categories were chosen for ease of understanding and clarity of presentation, but such structuring does not mean that the forces discussed can be neatly allocated specific roles in the spectrum of conflict.

As I noted earlier, our Strategy places primary emphasis on U.S. forces for the deterrence of strategic nuclear warfare. We will, therefore, first look at the reality of the Soviet strategic threat, and then discuss the nuclear forces of the Peoples Republic of China.

1. Strategic Nuclear Threat

The Soviet Union

Figures 1 through 4 give estimates of Soviet strategic offensive strength in terms of numbers of operational ICBM launchers, numbers of SLBM launchers, numbers of intercontinental bombers, and total number of intercontinental strategic offensive delivery vehicles. Estimates of these various measures are provided for the decade 1962-1972, together with similar U.S. measures for comparison.

It is evident that the Soviets have built up their ICBM forces at a rapid rate during the past five years. As of the end of 1971 they had some 1,520 operational launchers, including some deployed in MR/IRBM fields.

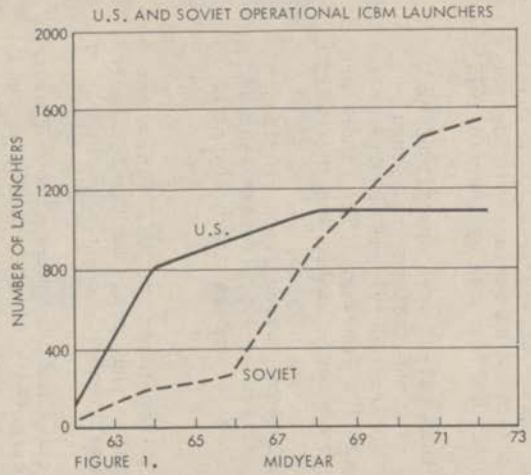


FIGURE 1.

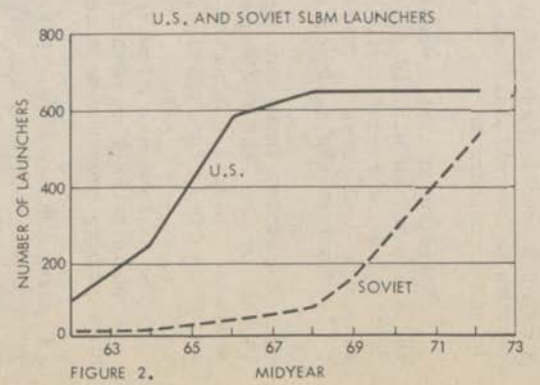


FIGURE 2.

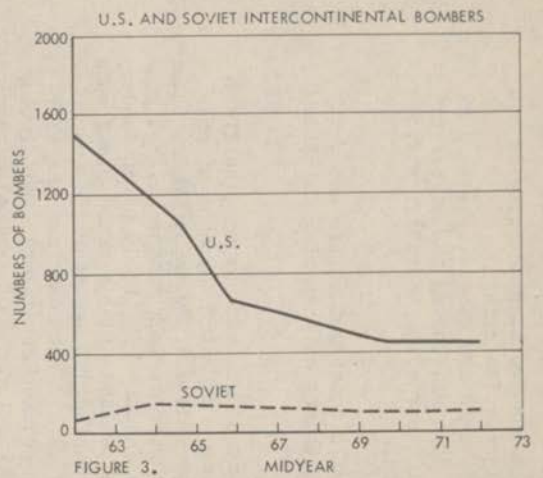


FIGURE 3.

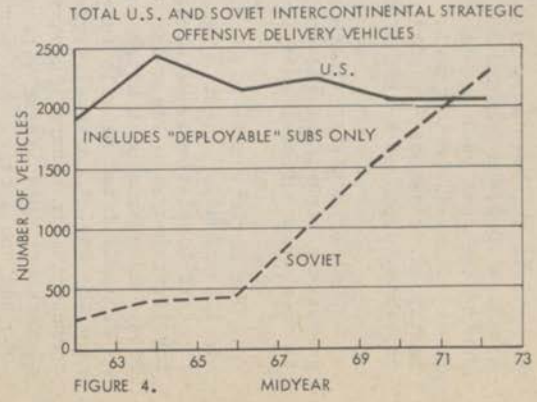


FIGURE 4.

There has been very little construction activity on the standard SS-9, SS-11, and SS-13 missile sites during the past year and the Soviets may have completed this phase of missile deployment. However, during the course of last year we detected almost 100 new silos that differ from currently deployed Soviet ICBMs.

The implications of new silo construction are not yet completely clear, but the Soviets may be preparing to deploy two new or modified ICBM systems.

The Soviets have a substantial nuclear-powered, ballistic missile submarine fleet. The most capable component of this fleet is the Y-class which, like the U.S. POLARIS, has 16 tubes for launching missiles. The number of such submarines has grown from four operational units in January 1967 to 25 as of January 1972. Additional missile tubes on the older H and G class subs give the Soviets a total approaching 500 launchers in the operational inventory (January 1972). At least another 17 Y-class submarines are in various stages of assembly and fitting out, and could bring the operational force of Y-class submarines to 42 as early as the end of 1973. With a continuation of the current production rate of 9-10 units per year, the USSR would develop an operational force of Y-class submarines considerably larger in numbers to the current POLARIS force by the mid-1970's.

There seems little doubt that out-of-area operations by these submarines will increase over the next several years -- continuing the recent trend of more extensive and regular Soviet submarine deployments. Currently (in February 1972), there are Y-class submarines deployed in both the Atlantic and the Pacific.

The Soviet intercontinental heavy bomber force remains, as it has for the last few years, at around 195 aircraft (including about 50 tankers). A number of these bombers are equipped to carry air-to-surface missiles.

The Soviets have, however, test flown the BACKFIRE, a new supersonic swing-wing bomber, which they could deploy in significant numbers over the next several years.

Although we believe the Soviet medium bomber force of several hundred aircraft is primarily targeted against Eurasia, we cannot ignore the fact that these aircraft do have a one-way mission capability against the United States.

Soviet Strategic Offensive Forces pose an extremely formidable threat to the United States. Our primary method of coping with these forces is deterrence by threat of retaliation. At the same time, we are striving to achieve a limitation or reduction of these forces by negotiation.

As you know, our offensive strength -- our retaliatory capability -- is maintained in the form of ICBMs, SLBMs, and bombers. Our current strength in these forces was shown in the previous graphs and is shown numerically for comparison purposes on the table below. Admiral Moorer will provide detailed information on these systems.

STRATEGIC FORCE STRENGTHS

	November 1, 1971		Mid-1972	
	USSR	US	USSR	US
ICBM Launchers	1520 1/	1054	1550 1/	1054
SLBM Launch Tubes	475	656	580	656
Heavy Bombers	140 2/	565	140 2/	531
Total Offensive Force Loadings 1/ 3/ 4/				
Weapons	2100	4700	2500	5700
Air Defenses				
Fighter-Interceptors	3200	612	3100	593
SAM Launchers	10000	895	10000	839
ABM Launchers	64	0	64	0

1/ Includes SS-11s at MR/IRBM complexes.
2/ Excludes about 50 Soviet tanker and several reconnaissance aircraft.
3/ Data not available for November 1971. Figures are as of mid-year.
4/ Figures for USSR are presented as computed. They should not create an impression of precise intelligence.

As I have already indicated, considerable emphasis has been given during the past year to our Net Assessment Programs -- particularly Net Technical Assessment -- within the Department of Defense. These investigations provide consolidated and organized information, identify intelligence collection requirements, indicate fruitful areas for research, and allow a determination as to how well we are doing in comparison with the Soviet threat. I would like to give you very briefly the results of those assessments which relate to the survivability of U.S. strategic nuclear forces, and our proposed programs. Further details are contained in the following section.

Future significant development in Soviet forces for intercontinental attack will probably lie in qualitative improvements in their ballistic missile forces. Of greatest concern to the pre-launch survivability of U.S. ICBM forces would be improvements in the accuracy of Soviet missiles and the development of a MIRV capability. Considering the problems involved in predicting the future course of Soviet ICBM developments, the lead time required to understand these developments, and the time needed to devise appropriate countermeasures, we are pursuing several different programs. To counter near term qualitative improvements on the Soviet ICBM forces, we are improving the existing hardness of the MINUTEMAN launcher and silo components, for a relatively small investment. In addition, deployment of SAFEGUARD is continuing, and development of a prototype Hardsite Defense System, which could be deployed in the future to augment SAFEGUARD, is in progress. Modification of these programs or additional measures may or may not be necessary, depending on developments in the threat or results at SALT.

The pre-launch survivability of U.S. strategic bombers and tankers is not seriously affected by a Soviet ICBM attack, since sufficient warning permits alert aircraft to escape. At present, the greatest threat to the pre-launch survivability of our bombers is the growing force of Soviet SLBMs. In this case, present tactical warning systems are inadequate. Consequently, a new satellite warning system is under development. In addition, a phased program of interior basing, bomber dispersal, and reduced bomber reaction time is being implemented. Admiral Moorer's presentation provides more information on Air Force plans, and the qualitative improvements in the Soviet SLBM force that these plans are designed to deal with. The pre-launch survivability of our bomber forces would be much improved by deployment of the B-1 aircraft currently in development.

We have also assessed the survivability of the Fleet Ballistic Missile System. To date, investigations show that the at-sea portion of those strategic forces is highly survivable. Indications

are that the Soviets are attempting to establish an area surveillance system, and associated ASW strike forces, but as yet they do not have this capability. Today, the U.S. enjoys a substantial, though decreasing, lead in acoustic sensor technology and submarine quietness -- two important factors that impact on undersea warfare capabilities. In part to offset the possible development of an effective Soviet area surveillance system and for other reasons which are discussed later, we are developing the Undersea Long-Range Missile System (ULMS). This program, together with aggressive effort in submarine quieting and SSBN defense, will, we are confident, provide a continued highly survivable sea-based deterrent.

The strategic defensive forces of the Soviet Union include the extensive deployment of aircraft defense as well as the ABM system deployed around Moscow. Figures 5 and 6 on the following page show the number of Soviet Home Defense Interceptor aircraft and SAM launchers estimated for the period 1963-1972.

Our assessments indicate that Soviet air defenses have good capabilities against medium and high altitude bombers, but their effectiveness against low altitude penetrators -- less than 1,000 feet -- is limited. These defenses consist of several thousand radars located throughout the Soviet Union, a force of over 3,000 interceptor aircraft, and the Surface-to-Air missiles (SAM) shown on the charts on the following page.

The quality of the interceptor aircraft force has improved as newer models have been added. Since 1964, the Soviets have put four new interceptor models into their inventory, the most recent being the FOXBAT. These newer models now make up more than one-third of the force, and are expected to be about one-half of the force by mid-1973.

In addition, four different SAM systems, with about 10,000 launchers, are presently deployed for air defense. This force level should remain about the same through mid-1973. The SA-5 is the newest strategic SAM system, and has been deployed throughout the Soviet Union. Some technical experts continue to be concerned that the SA-5 system could possibly be adapted for use in an ABM role, although there is general agreement that it is not presently intended for this role.

Low altitude approach is the basic tactic used by U.S. bombers to penetrate Soviet air defenses; but that tactic does not, by itself, insure penetration. The penetration of heavy Soviet defenses requires decoys, ECM and air-to-surface missiles. Should the

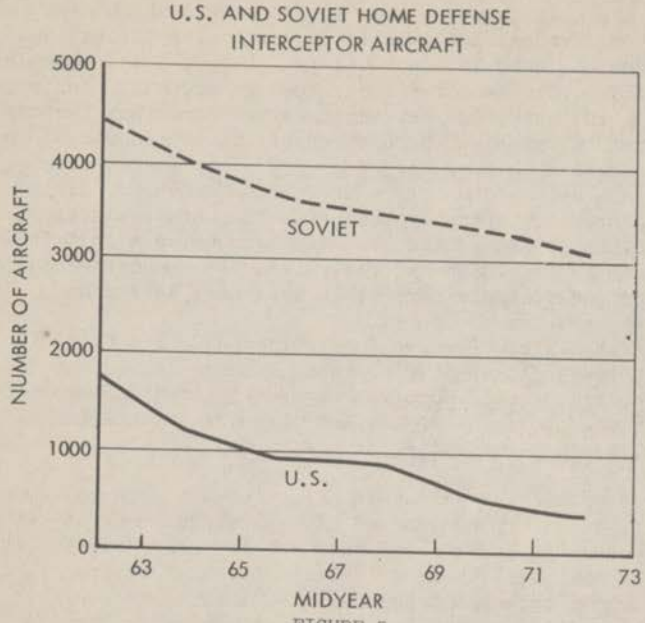


FIGURE 5.

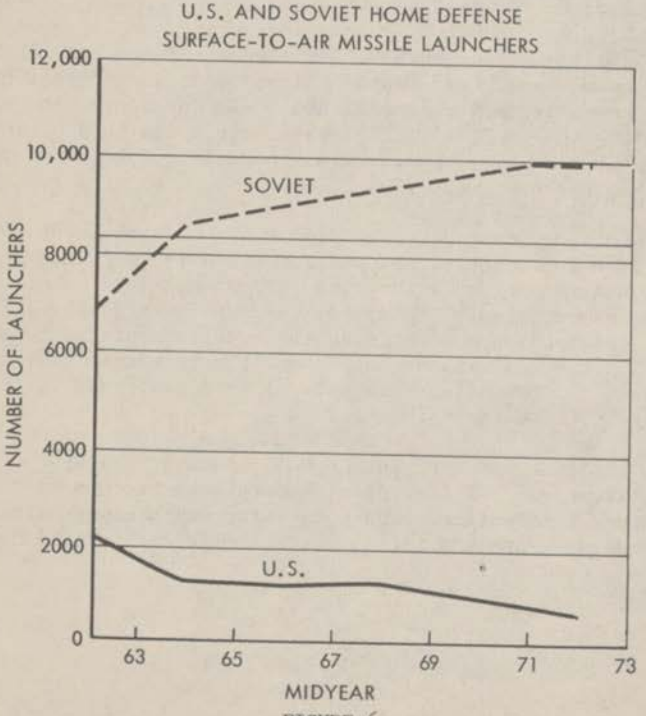


FIGURE 6.

Soviets continue to improve their air defense systems by deploying an over-land Airborne Warning and Control System, or should they, as now projected, introduce advanced interceptors with an ability to locate, intercept, and fire on low flying bombers by the mid-to-late 70's, the United States may have to accelerate SCAD to insure that our B-52s will remain capable, for the rest of this decade, of reaching their targets.

The Soviets are continuing construction of their ballistic missile defenses around Moscow. These defenses include ballistic missile early warning (BMEW) radars, target acquisition and tracking radars, launch facilities and necessary command and control facilities.

There are four ABM-1 complexes at Moscow which provide 64 missiles on launchers. All four complexes are now operational.

From our assessments, we continue to be confident of the ability of POSEIDON and MINUTEMAN III to penetrate all known Soviet ABM defenses.

These assessments of the survivability and penetrability of U.S. strategic forces, of our ability to control those forces should deterrence fail, and the identification and pursuit of programs that can and will maintain our capabilities through the 70's, give me confidence that the United States will continue to have sufficient strategic nuclear forces to deter general war. This conclusion is valid provided that the improvement programs for existing forces, and new programs that will be discussed later, are approved and developed, and provided that we are not faced with a serious "technological surprise" on the part of the Soviet Union.

The Peoples Republic of China

It is difficult to assess either the strategic nuclear threat posed by the Peoples Republic of China, or how that threat will evolve through the 1970's. This is true primarily because we lack complete information on the state of their ICBM development, the mix of strategic and theater nuclear delivery systems that may ultimately be deployed, and their development and production problems. The Chinese have not disclosed their strategic doctrine or their allocation of resources to ICBM development.

But this much is clear. The two Chinese space satellite launches during the last year and a half, and the approximately one dozen nuclear tests since 1964, indicate a fairly high degree

of sophistication in both missile and warhead development. The two space satellites were probably orbited using a multi-stage vehicle based on their IRBM, and therefore should be considered as part of China's progressive development of an ICBM. We have not as yet been able to confirm the initial flight testing of an ICBM, although a reduced-range testing of an ICBM system may already have occurred.

We cannot state with confidence just when China will have an ICBM capable of striking the continental United States, but it is estimated that deployment could not occur before 1975, with some 10-20 missiles being deployed by mid-1976.

The Chinese have no intercontinental heavy bomber force, and do not appear to be developing one.

The Chinese are known to be interested in nuclear-powered submarine technology, and probably have the capability to develop a prototype nuclear-powered attack submarine in the next several years as part of a program leading to development of a nuclear-powered, ballistic missile submarine. Neither nuclear-powered, ballistic missile submarines nor their associated missiles, however, are likely to be available until the last half of the decade.

2. Theater Nuclear Threat

The Soviet Union

We now turn to the threat posed by Soviet theater nuclear forces. Theater nuclear war is that which involves the use of theater nuclear weapons by or against U.S. forces or our allies, but does not include nuclear attack on the U.S. We seek to deter this type of conflict through the threat of the use of theater nuclear weapons and the capability for escalation.

Soviet theater nuclear forces include about 700 ballistic missile launchers (including medium and intermediate range missiles, as well as the SS-11 dual-purpose missile) and about 850 tactical surface-to-surface missile launchers assigned to their ground forces. In addition, their large medium bomber force of about 700 aircraft in long range aviation and 500 aircraft in naval aviation are capable of carrying nuclear weapons, as are approximately 1,100 light bomber and fighter bombers in the tactical air forces. Soviet naval forces, both surface and subsurface, also carry nuclear-capable missiles. There are also small numbers of the short range SHADDOCK and SCALEBOARD missiles.

A great many aircraft in the Soviet tactical air force possess a nuclear weapon delivery capability. In addition to the multi-purpose FISHBED (MIG-21) fighters, this total includes BREWER (YAK-28) and BEAGLE (IL-28) light bombers and FITTER (SU-7) fighter/bombers, which appear to be the primary tactical air nuclear delivery vehicles.

In theater nuclear capable naval forces, the Soviets have continued a steady buildup in their three western fleets -- surface and subsurface -- for operations against NATO navies, NATO sea lines of communication and coastal targets. These forces include their two ASW helicopter ships, as well as other major surface combatants, submarines and small patrol boats and submarine chasers equipped with possible nuclear capable surface-to-surface and/or surface-to-air guided missiles.

The Peoples Republic of China

At the present time the theater nuclear strike capability of the Peoples Republic of China rests primarily in its small but growing fleet of TU-16/BADGER medium bombers. These aircraft can operate from numerous airfields in China, and can reach targets up to 1,650 nm away without refueling when carrying a normal payload.

The growth of the Chinese nuclear strike capability has been remarkable, given the short time it has been in existence and the formidable obstacles that had to be overcome.

In mid-1970, for example, the Chinese had a small number of TU-16s. However, series production will account for a substantial number by mid-1972.

China is now focusing on the development of liquid-fueled ICBM/IRBM systems. There is some evidence that the Chinese are engaged in the deployment of solid fuel missiles, but there is no good basis for estimating specific dates for production or deployment. A few MR/IRBMs may have been deployed. We expect to see a modest force of MRBMs and IRBMs deployed this year.

Development of a regional nuclear capability would require an emphasis on IRBMs rather than MRBMs. Moreover, even though we regard Chinese theater nuclear capabilities as primarily deterrence-oriented, the range and warhead yield of the missile force and the expansion of the TU-16 fleet are significant. At present, the Chinese missile threat encompasses most cities and other area-type targets in South and East Asia and a substantial part of the USSR. We believe that the Chinese could begin deployment of an ICBM with a range of 3,000 nm or more, capable of striking all or most of the USSR, by 1975.

During the coming year we will be examining, in even greater depth than previously, the growing Chinese nuclear capability. These studies will be based on what we can learn about technical characteristics, deployment and plausible areas of intended use.

3. The Theater Conventional Threat

We have defined theater conventional warfare as that which occurs when the Soviet Union or the PRC are involved in direct conflict with the United States.

As I mentioned earlier, we would expect all Soviet Union forces to be used should a theater nuclear conflict occur, but in addition Soviet forces are fully capable of taking part in conventional conflicts, as well as in the projection of Soviet presence outside the immediate Eurasian continent.

Over the past year, we have seen Soviet and other Warsaw Pact forces continue their growth both in quality and quantity. The Soviets now have about 160 divisions, 60% motorized rifle, 35% tank and 5% airborne. This total includes many divisions deployed along the USSR-Chinese border where a buildup has been underway for the past few years. However, Soviet divisions are appreciably smaller in personnel than their U.S. counterparts at full strength. The Soviets allocate a considerably smaller portion of their active military manpower to support functions than do we. They seem to rely upon quick mobilization of civilian resources for support.

Two new Soviet tanks probably are in production and will be entering the operational forces in large numbers in coming years.

Over the past several years, the Soviet Union has continued to build up its forces facing the PRC along the Sino-Soviet border. Despite this buildup, however, the capability of Soviet military forces opposite NATO has not been reduced. It is important to note that all of the Soviet divisions in East Germany, Poland and Czechoslovakia are still being maintained in a high state of readiness.

We believe there will be qualitative improvements in the general purpose land forces of the Warsaw Pact nations over the next decade, but we see no evidence to indicate any substantial changes in their contribution to overall Pact capabilities. Barring disruptive political developments, we believe the Soviets will continue to place emphasis on the quality of East European forces opposing NATO.

A gradual buildup in the quality of tactical aviation will probably continue for the next few years. So far as we can determine, the force at the beginning of this year consisted of some 4,000 aircraft in combat units with about 1,800 more in training units. Approximately 2,000 aircraft at the present time are assigned to units that do not have a primary ground attack mission.

As I reported last year the Soviets have developed several new aircraft which could satisfy their requirement to replace obsolescent ground attack fighters, light bombers, and improve their capability to shield ground forces from air attack. These new aircraft reflect a trend towards more versatile aircraft capable of carrying larger conventional payloads as well as nuclear weapons, in addition to providing improved air defense and reconnaissance capabilities. Most of the current tactical aircraft, such as FITTER, FISHBED, and BREWER, began to enter service in the early 60's to meet nuclear war requirements -- but due to range and payload limitations are poorly adapted to conventional war tasks. The variable geometry wing (VGW) FLOGGER, now entering the inventory has improvements in loiter time, range, low altitude capabilities and dispersal characteristics over the FISHBED. The FITTER B, a VGW version of the FITTER A offering improvements as a weapons delivery platform, is also now entering service. FLOGGER also has excellent capabilities as a fighter bomber. The FOXBAT should be in service in tactical aviation in 1973. A few are probably already operating in this role with the Soviet air contingent in Egypt. The introduction of these various systems should result in a smaller but more capable force with greater flexibility by the end of the decade.

Since 1958, the Soviets have put into operation in their Navy, eight classes of long-range surface combatants, five classes of submarines and three classes of patrol boats, all of which are missile-equipped. The Soviets have pursued a vigorous cruise missile research and development program which has resulted in the operational deployment of several different air-to-surface and surface-to-surface missiles.

The Soviet naval air force has not developed new aircraft to carry anti-ship air-to-surface missiles, but uses modified long and medium range bombers of long-range aviation. These aircraft are carried in the inventory of the naval air force.

In order to employ these anti-ship weapons systems effectively, the Soviets have developed a significant ocean surveillance capability. The Soviets have demonstrated in several exercises an ability to conduct a coordinated attack involving aircraft, surface ships and submarines against simulated U.S. surface combatants.

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Although the Soviets have made significant advances in their Navy there remains some basic deficiencies and constraints in the use of these forces. The Soviets must contend with a paucity of all-weather ports, a lack of air cover when the fleet operates far from the Soviet home land and a lack of adequate open-ocean replenishment ships. Consequently, Soviet naval forces have significantly less military capability when operated far from the Soviet home land.

Nevertheless, our ability to defend against Soviet cruise missile systems, particularly in confined bodies of water, has not kept pace with the growth of the Soviet threat. Thus, we are initiating a number of programs aimed both at modernizing our naval forces and developing adequate means of defending against their cruise missiles. I will discuss some of these programs in a later section; Admiral Zumwalt, in his presentation to Congress, will describe in detail a number of these programs designed to counter the Soviet threat.

The Soviet Union continues to improve its tactical submarine fleet. The introduction of nuclear powered cruise missile attack classes has added a new dimension to submarine warfare. Additionally, since 1968, several more new submarine classes have been introduced.

With regard to lift forces, the Soviets have increased their military air transport capability to include the COCK (AN-22) heavy logistic transport; a few are now operational with transport units. The AN-22 can carry nearly 100,000 pounds of cargo to a radius of 2,800 nm, or 175 troops to a radius of some 5,000 nm. Additional CUB medium transports and HOOK heavy helicopters are being added to the force. A new heavy jet transport, CANDID, somewhat similar to our C-141, has been developed and will likely soon be available.

U.S. and allied forces, in consonance with the Nixon Doctrine, share the responsibility for the theater conventional deterrent, including air, ground and naval forces. Our force planning takes this interdependence into account, as it also recognizes the U.S. fiscal and domestic political realities and the major political concerns of each of our allies. As important as these non-military realities are, however, we must remember that our policy of maintaining the military balance vis-a-vis the Warsaw Pact represents, contrary to the opinions of some, a most prudent course. The North Atlantic Alliance has maintained the peace in Europe for twenty-five years.

Our assessments indicate that the current force balance in NATO can be maintained and that an effective deterrent does exist. As we

move to implement the President's Strategy for Peace, the lessons we have learned in Europe will not be ignored; we intend to maintain and improve our force capabilities in NATO, given a similar effort on the part of our European allies.

Our friends and allies in ASia face a threat of a different nature. Not only are the Peoples Republic of China, North Korea, and North Vietnam capable of launching full-scale conventional attacks against nearby countries, they also foment guerrilla warfare, sabotage, espionage, and subversion throughout the area.

The Chinese army of some 2.5 million men, a well-balanced force containing 150 combat divisions, is essentially the same as it was last year. But it is continually being modernized and upgraded. The Air Force (including the Navy air arm) can muster over 3,000 jet fighters (several hundred more than last year) and approximately 350 light and medium jet bombers (up by more than 10%). The offensive strength of the Navy centers on a force of over 40 diesel-powered attack submarines -- of which a major portion are medium-range R-class. Like the Army and Air Force, the Chinese navy is concentrating on developing sophisticated weapons systems such as guided-missile destroyers and missile-equipped coastal patrol craft.

Logistic constraints -- and the necessity of providing forces to meet the Soviet threat -- remain and make it unlikely that the Chinese would undertake operations on more than one front. We estimate that a multi-front conflict could be carried out successfully only if China's warmaking capacity and lines of communication remain undamaged.

4. Subtheater/Localized Threats

Subtheater conventional wars do not involve the United States in direct conflict with either the USSR or the PRC. They could result, for example, from aggression by North Vietnam, North Korea, or they could involve a conflict in the Middle East between the Arab states and Israel.

We are grateful for the ceasefire in the Middle East and continue to hope that the U.S. initiative for peace will be successful. The obvious immediate threat in the Middle East is the constant danger of an Arab-Israeli war, which could expand to involve the Soviet Union and the U.S.

The balance of power in the Middle East obviously has a vital bearing on U.S. security interests. Moreover, the Soviets have

deeply involved themselves in several of the Arab states -- particularly Egypt, where they have stationed both personnel and equipment to bolster the Egyptian armed forces.

As the President has explained, our assistance programs are designed to preserve the balance of military power in the Middle East.

Our objective is to shift primary responsibility for deterring or fighting subtheater or localized conflict to our allies and friends. Our help will be primarily in the form of other than ground force elements, but could include force deployments under special circumstances.

The country or ally threatened must increasingly bear the primary burden -- particularly the manpower burden -- of deterring subtheater or localized warfare.

North Korea and North Vietnam possess strong military forces. Either of them could add substantially to the theater conventional threat posed by Chinese forces, if jointly involved in a conflict. Without Chinese involvement, however, neither nation is capable of posing a theater-level threat in Asia.

After the Soviet Union and the PRC, North Korea is the most powerful communist nation in Asia. Supplied in large part by the USSR and to a lesser extent by the Peoples Republic of China, it possesses a modern and continually improving military establishment maintained at a high state of combat readiness. The Army of about 360,000 men has 25 division equivalents and could engage in initial offensive operations without outside aid. The Air Force includes about 450 jet fighters and a significant number of small transports. Naval capabilities remain limited and are oriented mainly toward coastal defense and hit-and-run attacks against the Republic of Korea. Although aid from the USSR and/or the Peoples Republic of China would be necessary to support sustained large-scale North Korean military operations, Pyongyang has the capability of undertaking a variety of unconventional warfare operations independently.

The North Vietnamese threat in Southeast Asia, although degraded somewhat by the commitment of 12 division equivalents to the Indochina war, nevertheless remains formidable. The Army has an in-country strength of about 315,000 (including six infantry divisions), several thousand artillery pieces, and a large number of tanks. The Air Force has more than 200 jet fighters -- over one-third of which are MIG-19s/21s -- and over 100 transports and helicopters. The Navy is the weakest component among the North Vietnamese services, consisting of motor gunboats and motor torpedo boats.

The immediate threat to our allies and friends in Indochina results from North Vietnamese aggression and Hanoi-sponsored communist insurgency in the region. At the present time, there are at least 150,000 North Vietnamese/Viet Cong (NVA/VC) personnel in the Republic of Vietnam, more than 60,000 VC/NVA and Khmer Communists (10,000-15,000) in Cambodia, and at least 120,000 NVA and Pathet Lao in Laos.

The war against the Republic of Vietnam remains North Vietnam's first priority. The major threat derives from enemy capabilities to launch large-scale attacks. Cambodia is likely to be the scene of continued enemy military and psychological pressure.

The continuing rise in the communist insurgency in Thailand provides a clear example of the ever present danger of modern revolutionary warfare, in which external communist influence and support fans problems arising from ethnic and social class differences into internal political subversion and thence to open armed aggression.

Armed insurgents operate from bases in much of Thailand's border area. The United States policy has been one of helping the Thais develop the ability to help themselves. This they are now learning to do -- particularly in the military techniques of aerial resupply, coordination of ground and air forces, and the use of fire support bases to assist maneuvering ground forces. There is also better intelligence, slowly improving police-military relationships, and the use of air-mobility -- all without the use of U.S. support troops.

5. Communist Military Assistance

Communist military assistance programs have come to be important instruments of Communist foreign and military policies. Thus, they impact directly upon our own security interests and upon the maintenance of international stability.

Since 1955 the Communists have supplied about $26 billion in military aid. The Soviets have supplied more than 85 percent of this aid, the East Europeans 8 percent, and the PRC about 7 percent. Of the total, over $16 billion has been supplied to other Communist governments -- most notably those of East Europe, North Vietnam, and North Korea. Almost $10 billion has been supplied to the less developed countries of the Third World, primarily in the Middle East, and to India, and Pakistan.

While Chinese military aid to underdeveloped countries has been scattered, over 90 percent of Soviet military aid -- and

practically all of that aid committed in recent years -- has been given to countries situated in an arc running from the Eastern Mediterranean, through the Red Sea, to the Arabian Sea. In this arc are countries which either control the strategic Suez waterway, contain the bulk of the Free World's oil reserves, or are adjacent to the southern borders of the USSR.

About 60% of intra-Communist military assistance provided during the 1955-1971 period is accounted for by arms transfers between the USSR and Eastern Europe. The Soviets provided almost all of this aid, with the level of their assistance averaging over $500 million annually since 1961. Poland and Czechoslovakia have annually provided a smaller, but sizeable amount of aid to other Warsaw Pact nations.

North Vietnam has received about 70% of its military aid from the Soviet Union, most of it from 1966 through 1971, and about 30% from the Peoples Republic of China. North Korea, another major recipient, received all but a small portion of its military aid from the Soviets. Since 1966, the Soviets have provided North Korea significant sums annually for force modernization. Soviet military aid to Cuba has been significant and is expected to continue at its present annual level for the next few years.

Almost 90% of Communist military assistance to non-Communist governments during the 1955-1971 period has been Soviet. Of this, over half has gone into the Middle East -- to Egypt, Syria and Iraq. The bulk of this aid has been provided since 1967, mostly to the UAR. The Soviets have also negotiated a military aid program valuing over $300 million with Iran and concluded in 1971 a new agreement with Egypt.

The Soviets have also conducted a sizeable military aid program in Afghanistan and India and have provided aid to the States of North Africa and the Horn -- areas adjacent to the major recipient countries in the Middle East. The Eastern European countries, together, have provided about $1.0 billion of aid to Third World nations.

The PRC has provided over $300 million to the non-Communist Third World, most notably to Pakistan and Tanzania. Most of this aid was supplied after the Cultural Revolution. We expect that the PRC military aid program will grow.

There are gaps in our information about the purposes and scope of this sizeable Communist military assistance effort, and its impact cannot be precisely measured. In many cases, military

assistance is supplied to areas of obvious strategic importance to the donors -- such as Soviet aid to the Warsaw Pact nations or Chinese assistance to North Vietnam -- and is clearly security as well as politically oriented. In many other cases, the motives have appeared more specifically supportive of broad policy purposes -- such as Soviet aid to Cuba and Chinese programs in Tanzania.

Predominantly, however, Communist military assistance programs are selective, and constitute primary components of a campaign for influence and leverage. They provide the Communists with a direct, high impact conduit to the centers of authority in the recipient nations. Such aid has to a considerable extent, served to increase political leverage and thus to affect the behavior of assisted governments. Furthermore, these programs are often geared specifically to weaken relations between the U.S. and the country concerned. When tactically directed, as it typically is, to particularly nationalistic governments, Communist support can contribute substantially to the weakening or elimination of Western influence in target countries. In the past decade it has, in particular, facilitated an expansion of communist commercial and diplomatic presence in the Middle East, South Asia, and North Africa.

Influence is, of course, a subtle and largely immeasurable quality. Having procured Soviet arms, for example, a number of states now are heavily dependent on their donors for new logistical and technical support. At the same time, military assistance has enabled the Communist countries to establish rapport with recipient country military leaders and junior officers. In some cases improved access to recipient country ports, airfields and other facilities has apparently resulted from such programs.

A major part of Communist assistance programs are the low-interest, long-term loans they offer. While the easy terms are attractive, much of the aid is tied to purchases from or barter arrangements with the donor. Such arrangements can restrict the recipient's flexibility with regard to economic development. In addition, most military assistance offers include the services of military assistance training teams from the donor nation, or an invitation to assisted military personnel to come to it for training. The recipient armed forces are thus exposed to political as well as technical influence over their country's military establishment. The number of Communist military personnel in developing countries increased by about 40 percent between 1969 and 1971 -- from approximately 7,000 people to over 10,000. In their advisory capacities, they have played key roles in modernizing and reorganizing their host's military establishment.

A major impact of Communist military assistance frequently has been to upset regional military balances, introducing new sources of tension into already unstable areas. While Communist leaders are aware that their aid programs have on occasion encouraged some countries to engage in political and military activity that they otherwise might not have undertaken, they continue to supply aid to such countries if it fits their broad policy goals. Furthermore, as the performance of the PRC and the USSR in the India-Pakistani hostilities of December 1971 indicated, we continue to be faced with the prospect that the Communist powers will use military assistance as a means to play out their own rivalries, without regard for the effect on regional balances.

The United States must and will remain responsive, through strength and mutual cooperation, to challenges to our security and peace. But we wish, equally, to be alert to the possibilities of reducing the wasteful and destructive competition in providing conventional weapons.

The President has called for an end to confrontation and a beginning of cooperation. One element of that change could be the exercise of mutual restraint in military assistance programs. No nation can, in the long run, be served by adding to instability or increasing the risks of violence which could escalate into great power confrontations. Military assistance programs should strengthen rather than weaken regional balances and national development; they should respect the needs and national pride of the recipients, rather than make of them pawns in a greater international contest; they should, above all, reflect a genuine intent among major arms suppliers to bring conventional as well as nuclear weapons under control.

6. The Challenge to Technological Superiority

Forces in-being and military assistance are only part of the military threat to our nation's security. The technology behind the capabilities of our potential opponents, particularly the Soviets, is of real concern to us. With the continuing technological effort on their part, we must expect the Soviets will be capable of reducing our technological lead in some areas, and at some point in the future, we could even lag in certain critical areas.

Since the late 1960's Soviet expenditures for technological development have increased at an average annual rate of more than 10 percent. For 1972, as an example, the announced science budget of 14.4 billion rubles is almost nine percent greater than 1971 expenditures. A major portion of these science expenditures are

believed earmarked for military RDT&E and space exploration. Any substantial increase in science outlays would therefore include an increase in these military related technological efforts.

With a technological effort of that size, and without an appropriate effort on our part, we could lose our technological superiority, if we do not take and gain support for adequate offsetting actions.

Although these comments relate primarily to our estimates of funding associated with Soviet research, the same general trends are evident with regard to other measures -- manpower, facility growth, and basic research efforts. Given the fact that theirs is a closed society, if the Soviets were to take the technological lead it would be much more difficult for us to interpret the intelligence information we acquire, and to make confident decisions based on this information.

There may be other, perhaps dramatic changes as a result of the growth of Soviet technical capabilities, which could emerge unexpectedly from their closed society, and which could create urgent problems for us in the future. These surprises and consequent problems could occur across the spectrum of capabilities -- as unexpected threats to strategic force survivability, as new tactical weapons and surveillance systems which we might not understand or be able to cope with, or as major improvements in existing systems.

Some of the more important Soviet research and development efforts deserve mention. Admiral Moorer and Dr. Foster provide more detailed descriptions in their statements, as do the Service Secretaries and Chiefs.

-- While the Soviets probably have not tested MIRVed missiles thus far, they have conducted many tests of the SS-9 with Multiple Reentry Vehicles (MRVs) since flight testing began in August, 1968. The last MRV tests were in late 1970.

-- Extensive testing of the MOD 3 version of the SS-9 since 1965 is believed to be for development of either a fractional orbit bombardment system (FOBS), a depressed trajectory ICBM, or a system with both capabilities.

-- Flight testing of SS-11 modifications commenced in 1969.

-- Development of a new SLBM, designated the SS-NX-8, continues.

-- The Soviets have accelerated their SLBM submarine construction.

-- Soviet development of a new swing-wing bomber continues. This new variable-geometry wing (VGW), supersonic dash bomber, has been designated the BACKFIRE. It has a gross weight of more than twice that of our FB-111. There is a probability that it has a capability for inflight refueling. With refueling it could reach virtually all U.S. targets. Based upon the scope and pace of the BACKFIRE development program, we assess that this new bomber could become operational in the mid-1970s.

-- During the past three years, we have noted testing of what appears to be an improved GALOSH ABM missile. It has a controlled coast capability and restartable engine providing a higher degree of flexibility in countering incoming RVs.

-- The Soviets have deployed a wide-spread space tracking system within the territory of the USSR. This system would provide the Soviets with the capability of predicting the position of near earth orbiting satellites.

-- New major surface combatants are currently under construction at Soviet shipyards.

-- The Soviets are continuing to develop improved high fragmentation conventional weapons, and within several years the Soviets could have sizeable operational inventories of improved conventional artillery shells, bombs, missile warheads, and ASW weapons in theater force units. From our experience in Vietnam, we know that Soviet and PRC produce excellent foot mobile weapons: small arms, rockets, projectiles, grenades; and their surface-to-surface rockets are cheap, easy to maintain and quite reliable. Continued improvements are being made in these weapons and they are being distributed throughout the world.

I know you will agree that these examples show a very active and productive Soviet RDT&E program.

In addition to the assessments of Soviet RDT&E which have been conducted, we have examined the Soviet decision-making process for weapons system acquisition, and the relative costs for procuring comparable weapons systems in the U.S. and the Soviet Union. These investigations are continuing and will receive a new emphasis as we expand our Net Assessment capabilities. Preliminary indications are that Soviet industry receives the very highest priority within their economy and that the defense sector is probably the most efficient and productive of any part of the Soviet economic system. In addition, it seems clear that the Soviets are apparently allocating a higher percentage of their defense budget to the high technology area of research and development and space than is the U.S.

We cannot guarantee that technological surprises and problems will not develop, but to the extent possible, we are incorporating flexibility in our own development programs to hedge against increased threats or unexpected failures in U.S. systems. We also believe that our technology programs should result in diversified U.S. military systems, so that one adverse event is not likely to impact heavily on the U.S. deterrent posture.

Dr. Foster, in his presentation to the Congress, will enlarge on the technological challenge that we face from the Soviet Union, but I will note here that the Soviets continue to make a substantial investment in their RDT&E system. The Soviets certainly are aware of the growing U.S. domestic pressure for Defense RDT&E spending reductions and the Soviets have decided to continue their steady growth rate in expenditures for science and technology.

DEFINITION OF TECHNOLOGICAL SUPERIORITY

Senator CASE. I don't want to delay the hearing, but I wish that you would develop further what is meant by "technological superiority." This is the kind of a thing that seems to me could lead to indefinite escalation.

Secretary LAIRD. By technological superiority, I don't mean the deployment of systems, but maintaining the technological base and the superiority of our basic research through the support of our scientific facilities and community.

We must be in a position where we do not fall behind in technical know-how and scientific knowledge which is so important. It is very difficult for us to see what the Soviets are developing. We can only see a system in the Soviet Union when it is being tested or deployed, and then it is too late. I think it is most important from the standpoint of our security that we maintain this technology and scientific base.

Senator CASE. I don't think anyone would disagree about our technical capability. That is very important, but that isn't quite what I get from your statement, which seems to me to go the deployment of weapons systems.

Secretary LAIRD. I get into that in the next chapter of the report.

Senator CASE. By technological superiority you don't mean the deployment of weapons systems?

Secretary LAIRD. Not as far as technological superiority is concerned. I am talking about the scientific know-how and the technology which we must possess here in the United States because we are an open society. We are competing with a closed society, and it is very difficult for us to know where they are in military technology.

There is a great effort generally you know, to discount the importance of basic research. When I was in the Congress I used to be criticized by some because in the Defense Appropriations Act as well as the health, education, and welfare bill, I was always for putting a lot of money in the basic research area. I think this is important to our country, and you will not always get industry to support that particular field of knowledge.

Senator CASE. You wouldn't always have what we had in World War II—a base of European scientists which we drew upon so very heavily, as you know.

STATUTORY MANDATE THAT ALL RESEARCH HAVE MILITARY APPLICATION

Secretary LAIRD. At the present time, any research project which we conduct must have a relationship to a military application. Now, I realize that this Congress in its wisdom feels that the Department of Defense should not spend any money for research, whether it be in the basic area or any other area, that doesn't have a military application.

Well, I interpret that directive from the Congress in the broadest terms, because I feel that in the basic research area, in particular, you can't absolutely identify the military application of every bit of basic research you are supporting. So I interpret that congressional

directive in a very, very broad fashion. I hope that the Congress will allow me to continue with that interpretation.

Senator ALLOTT. That is with respect to basic research?

Secretary LAIRD. Yes.

Senator SYMINGTON. And applied research?

Secretary LAIRD. As for applied research, it is a little easier to make that determination.

Senator SYMINGTON. But you are not cutting down?

Secretary LAIRD. No.

SICKLE CELL ANEMIA RESEARCH

Senator CASE. I think it is very hard to understand just what you mean. Could you give an illustration so we can know? My question doesn't represent any disagreement with this at all. It is a matter of trying to understand what is meant.

Secretary LAIRD. Let me give you, as an example, the sickle cell anemia problem which exists among black people. I have gone forward and approved research programs in that area which people might say should be handled by the National Institutes of Health. They weren't being handled as adequately as I thought they should be, and I believe it has a military application because we do have and are going to continue to have a lot of black people in the Air Force, the Army, the Navy, and the Marine Corps.

So I use a very liberal interpretation in approving grants in that particular area, and pilot control projects which are going forward in all of the services.

I use that as an example.

Some people would say that violates the congressional intent. I don't believe it does. It is going to make a great contribution as far as the country is concerned, too, but I think it is an important thing for us to be doing.

Senator CASE. This is not said critically. It is just trying to understand where the line is drawn and where it ought to be drawn. As you know better than anyone, some feel very strongly that basic research ought to be out of the hands of the military.

Secretary LAIRD. It is hard to divide up all of these programs in our universities and our colleges and various laboratories and absolutely label each one. I think we are trying to do the best we can, Senator Case, in this area.

UNEXPLAINED USAGE OF TERM "TECHNOLOGICAL SUPERIORITY"

Senator CASE. My basic question is still not directly related to this, but what is your meaning when you talk about technological superiority? If that isn't correctly understood, it sounds like an indefinite escalation, because we have to be on top and the enemy feels he has to be on top, and so you never stop.

RUSSIAN RESEARCH AND DEVELOPMENT

Secretary LAIRD. I am not talking about that in this context here. On page 93 of my classified report, I provide a list of some of the more important Soviet R. & D. efforts, which it might be well to put in the record at this point, even though I will cover it a bit later.

(The list follows:)

Some of the more important Soviet research and development efforts deserve mention. Admiral Moorer and Dr. Foster provide more detailed descriptions in their statements, as do the Service Secretaries and Chiefs.

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New major surface combatants are currently under construction at Soviet shipyards.

The Soviets are continuing to develop improved high fragmentation conventional weapons, and within several years the Soviets could have sizeable operational inventories of improved conventional artillery shells, bombs, missile warheads, and ASW weapons in theater force units. From our experience in Vietnam, we know that Soviet and PRC produce excellent foot mobile weapons: small arms, rockets, projectiles, grenades; and their surface-to-surface rockets are cheap, easy to maintain and quite reliable. Continued improvements are being made in these weapons and they are being distributed throughout the world.

UNEXPLAINED USAGE OF TERM "TECHNOLOGICAL SUPERIORITY"

Chairman ELLENDER. You will get to it later?

Senator CASE. I don't want to interfere with the orderly presentation. I will just note that the question is still an open one.

TOTAL OFFENSIVE FORCE LOADINGS

Does the category "Total Offensive Force Loadings" on page 55 of the classified statement include these loadings attributable to the SRMA carried by the B–52 and F–111? If not, why not? Does this category include warheads deliverable by U.S. aircraft based in Europe—and if not, would you please provide an estimate of the latter number?

Secretary LAIRD. The category "Total Offensive Force Loadings" includes SRAM carried by B–52 and FB–111 strategic aircraft; however, it does not include nuclear bombs which could be carried by U.S. aircraft based in Europe. [Deleted].

Chairman ELLENDER. You may proceed, Mr. Secretary.

TOTAL FORCE PLANNING

Secretary LAIRD. Net assessment, as I have indicated, is one essential of effective long-range planning. The other essential is total force planning which I described at some length in my report last year. As I said then:

> In Defense planning, the Strategy of Realistic Deterrence emphasizes our need to plan for optimum use of all military and related resources available to meet the requirements of Free World security. These Free World military and related resources—which we call "Total Force"—include both active and reserve components of the U.S., those of our allies, and the additional military capabilities of our allies and friends that will be made available through local efforts, or through provision of appropriate security assistance programs.

I am confident the Nixon doctrine peacetime force structure in our 5-year defense program will be adequate if Congress votes the necessary funds to make total force planning effective. They include funds for maintaining:

Strategic Sufficiency
Technological Superiority
Weapons Modernization
Sufficient Manpower Levels
Strong Guard and Reserves
Adequate Operations and Maintenance
Security Assistance
Total Resource Utilization

In fiscal year 1973 we propose significant increases in funding for: Strategic nuclear forces, including sea-based missile deterrent forces such as the Undersea Long-Range Missile System, advanced and improved command and control, the new B–1 strategic bomber, and continued deployment of Safeguard. These increases are recommended to maintain our strategic sufficiency against a growing threat.

Research and development, with emphasis on diversification, hardware development, including prototyping, basic research and exploratory development, and operational test and evaluation, to maintain technological superiority.

IMPROVING GENERAL PURPOSE DETERRENT FORCES THROUGH WEAPONS MODERNIZATION

Modernizing naval forces, including long leadtime funding for a fourth nuclear aircraft carrier, increased procurement of nuclear attack submarines and new sea control ships, to maintain a strong Navy.

Development and procurement of the Air Force F–15 and the Navy F–14 aircraft, modification and improvement of the Army's M–60 tank, procurement of Lance missiles, and continued development of attack and heavy-lift helicopters, to maintain a balanced and effective conventional deterrent in partnership with our allies.

Revitalizing Reserve components by placing a new emphasis on a strong Guard and Reserve and supporting increased modernization and improved readiness and full manning and equipping to make U.S. Forces more effective under our total force concept.

Military Assistance, for improving allied capabilities for self-defense through a new emphasis on security assistance to make free world forces more effective under our total force concept.

Manpower, including pay, housing and other benefits to continue the momentum to zero draft and an all-volunteer force.

MILITARY ASSISTANCE TO WESTERN EUROPE

Chairman ELLENDER. Does that mean that you want to increase our assistance to our allies in Western Europe?

Secretary LAIRD. We are not giving any military assistance to our NATO allies, except for Greece and Turkey, and a small program in Portugal?

Chairman ELLENDER. But your statement, "for improving allied capabilities", means Western Europe, too, doesn't it?

Secretary LAIRD. We are referring to countries in Asia like Korea and Cambodia.

Chairman ELLENDER. I was talking about Western Europe.

Secretary LAIRD. There is no military assistance for most countries in Western Europe.

AREA RESPONSIBILITY FOR PROGRAMS

Chairman ELLENDER. In devising all of this, to what extent have you discussed the area of responsibility in regard to assisting us in providing the programs that you are talking about now?

Secretary LAIRD. I have discussed it very fully with them through the Defense Planning Committee, and I believe we are making substantial progress.

Chairman ELLENDER. What progress are you making? You said awhile ago that you got them to make certain contributions, amounting to $1 billion over a period of 5 years.

Secretary LAIRD. This is in addition to that.

Chairman ELLENDER. What else is that?

BARRACKS IMPROVEMENT PROGRAM

Secretary LAIRD. That is the barracks improvement program.

Chairman ELLENDER. That is on German soil. I am talking about helping us to maintain this.

Secretary LAIRD. For a long time, every improvement that was made there was made with U.S. dollars. We have changed that direction in the last 12 months, and German funds are being invested in these improvements.

EUROPEAN DEFENSE IMPROVEMENT

In addition to that, we have the European defense improvement program, which provides a contribution of some $1 billion over 5 years and in which the United States will not participate. We will participate in the benefits, but we will not make a monetary contribution to that program.

EUROPEAN INCREASED CONTRIBUTION TO THEIR DEFENSE

Chairman ELLENDER. Is this $1 billion that you speak of apart from the other billion dollars that you talked to us about 2 months ago?

Secretary LAIRD. Yes, it is. The second billion dollars is the increased contribution which the European allies have agreed to make as far

as their defense budgets are concerned, and I discuss that in some detail in this report.

Chairman ELLENDER. Over what period of time?

EUROPEAN DEFENSE IMPROVEMENT PROGRAM

Secretary LAIRD. The EDIP program will cover a period of 5 years.

Chairman ELLENDER. You say we will not participate?

Secretary LAIRD. We will not participate.

Chairman ELLENDER. What does that include?

Secretary LAIRD. That includes various programs to improve the combat effectiveness of the forces in Europe. One of the things is aircraft shelters, another thing is communications facilities, so that we have better communications within the forces. This is one of the problems that we have at the present time. These will all be improvements in the combat effectiveness of the NATO Forces. Let me insert in the record a list of improvements in the contributions of our NATO allies to the defense of Europe.

(The information follows:)

Improvements in the contributions of our NATO allies to the defense of Europe are noted below:

(1) *EuroGroup Efforts.*—The EuroGroup (10 countries) reported the following efforts on their part in the December 71 Communique:

(*a*) *European Defense Improvement Program (EDIP).*—The full $420 million Special Infrastructure fund over five years has been covered fully by specific national pledges. Over two thirds of the total aircraft shelter program either is under construction or has been programmed. Action on all special national force improvements is going ahead on time and aircraft deliveries to implement the intra-alliance aid element are well advanced.

(*b*) *Measures in "Alliance Defense Study for the Seventies" (AD 70's) Areas.*— The EuroGroup reported on equipment plans which fulfill AD 70's priorities in two groups: those programs being implemented in 1971–72 (i.e., systems entering the forces); and those programs which have been initiated, or firm procurement commitments undertaken, in 1971–72 (i.e., to enter the service through 1976). Those improvements are shown in the following table:

ALLIED EQUIPMENT IMPROVEMENTS

	Programs being implemented	Programs being initiated
Army:		
Main battle tanks	1,100+	600
Heavy SP artillery pieces	300+	
Antitank weapons	700	8,500
Combat vehicles, AFV's, APC's	600+	3,500+
Navy:		
Guided missile destroyers	2	11
Other destroyers and ocean escorts	5	17
Nuclear fleet submarines	3	3
Other submarines	10	22
Maritime patrol aircraft	27	18
ASW helicopters	25	44
Guided missile fast patrol boats	4	45
Air Force:		
Modern combat aircraft	400	500
Heavy tactical transport aircraft	50+	20
Helicopters	200	130+
Antiaircraft guns	450+	3,000+

PORTION OF ALLIED DEFENSE BUDGETS DEVOTED TO MAJOR EQUIPMENT PURCHASES

[Percent of total defense expenditures]

	1971	1972	Percent change, 1971–1972, of absolute current dollars
Belgium	11.5	13.4	25.8
Denmark	13.4	12.6	
Germany	12.7	12.9	11.2
Greece	6.3	4.7	−23.5
Italy	15.5	14.9	2.4
Luxembourg	1.2	1.5	
Netherlands	11.9	13.2	18.7
Norway	15.7	15.9	10.1
Portugal	11.4	10.9	
Turkey	3.5	3.5	5.0
United Kingdom	15.7	17.3	10.4
Total NATO Europe	13.5	14.0	9.7

MUTUAL LIMITATION AGREEMENTS IMPOSING MUTUAL CONTRIBUTIONS

Secretary LAIRD. What I have been trying to stress with our European allies is that as we reach this period of parity, as far as strategic nuclear weapons are concerned, it is absolutely essential, until we can go forward with some sort of limitation agreements with the Soviet Union and the Warsaw Pact countries, that we have an adequate deterrent in Europe. It is a responsibility which they must share. The NATO treaty is a mutual treaty, a treaty in which they must make mutual contributions. I have tried to do that with the Japanese.

JAPAN

Now, I am not too popular in Japan, but the defense treaty which we have with Japan, which has been approved under our constitutional process by the U.S. Senate, provides that we have a mutual responsibility for defense of Japan. [Deleted.] We are providing for the entire nuclear umbrella as far as Japan is concerned. [Deleted.]

I think the Japanese have a responsibility in this defense area. It is a mutual treaty we have with Japan, and I am continuing to encourage the Japanese to share more fully the responsibilities under that defense treaty.

FRENCH PRODUCTION AND SALE OF MILITARY HARDWARE

Chaiman ELLENDER. How about the production of materials of war? Suppose war were to break out tomorrow. Where would our allies expect to get their hardware?

Secretary LAIRD. France is one of the largest producers of defense hardware in Europe today. France has gotten into this weapons systems business in a very big way. As a matter of fact, in South and Central America, France has sold over $500 million down there in the last 18 months. We are limited to about $75 million.

Chairman ELLENDER. I don't consider France as a NATO country any more.

Secretary LAIRD. But they are selling to our NATO allies, just the same. They have built up a military industrial base which is quite significant, and they will sell some $1 billion worth of military equipment outside of France this year.

Chairman ELLENDER. Such as what?

SALES TO SOUTH AND CENTRAL AMERICA: U.S. LIMITATION

Secretary LAIRD. That is aircraft, electronics equipment, primarily in the aircraft field. As you know, they are big now in South America. The Russians are also showing aircraft in South America, but they haven't made any sales yet. We went forward with the idea—I was in Congress, and I voted for it—of a limitation on sales in Central and South America. We thought that by placing a limitation on what we could sell from the United States, we would encourage them to use their resources for health and for education and in other domestic areas. I think that was a fine idea we had. I did vote for it.

But now that we have operated under it for a few years, I can see that it was absolute folly for us to put that kind of limitation in the bill. What it did was to cause these countries to spend considerable amounts in the way of spare parts and maintenance, and the French and the British have gone down there and have made the sales. It has affected our industrial base in the United States, particularly as far as military production is concerned, and we could save the South and Central American governments considerable amounts of money if we were still making some of our equipment available to them.

Senator ALLOTT. What we did was to increase the diversion from the health, education, and other programs, rather than helping them.

Secretary LAIRD. That is correct. That has been the result of what we did. I take responsibility. I voted for it. It was a mistake, and I think we should move in the other direction, because it has proven to be an error.

ALLY EXPECTATION OF UNITED STATES RESPECTING HARDWARE IN EVENT OF WAR

Chairman ELLENDER. Mr. Laird, the question I expected you to answer was this: If war were to break out, would not our Western European allies expect us to furnish most of the equipment? Or would they buy from France, or from other countries?

Secretary LAIRD. I would expect that we would sell more than any other nation.

Chairman ELLENDER. Sell, you say?

Secretary LAIRD. Yes.

Now, the NATO European nations have the economic capability to make these purchases, I feel. They have over 3 million men under arms in Europe, and annual defense budgets to taking over $25 billion. I think they have a capability to buy military hardware and military equipment. Let me provide a chart showing expenditures, GNP, and armed forces of NATO nations. You can see from it that they do have that capability.

(Classified information was separately furnished to the committee.)

Chairman ELLENDER. Why aren't these people adequately armed if they have that capability? On my visits, I know they weren't well equipped.

Secretary LAIRD. [Deleted.] I think our allies do have adequate stocks of food, petroleum oils and lubricants for an extended conflict. I would like to explain why for the record.

(The information follows:)

LOGISTICS CAPABILITIES OF OUR NATO ALLIES

Our allies have adequate stocks of food, petroleum, oils, and lubricants to last for an extended conflict given probable expenditure rates.

Items that are not military-peculiar such as trucks, cars, barges, rail cars, construction equipment, materials handling equipment, and other items are available in quantity from civilian resources should they be needed. This capability is one of our European allies' great strengths.

Ammunition and military-peculiar equipment must be on hand on D–Day in quantities which will sustain forces until resupply can be effected. [Deleted].

In equipment, the actual and planned changes that allies report in their national stockage objectives during the 1971–76 time frame indicate that they are taking positive action to make significant improvements in their forces. Data available in the 1971–76 Allied Force Plans show a 1.5 percent per annum increase in defense budgets in constant prices. The European Defense Improvement Program includes pledges of an additional $2 billion over the next five years. These plans have been corroborated by a number of sources. Some of our allies' 1971–76 force readiness improvements have been confirmed by contractual arrangements for major equipment acquisitions or deliveries. (See the following table.)

EUROPEAN DEFENSE IMPROVEMENT PROGRAM (EDIP)

$420 MILLION

NICS (NATO Integrated Communication System)
Aircraft Survival Measures (Shelters).

$450–500 MILLION

Retention of Ark Royal CVA–UK
53 CH 53 Helicopters—FRG.
4 JAGUAR Squadrons—UK.
1 Reserve Armored Car Squadron—UK.
Increase Northern Area Forces—Norway.
Reequip air transportation—Belgium.

$79 MILLION

Special financial aid (transport aircraft)—FRG to Turkey.

UNDEREQUIPPED EUROPEAN DIVISIONS

Chairman ELLENDER. I didn't mean that at all. I mean this: on a visit that I made in 1960 I found that none of those divisions were properly supplied. [Deleted.]

Secretary LAIRD. You were pleased with improvements you saw the last time.

Chairman ELLENDER. No, I wasn't.

Secretary LAIRD. I thought you were impressed with the change that had occurred.

Chairman ELLENDER. I was impressed in some areas, but the loss of France has concerned me a lot. Nor do I think Germany is progressing at full speed in the areas they should be improving.

Secretary LAIRD. Germany is improving. We came forward with a major sale of aircraft to Germany in the last year. The largest sale of a single item that has ever been made to another country was consummated this last year with the F–4 sale in Germany, and the joint production agreement that we have going there. We are negotiating with Greece on an order of F–4's. They will pay for this.

Chairman ELLENDER. In cash?

Secretary LAIRD. Actually we anticipate that this transaction will involve a cash downpayment, DOD credit and other credit from commercial sources. They are able to obtain credit from commercial sources.

STRATEGIC SUPERIORITY AND TECHNOLOGICAL SUPERIORITY

Senator SYMINGTON. I would like to associate myself with the remarks of Senator Case. I personally don't think there is any reason to think that we have technological superiority against the Soviet Union. I think technologically the Soviets have accomplished a great deal in the field of new weaponry. Moreover, I hope we don't emphasize the concept of technological superiority at the same time we admit that strategic sufficiency is now an adequate term. I am oversimplifying it, but I don't want to let that pass without commenting.

Secretary LAIRD. Thank you.

SUBCOMMITTEE RECESS

Chairman ELLENDER. It is now 12 o'clock, and we are now on page 15. I think that this is a good place to stop. We will recess until 2 o'clock this afternoon if that is agreeable?

Secretary LAIRD. Yes.

Could the chairman start his net assessment or his assessment of capabilities at 2 o'clock?

Chairman ELLENDER. Yes.

We will include your statement to provide a continuity.

The subcommittee will stand in recess until 2 o'clock.

(Whereupon, at 12 noon, the subcommittee recessed, to reconvene at 2 p.m.)

(AFTERNOON SESSION, 2 O'CLOCK, THURSDAY, FEBRUARY 24, 1972)

DEPARTMENT OF DEFENSE

STATEMENT OF HON. MELVIN LAIRD, SECRETARY OF DEFENSE—Resumed

COMPARISON OF RUSSIAN SUBMARINES AND U.S. POLARIS AND POSEIDON SUBMARINES

Chairman ELLENDER. The subcommittee will come to order.

Admiral Moorer, before Secretary Laird resumes his statement, I would like to ask you if you are in agreement with what Secretary of Defense Laird stated this morning, that the Y submarines of the Russians are comparable to our Polaris?

Admiral MOORER. I cannot give a "yes" or "no" answer. We are in the process, as you know, of converting 31 of the Polaris. So far, I think seven have been converted. This program will be completed about 1975. The Soviets, on the other hand, have, in operation, about 25 of the total Y-class submarines and about 17 more under construction.

[Deleted.]

The missile that is currently in the *Yankee* class submarine does not have the capabilities in terms of range or yield or MIRVing capability of the Poseidon missile. It is more like our Polaris A–1 and A–2. The submarine, on the other hand, is a new submarine [deleted].

Now, on top of that, as I will show you, the Soviets have a new missile [deleted]. We are waiting to see whether they are going to backfit it into the *Yankee* class, as we did with the Poseidon, or whether they are going to, in fact, build a new submarine for it and [deleted].

Chairman ELLENDER. Are they in operation?

Admiral MOORER. [Deleted.]

Chairman ELLENDER. The question I asked was simply whether you agreed with Secretary Laird that the Y-class submarines that the Russians have are about equal to our Polaris?

Admiral MOORER. Yes, sir; if you confine that to the ones that are operational.

Chairman ELLENDER. The Poseidon is, of course, much better than their Y-class submarine.

Admiral MOORER. [Deleted.]

Chairman ELLENDER. The second question I would like to ask is whether you are in accord with Secretary Laird on the decision that he had said was made by the Pentagon that no money was being requested for the expansion of the land-based missile program?

Admiral MOORER. Yes, sir; I think so. Would you like for me to give a reason?

Chairman ELLENDER. Based on testimony before this committee I have concluded that our Minuteman II and III missile programs are doing very well. In view of this fact, I wonder why the decision was

made to deploy a new sea-based strategic missile—the ULMS. Also the Polaris to Poseidon conversion program is under way.

I recognize the increased range of the missile will [deleted].

Admiral MOORER. I would add to what you stated, which is quite true, that you have a greater range. You can operate from U.S. ports. You can also be more selective about the trajectory so far as the Soviet defenses are concerned. Initially the ULMS–I missile will [deleted].

Chairman ELLENDER. I wanted to get your views to see if they coincided with what Secretary Laird has said.

Admiral MOORER. I think when I give my presentation this will come better into focus in the sense that we have not built any new missiles for a long time. We have 1,065 land-based missiles and 656 submarine missiles.

Chairman ELLENDER. But you have improved your missiles.

Admiral MOORER. Yes, sir.

Chairman ELLENDER. Minuteman I to II and III.

Admiral MOORER. That is right, and we improved from A–1, through A–2, to A–3 to Poseidon. You are right.

Secretary LAIRD. I just came in late. I apologize for that. I came from the Governors' conference. I heard part of the conversation and we have no disagreements.

Chairman ELLENDER. I was trying to have the record indicate that.

I have thought for many years that the Minuteman I, II, and III were an adequate deterrent. It was my belief that land-based missiles might not only be more accurate but they serve more as a deterrent than anything we have. For you to say now that we are not going to spend any more money to develop land-based missiles——

Admiral MOORER. We said we were not going to increase the number of land-based missiles. We are spending a large sum of money on the missiles we already have.

Chairman ELLENDER. That is on Minuteman III. But you will limit the quantity to the present figure. Instead of increasing that, you are going to commence a new ULMS program for which you spent a little money last year. You also want to advance the production schedule of the ULMS.

Admiral MOORER. That is right.

GREATER RELIANCE ON NATIONAL GUARD AND RESERVE FORCES VIS-A-VIS SELECTIVE SERVICE

Chairman ELLENDER. Mr. Secretary, you may now continue from page 15 where we left off. I understand that Senator Allott had two or three questions.

Senator ALLOTT. This is not an appropriate time.

Chairman ELLENDER. You may proceed.

Secretary LAIRD. Last year I reported on the first actions being taken to place greater reliance on our National Guard and Reserve, and to preclude any need to return to a massive draft. We mean to have National Guard and Reserves that are manned, equipped, and trained to mesh, on quick notice, with our Active Forces.

I am well aware, and this is certainly true also for Members of Congress, that for many years we have talked about achieving a true combat ready status for our National Guard and Reserve. Considerable

progress has been made, but by no means enough. Our utilization of the Air National Guard and the air units in the various Reserve Forces is much improved.

Senator YOUNG. Could I interrupt? If we have a policy of not calling up Reserves in another war this would not help us; would it?

POLICY STATEMENT

Secretary LAIRD. We have changed this policy, and I would like to put in the record the policy directive to them that applies now because we are going to rely on Guard and Reserve and not selective service. If I could put that policy statement in the record at this point I think it would be helpful, Mr. Chairman.

Senator YOUNG. I think so, too.

Chairman ELLENDER. Do you want to put that in now?

Secretary LAIRD. That would be fine.

(The statement follows:)

THE SECRETARY OF DEFENSE,
Washington, D.C., August 21, 1970.

Memorandum for: Secretaries of the Military Departments; Chairman, Joints Chiefs of Staff; Director, Defense Research and Engineering; Assistant Secretaries of Defense; and Department of Defense Agencies.

Subject: Support for Guard and Reserve Forces.

The President has requested reduced expenditures during Fiscal Year 1971 and extension of these economies into future budgets. Within the Department of Defense, these economies will require reductions in overall strengths and capabilities of the active forces, and increased reliance on the combat and combat support units of the Guard and Reserves. I am concerned with the readiness of Guard and Reserve units to respond to contingency requirements, and with the lack of resources that have been made available to Guard and Reserve commanders to improve Guard and Reserve readiness.

Public Law 90-168, an outgrowth of similar Congressional concern, places responsibility with the respective Secretaries of the Military Departments for recruiting, organizing, equipping and training of Guard and Reserve Forces. I desire that the Secretaries of the Military Departments provide, in the FY 1972 and future budgets, the necessary resources to permit the appropriate balance in the development of Active, Guard and Reserve Forces.

Emphasis will be given to concurrent consideration of the total forces, active and reserve, to determine the most advantageous mix to support national strategy and meet the threat. A total force concept will be applied in all aspects of planning, programing, manning, equipping and employing Guard and Reserve Forces. Application of the concept will be geared to recognition that in many instances the lower peacetime sustaining costs of reserve force units, compared to similar active units, can result in a larger total force for a given budget or the same size force for a lesser budget. In addition, attention will be given to the fact that Guard and Reserve Forces can perform peacetime missions as a by-product or adjunct of training with significant manpower and monetary savings.

Toward this end, the Assistant Secretary of Defense (Manpower and Reserve Affairs) is responsible for coordinating and monitoring actions to achieve the following objectives:

Increase the readiness, reliability and timely responsiveness of the combat and combat support units of the Guard and Reserve and individuals of the Reserve.

Support and maintain minimum average trained strengths of the Selected Reserve as mandated by Congress.

Provide and maintain combat standard equipment for Guard and Reserve units in the necessary quantities; and provide the necessary controls to identify resources committed for Guard and Reserve logistic support through the planning, programing, budgeting, procurement and distribution cycle.

Implement the approved ten-year construction programs for the Guard and Reserves, subject to their accommodation within the currently approved TOA,

with priority to facilities that will provide the greatest improvement in readiness levels.

Provide adequate support of individual and unit reserve training programs.

Provide manning levels for technicians and training and administration reserve support personnel (TARS) equal to full authorization levels.

Program adequate resources and establish necessary priorities to achieve readiness levels required by appropriate guidance documents as rapidly as possible.

MELVIN R. LAIRD.

PRIOR COMPONENT INACTIVITY

Chairman ELLENDER. This committee called that to your attention year before last.

Secretary LAIRD. In the past there was very little done with the Reserve and the Guard except for domestic uses, although they used the Air Force for some missions. We thought that the expenditure of around $3 billion to keep all this up was a lot of money for not using it. I am glad that that is changed. You will be pleased with this policy which we have.

We have, for example, assigned Air National Guard units to stand strip alert for the Air Defense Command; Army National Guard units man air defense facilities such as the Nike-Hercules battalions in many of our States.

But we have only scratched the surface in utilizing the National Guard and Reserve forces in our strategy planning. We have had, over the past decade, too much talk and too little action in making these units combat ready. And the fact is that the effectiveness of many National Guard and Reserve units was eroded by requisitioning too much key equipment during the years when the war in Vietnam was at its peak. Also, many of these units were forced, because of disturbances here at home, to devote a considerable part of their training and resources to the assistance of State and local law enforcement authorities.

EQUIPMENT AVAILABILITY AND COMBAT-READINESS TRAINING

Vietnamization has made it possible for us to provide millions of dollars worth of equipment to our National Guard and Reserve. As unrest at home has diminished, it has become possible for our citizen soldiers to devote increasing attention to combat readiness training. These changes have, until now, gone relatively unnoticed. But in the months and years immediately ahead it will become evident that, under our total force concept, the National Guard and Reserve are taking on ever-increasing combat readiness responsibilities. I believe this is exactly what the commanders and members of these units want.

We are now examining the possibility of having naval reservists take primary responsibility for manning an aircraft carrier.

There is no excuse for us to waste the talents of many National Guard and Reserve air squadrons, many of whose pilots and technicians are combat experienced and who want to do something more than to simply participate in training exercises not directly related to specific naitonal security missions under the new strategy.

FUNDING INCREASE

That is why the budget which President Nixon sent to Congress calls for a $600 million increase for National Guard and Reserve forces. Our planning for the coming year envisages that the National

Guard and Reserve forces will receive more equipment than in any single year in our history. Much of this equipment includes such items as fixed-wing aircraft and helicopters from Vietnam.

Just as we cannot—with smaller U.S. forces—have adequate free world security without a strengthened and revitalized security assistance program to help our allies build up their own capabilities, neither can we have adequate U.S. forces that are 1,200,000 below 1968 active duty peaks unless we put comparable emphasis on strengthening, training, and equipping a fully manned National Guard and Reserve under the total force concept.

BURDEN SHARING: DECEMBER 1971 MEETING PROPOSAL FOR STANDING NATO NAVAL FORCE IN MEDITERRANEAN

Total force involves much more than the National Guard and Reserves. For example, we are working on plans in which superiority at sea will continue to be assured in the future through burden sharing and total force.

As part of the partnership emphasis of the Nixon doctrine, the responsibility for superiority at sea must be shared more fully by our friends and allies. That is why I proposed, among other reasons, at the NATO meeting in December 1971, creation of a standing NATO naval force in the Mediterranean to complement the NATO naval standing force operating in the Atlantic.

Chairman ELLENDER. What response did you get from the allies in respect to strengthening that naval force?

Secretary LAIRD. This was a new proposal in December. The Germans have already indicated a willingness to cooperate. They have indicated a willingness to assign some ships for exercises in the Mediterranean area. For the first time, we are getting a very good response for a new idea—from Italy, from the Greeks, from the other nations in the Mediterranean area—but it is going to take a little time to implement it.

U.S. SHIP REDUCTION AND CAPABILITY INCREASE IN MEDITERRANEAN AND ATLANTIC

Chairman ELLENDER. Does this mean we are going to be able to reduce our own forces in the Mediterranean?

Secretary LAIRD. We are reducing our own forces in the Mediterranean. We have had to reduce those forces as we have gone forward with our modernization program. We have a greater capability in the new ships that are being deployed to the Mediterranean, but we have reduced the number of ships assigned to the Atlantic and to the Mediterranean force because we have taken out some of the older World War II ships.

Chairman ELLENDER. It was not done because of assistance from our allies?

Secretary LAIRD. No; but if we are going to be able to maintain an adequate force level, we are going to have to have assistance of our allies in that area.

Russian Activity in Mediterranean

The Soviet Union has gone forward with a tremendous increase in ship operating days in the Mediterranean. Back in 1965 and 1966 the Soviet Union was steaming about 4,000 days in the Mediterranean. This last year they steamed, in the Mediterranean alone, close to 20,000 days.

Chairman Ellender. We have done that for 24 years.

Secretary Laird. But while our steaming days have gone down since 1969, theirs have increased.

Air Force and Army Roles in Deterrent Posture at Sea

Here, at home, I foresee a new order of total force application with regard to protection of sea lanes and sea surveillance. We are at work on plans in which the Air Force would share with the Navy some of the responsibility for our deterrent posture at sea. If, for example, B–52's can be employed with great effectiveness in a tactical ground support role in Vietnam—a task for which this aircraft was not originally intended—then there is no reason why the Air Force cannot be assigned some major responsibilities for control of the seas.

And it is possible that in the future, some Army Air Defense expertise, such as that related to countering the threat of low-level air attacks, could contribute to improved ship survivability at sea.

Maximum and Integrated Use of All Resources

The total force concept means nothing less than maximum and integrated use of all our available resources—including those of our allies and friends. We must shed old parochial concepts of national security planning to meet global defense requirements for the future. Some of the decisions we will be making in the immediate years ahead will reach their optimum application in the 21st century. At this point, I would like to include in the record the chapter of my report that gives a detailed discussion of our efforts to implement the total force concept and the new strategy.

(The excerpt follows:)

III. TOTAL FORCE PLANNING TO IMPLEMENT THE STRATEGY

A. THE FY 1973 BUDGET AND THE FIVE-YEAR PROGRAM

I presented to you last year the first Five-Year Defense Program of this Administration, indicating that we had essentially completed the transition from the expanded force levels needed to fight the Vietnam conflict to our baseline force for future planning. In the program I am presenting to you today, we are maintaining the baseline while designing the Nixon Doctrine forces needed to implement our strategy. The proposed peacetime force structure is, in my judgment, adequate to fulfill the basic planning requirements which I will discuss presently. However, this judgment is conditioned on effective implementation of the Total Force Concept -- both with regard to increasing the capability of our own Reserve and Guard Forces, and with respect to our allies' willingness to continue improving their active and reserve forces. Table 2 at the end of this Report provides a summary of the forces we now plan to maintain over the FY 1973-1977 period.

In the following sections, I will discuss many of the specific programs we are recommending in the FY 1973 Budget to preserve baseline capabilities; to provide for readiness, modernization and improvement in needed baseline capabilities; and to create additional options for new forces should future events require them.

Before turning to the specifics of our programs, I would like to discuss briefly the major trends in the FY 1973 Defense Budget. The FY 1973 budget I am presenting today is designed to provide a balanced program across the spectrum of capabilities required to implement our National Security Strategy of Realistic Deterrence.

1. Financial Highlights

Budget authority requested for FY 1973 totals $83.4 billion. This is an increase of $6.3 billion over FY 1972, and represents 29.8% of the total Federal Budget, the lowest level in 23 years. It should be noted that a large part, a total of $4.1 billion or 65% of the $6.3 billion increase represents increases in the cost of military, civilian and retired pay.

Defense outlays for FY 1973 are estimated at $76.5 billion, up by $700 million from FY 1972. Here again, the increase is much less than that for other federal programs. Defense outlays represent 30% of the federal budget in FY 1973, the lowest level since FY 1950. The percentage of the GNP devoted to Defense continues to decline -- from 7.0% in FY 1972 to 6.4% in FY 1973. This is a 22 year low.

We also are requesting a supplemental appropriation for FY 1972 totaling $141 million in RDT&E and $113.8 million in procurement funds. Only essential programs that in our judgment could not await the availability of FY 1973 funds have been included in this important request. We have proposed in our supplemental request additional funding to accelerate important programs within amounts that have already been authorized for appropriations during FY 1972.

2. Major Program Highlights

The FY 1973 Budget provides significant increases in the following areas:

-- Budget authority for strategic nuclear forces will increase by $1.2 billion, including a major step to strengthen the sea-based element (ULMS) of our deterrent and to procure a new Advanced Airborne Command Post (AABNCP). A major part of the supplemental proposed for FY 1972 is to be applied to these two programs. We are also continuing development of the B-1 strategic bomber to provide an option to improve that element of our deterrent forces for the 1980's and beyond.

-- Budget authority for research and development will increase by $1.0 billion, to provide the increased effort needed to maintain our technological superiority. The remainder of the FY 1972 supplemental will also be applied to R&D.

-- Budget authority for shipbuilding and conversion will increase by over $500 million to a level more than two times the 1966-1970 average, demonstrating our emphasis on modernizing and maintaining a strong Navy.

-- Budget authority for Guard and Reserve Forces will increase by over $600 million, reflecting their increased role under the Total Force Concept and the need to prepare them to augment the active forces in any future contingency.

-- Training, medical and general personnel programs will increase by $1.8 billion in FY 1973. This indicates the emphasis placed on personnel-oriented program as we move toward a zero draft and an All-Volunteer Force, as well as the increased costs of military retired pay and medical care and other support for active and retired military personnel.

-- Support to other nations increases $300 million, reflecting a larger increase for Military Assistance, offset by reduced requirements for support of Vietnamese and other Free World forces.

As for specific programs, in the strategic forces area major increases are proposed for the B-1, the sea-based missile force, Airborne Warning and Control System (AWACS), SAFEGUARD and the AABNCP. General purpose force funding increases are included for a fourth nuclear-powered aircraft carrier, the Air Force's new F-15 fighter, the Navy's new Patrol Frigate, and nuclear attack submarines.

Total military and civilian defense manpower is expected to be 3,394,000 at the end of FY 1973, the lowest level since 1950. This total represents a decrease of 38,000 from FY 1972, and it is 1,440,000 below the Vietnam war peak of FY 1968. Military manpower is down 1,189,000 and civilian manpower 251,000 from 1968 peaks. Over this same period defense-related employment in industry will also register a decline of about 1.3 million.

The dollar outlays for manpower continue to increase. Pay and related costs have increased from 53% of the budget in FY 1972 to about 56% in FY 1973, compared with 52% in FY 1971 and only 43% in FY 1964. However, budget authority for manpower is roughly constant at 53% for both FY 1972 and FY 1973.

As we proceed towards an all-volunteer force and as we seek to make military service more attractive and more rewarding, we can expect upward pressures on manpower costs to continue. We will continue our efforts to bring them into a more realistic balance with our other critical needs. It will not be easy to strike a balance between our equipment needs and our manpower needs. I believe, however, that the FY 1973 Budget will provide the minimum funds needed for both manpower and equipment and will give us the force capability and readiness which are essential for the National Security Strategy of Realistic Deterrence.

B. MILITARY STRATEGY AND FORCE PLANNING

Our goal is to deter war. The military means to this deterrence goal require maintenance of military forces -- sufficient for deterrence and adequate in size and readiness, when combined with the forces of our allies -- to defend our vital interests in the event of conflict.

In defense planning, the resources available to meet the requirements of Free World security include both active and reserve components of U.S. forces, the forces of our allies, and the additional military

capabilities of our allies and friends that can be made available through provision of appropriate security assistance programs.

History has shown the disparity between plans for and use of military force. We cannot predict in specific detail how our military forces might be used in any given situation. We can, however, specify what we want them to be able to do, provide some inherent flexibility, and estimate what they can do in likely situations. We must be sure that our forces provide relevant power -- power to reduce the probability of conflict; power to fight, if necessary, in defense of our interests.

Our FY 1973 Budget plus certain programs contained in the FY 1972 Supplemental request reflect in particular our concern about the nuclear threat posed by the Soviet Union. The programs we are proposing are the minimum required, in my judgment, to provide forces and development programs necessary to maintain our strategic sufficiency.

While our planned five year strategic force program reflects tentative decisions about deployment of certain forces under development, it is designed for maximum flexibility in order to take account of developments either in the threat or at SALT.

Our theater and tactical nuclear capable forces also serve an essential role in the spectrum of deterrence. To be a realistic deterrent, these forces must possess a credible and effective theater nuclear capability, backed by U.S. strategic forces. While these forces are designed primarily to deter nuclear conflict, they also serve to help deter conventional aggression because of the uncertainty surrounding the circumstances under which theater nuclear weapons might be employed. Our planning calls for moderate improvements in our current capabilities in this area.

Our force planning objective for theater conventional warfare is to provide for adequate ground, air, naval and mobility forces -- active and reserve, allied and U.S. -- which in combination with our nuclear forces will deter such conflict. This requires an effective and visible U.S. and allied capability to cope with major USSR or PRC aggression against any country or area vital to our interests.

We recognize that subtheater/localized conflict cannot be controlled or prevented by the unilateral fiat of any major power, and that such conflicts can erupt periodically and, in some cases, unexpectedly.

Force planning for both theater and subtheater conventional conflict involves the most appropriate application of the Total Force Concept. We have therefore established the following guidelines:

-- Friendly countries should be encouraged to increase their regional and self-defense efforts, with due regard for maintenance of international economic stability.

-- Security assistance should help foster regional security arrangements, so that individual country defense burdens are kept within practicable limits and regional arms races are avoided.

-- Allied forces may be structured in a balanced fashion in anticipation of unilateral defense; or emphasis may be placed on developing forces -- particularly those for ground combat -- capable of operating effectively with U.S. support forces. Determination of which objective is most appropriate will depend on individual circumstances.

-- The forms of security assistance will be chosen in accordance with local requirements, cost and availability.

-- The U.S. general purpose force structure can be adjusted further when allied defense assets already on hand can perform the same function adequately. Similarly, future allied capabilities often will be able to substitute for U.S. forces. Where possible, we should support this local force development with appropriate security assistance.

-- Any redeployments of U.S. forces presently stationed in forward positions will be carried out consistent with maintenance of adequate Free World forces to support our interests and those of our allies.

Four general categories, consistent with the above guidelines, govern our planning under the Total Force Concept. They facilitate, where appropriate, an orderly progression from heavy reliance on U.S. forces to increasing reliance on indigenous forces. These categories are:

Combined force planning assumes integration of U.S. forces with local forces and calls for force plans to be developed in close consultation with allies. Examples include NATO, Korea and Vietnam through the completion of Phase I of Vietnamization last year. This planning reflects detailed consideration of all assets available to the various countries in fulfilling necessary requirements for deterrent forces in peacetime and effective combat forces should deterrence fail.

Complementary force planning assumes U.S. obligations of some military nature to help defend a particular country under attack but generally does not include prepositioned, integrated U.S. forces on the ground during peacetime. This planning also is developed in close consultation with friends and allies. Examples include Thailand, Japan, and Vietnam until Phase II of Vietnamization is completed. The primary consideration with regard to U.S. forces is the role these forces would play in the event of conflict in augmenting national forces in areas where local capability is low or marginal. Primary reliance should be placed on the use of local manpower and the development of self-sufficient local capabilities against large scale external aggression, with the U.S. providing specialized support and necessary assistance, designed to augment local forces.

Supplementary force planning reflects a U.S. role in supplementing local capabilities primarily through the provision of appropriate security assistance. This planning emphasizes making available the requisite training, equipment and supplies to improve the deterrent forces of our friends and allies. Examples include Indonesia, Cambodia and certain countries in the Middle East.

Unilateral U.S. force planning reflects U.S. requirements for responding to contingencies where U.S. interests or obligations are at stake. This would involve only U.S. forces in situations where we would not expect active support from others.

As I noted earlier in my statement, an attempt to integrate more closely available Free World resources will require many changes in our past approaches -- changes which pose difficulties in both understanding and implementing effective programs.

While we are making substantial progress in our efforts to implement these total force planning guidelines, it will take time to complete the adjustment from the rigidities of the past to the realities of the future. These adjustments can and must continue to be made, both in our own force planning and in planning with our allies.

Let me now turn to a discussion of the details of the program which we are recommending to you for the forthcoming year, after which I will highlight some of the initiatives we are pursuing in our own force planning and in our relations with our allies.

C. STRATEGIC NUCLEAR FORCES FOR DETERRENCE

"Our forces must be maintained at a level sufficient to make it clear that even an all-out surprise attack on the United States by the USSR would not cripple our capability to retaliate. Our forces must also be capable of flexible application. A simple "assured destruction" doctrine does not meet our present requirements for a flexible range of strategic options. No President should be left with only one strategic course of action, particularly that of ordering the mass destruction of enemy civilians and facilities."

President's Foreign Policy Report
to Congress, 1972

1. Strategic Sufficiency and the Implications for Force Planning

In deterring strategic nuclear warfare, i.e., enemy use of nuclear weapons involving a direct attack on the U.S., primary reliance will continue to be placed on U.S. strategic deterrent forces.

In planning these forces, we have certain objectives derived from the sufficiency criteria. As explained last year these include:

-- Maintaining an adequate second-strike capability to deter an all-out surprise attack on our strategic forces.

-- Providing no incentive for the Soviet Union to strike the United States first in a crisis.

-- Preventing the Soviet Union from gaining the ability to cause considerably greater urban/industrial destruction than the United States could inflict on the Soviets in a nuclear war.

-- Defending against damage from small attacks or accidental launches.

I want to note, however, that these criteria are under intensive review in light of the changing strategic conditions, including the momentum of Soviet and Chinese nuclear capabilities, and potential outcomes in the Strategic Arms Limitation Talks (SALT).

As the President has stated, sufficiency includes maintaining forces adequate to prevent our allies, as well as the U.S., from

being coerced. Therefore, we also plan our strategic nuclear forces so that they will enhance our theater nuclear capabilities and the nuclear capabilities of our allies to deter attacks on them by strategic or other nuclear forces.

In order to maintain needed flexibility, we design our forces so that we have strategic alternatives available for use depending on the nature or level of provocation. This means capabilities that enable us to carry out an appropriate response without necessarily resorting to mass urban and industrial destruction.

Turning to specifics in our planning, although each element of our strategic offensive forces at the present time possesses a substantial capability in its own right, we plan to maintain a combination of land and sea-based missiles and manned bombers during the program period. This will enable us to take advantage of the unique capabilities inherent in these different systems, to provide a hedge against enemy technological breakthroughs or unforeseen operational failures, either of which might adversely affect our deterrent, and to complicate Soviet and PRC offensive and defensive strategic planning.

In our strategic defensive planning, we are designing our forces in accordance with the objectives already described, especially the deployment of defenses that limit damage from small attacks or accidental launches to a low level.

Our objectives for air defense of the United States include:

-- Deterring air attacks by defending strategic retaliatory forces, and key military and urban/industrial targets.

-- Defending the National Command Authority.

-- Limiting damage from deliberate or unauthorized small air attacks.

-- Restricting the unauthorized overflight of U.S. airspace.

Warning against ballistic missile attack on the U.S. will be based on maintaining a highly reliable warning network with adequate coverage. We seek to minimize the susceptibility of this network to any countermeasures. Furthermore, command and control systems should be secure, reliable, flexible, and survivable to insure that strategic forces are immediately responsive to political and military decisions.

In our research and development planning for strategic offensive forces, we are directing our efforts toward vigorous programs emphasizing innovation, flexibility, diversification, and survivability rather than, as some believe, the maintenance of a large independent retaliatory capability in each of the current force components. We are examining new concepts for future strategic offensive forces, keyed to an approach that diversifies U.S. programs if additional capabilities are needed in the future.

Our continuing analyses of strategic force effectiveness indicate that planned strategic forces should continue to provide an adequate deterrent for the near term. We have reliable and survivable strategic retaliatory forces today, and their capabilities for retaliation cannot be denied by nuclear attack in the near term.

2. The Planned FY 1973 Strategic Forces

No major changes in deployed U.S. strategic retaliatory forces will be evident in FY 1973, although we are continuing to make qualitative improvements in our forces. At the end of that fiscal year, our strategic offensive force levels will continue to include 1,000 MINUTEMAN missiles, 54 TITAN missiles, 455 B-52 aircraft (26 squadrons), 72 FB-111 aircraft (four squadrons), and 656 POLARIS and POSEIDON missiles carried in 41 nuclear submarines. In the strategic defensive forces, we will reduce to 585 manned interceptors and 755 surface-to-air missiles on site, together with associated warning and command and control systems.

With planned modernization, and with a phased SAFEGUARD deployment as appropriate, these strategic force strengths represent our baseline planning forces for the future.

3. Major Strategic Force Programs

The major programs for improvement and modernization discussed in the following sections are designed to provide capabilities to fulfill the basic planning objectives I noted earlier, while at the same time preserving flexibility to adjust capabilities in the future if necessary. A summary of the FY 1973 programs, and the FY 1971 and FY 1972 effort, is shown on the following page.

a. The Strategic Retaliatory Force

In the strategic offensive forces area, we continue to move forward with planned improvements to all elements of our deterrent in light of the continuing momentum of the Soviet threat.

Selected Strategic Forces Programs

	(Dollars in Millions) FY 1971 Actual Funding	FY 1972 Planned Funding	FY 1973 Proposed Funding
Reliable, Survivable Retaliatory Forces			
Development and Procurement of New Undersea Long Range Missile System (ULMS)	44	140	942
Continued Development of New Strategic Bomber, B-1	75	370	445
Development and Continued Procurement of Short Range Attack Missile (SRAM) and Modification of Aircraft	281	383	314
Continued Development of Subsonic Cruise Armed Decoy (SCAD)	-	10	49
Continued Procurement of MINUTEMAN III and MINUTEMAN Force Modernization (inc dev costs)	695	848	837
Conversion of SSBNs to POSEIDON Configuration, Continued Procurement of POSEIDON Missiles and Associated Effort	952	766	751
Development of Advanced Ballistic Re-entry Systems and Technology	100	104	104
Reconnaissance, Early Warning, and Air Defense			
Development and Deployment of Advanced Airborne Command Post (AABNCP)	1	120	141
Continued Development and Production of Airborne Warning and Control System (AWACS), and Over the Horizon Radar (OTH)	92	142	474
Continued Deployment of New Satellite Strategic Surveillance System and Development of Follow-on Systems	105	86	80
Ballistic Missile Defense			
Continued Deployment of SAFEGUARD	1,369	1,117	1,483
Identification and Development of Advanced Ballistic Missile Defense Technology by the Army's Ballistic Missile Defense Agency	104	96	102
Prototype Development of Hard-Site Defense	25	60	80
Civil Defense O&M	73	78	88

Last year I reported to you that we had made some hard decisions with regard to development of certain strategic force programs, and that we would continue to keep this area under close review. In light of continued developments in the threat, we have decided this year to accelerate development of the Undersea Long-Range Missile System (ULMS), as well as moving forward with development of the B-1 bomber.

Undersea Long-Range Missile Systems (ULMS)

The continuing Soviet strategic offensive force buildup, with its long term implications, convinced us that we need to undertake a major new strategic initiative. This step must signal to the Soviets and our allies that we have the will and the resources to maintain sufficient strategic forces in the face of a growing Soviet threat. It would be diplomatically and politically unacceptable for the U.S. to allow the Soviets to achieve a large numerical superiority in both land-based and sea-based strategic missiles. Moreover, there would be an increasing military risk that future technological advances in conjunction with much larger numbers of Soviet strategic missiles, might offset the qualitative improvements we are planning for our land-based strategic forces.

I have carefully reviewed all alternatives for new strategic initiatives and have decided that acceleration of the ULMS program is the most appropriate alternative, since the at sea portion of our sea-based strategic forces has the best long term prospect for high pre-launch survivability. The Navy assures me that this acceleration will permit deployment of the first ULMS submarine in 1978, at least 2-3 years earlier than would have been the case in the regular program.

In reaching this decision, we considered a range of alternatives, including further modification to existing submarines and construction of additional submarines using the basic design for the latest POSEIDON submarines. We concluded that acceleration of the ULMS development program was the best possible course of action available for several reasons including:

First: The ULMS program is already underway as a major development program. It therefore does not involve disruption of ongoing programs which already have high priority, such as the POSEIDON conversions and construction of nuclear attack submarines.

Second: ULMS offers the best technical program currently available to provide future sea-based strategic force capability. It makes the greatest use of new submarine quieting technology, and is capable of carrying a larger ballistic missile than can be fitted

in existing submarines. The option to deploy this larger missile provides flexibility for increased range, and hence larger operating area at sea, or alternatively a capability to carry large, more advanced penetration payloads at less range, should this be desirable in the future.

Third: Deployment of ULMS, with a capability to carry a greater number of large missiles, means that a given nuclear payload can be deployed with fewer boats and crews.

Finally: The ULMS missile development program will permit an option to retrofit the shorter range ULMS I missile into POSEIDON submarines in the future, should that be desirable.

A total of $942 million is being requested for the ULMS program in FY 1973.

The ULMS program we are proposing will be discussed in further detail by other witnesses before the Congress. I am confident Congress will understand the need for accelerating the ULMS program, and will continue to provide this program the excellent support which it has received in the past.

The B-1 Strategic Bomber

The FY 1973 Budget includes $445 million to continue engineering development of the B-1 intercontinental bomber, intended to replace the aging B-52 fleet. The B-1 is being designed to improve capabilities over the B-52 through faster reaction, increased resistance to nuclear effects, shorter escape times, longer range, greater payload, higher speeds at both high and low altitudes, reduced infrared signatures, decreased radar cross sections, and greatly increased ECM capabilities. In total, these increased capabilities would enhance pre-launch survivability and penetration capabilities of the manned bomber force for the post 1980 time period.

The B-1 is being developed in such a manner as to minimize concurrency between development and production. In this respect, there will be about one year of flight testing on the prototypes before a production decision is necessary. This approach would permit us to have the B-1 operational in meaningful numbers by the early 1980's.

As Secretary Seamans indicated during his recent appearance before the Congress, the B-1 engineering development contract with North American Rockwell is a "Cost Plus Incentive Fee" contract with

no provision for a buy option. I want to emphasize that we will not commit the B-1 to production before performance requirements are demonstrated. The program provides for seven basic milestones, and was changed significantly last year when two test aircraft were eliminated and other adjustments made in the development program. The first flight is scheduled for April 1974.

Other Programs

As I noted last year, to enhance the prelaunch survivability of our current strategic bomber force against the Soviet submarine-launched ballistic missile threat, alert aircraft are being dispersed over a greater number of bases, generally further inland than in the past. Nineteen satellite bases, each with austere facilities to support aircraft, will be in operation by the end of FY 1973. We are continuing to examine options for more extensive interior basing of this force, and other means to further improve prelaunch survivability against a broad range of potential threats -- the one of most concern being a postulated improvement to submarine-launched ballistic missiles, which would decrease the warning time available to the bomber force.

To improve the capability of the B-52 and FB-111 bomber force to penetrate improved defenses postulated for the latter half of this decade, we are requesting $314 million in FY 1973 to: (1) procure Short Range Attack Missiles (SRAM); and (2) modify 92 B-52 aircraft to carry SRAMs. In addition, we are requesting $49 million to continue development of the Subsonic Cruise Armed Decoy (SCAD) to counter projected improvements in Soviet area air defenses for the late 1970s. Both SRAM and SCAD will be compatible with the B-1.

SCAD, which is expected to have a range of several hundred miles, will simulate the radar characteristics of a bomber, thereby presenting many additional incoming objects that the Soviets must counter with area defenses. The SCAD is also being designed to accept, with minimum modifications, incorporation of a warhead with associated improved guidance and increased range. We presently plan to produce prototypes of key SCAD subsystems -- engines and avionics -- prior to making a decision to produce the system.

The SRAM carries a nuclear warhead and travels at supersonic speed. It gives the attacking plane a capability to "stand off" from a target and avoid terminal anti-aircraft defenses, or the capability to suppress the defenses and penetrate to the target. After a favorable test program, the Air Force entered into full production

of the missile last year.

We are continuing the program to deploy MIRVs in our MINUTEMAN and POSEIDON missiles. We consider this program essential to preserve the credibility of U.S. deterrent forces when faced with the growing Soviet strategic threat. The MIRV program provides a number of small, independently-targetable warheads on a single missile. Should part of our missile force be unexpectedly and severely degraded by Soviet pre-emptive actions, the increased number of warheads provided by the remaining MIRV missiles will insure that we have enough warheads to attack essential soft urban/industrial targets in the Soviet Union. At the same time, the MIRV program gives us increased confidence in our ability to penetrate Soviet ABM defenses, even if part of our missile force were destroyed.

Including MIRV, several major programs for the improvement and modernization of our land-based missile force are now underway, with a total funding requested of $837 million. The budget includes $415 million to procure a quantity of MINUTEMAN IIIs, toward a planning objective of 550 missiles. The force modernization program includes upgrading MINUTEMAN silos in order to reduce their vulnerabilit to nuclear blast and radiation effects. This upgrading program is coordinated with the replacement of MINUTEMAN I by MINUTEMAN III missiles to complete both the silo upgrading and MINUTEMAN III deployment programs efficiently.

In addition, our SAFEGUARD deployments will provide active defense of a part of our ICBM forces, and we are continuing prototype development of Hardsite Defense (HSD) to provide an option to protect our land based ballistic missiles against threats greater than those with which SAFEGUARD is designed to cope. I will discuss these programs and their relation to our overall planning in a later section.

We are continuing to convert POLARIS submarines to carry the POSEIDON MIRV missile. The POSEIDON development test program was completed in June 1970. Through February 1972, there have been 24 missiles fired from operational submarines. The Budget includes $751 million to convert more submarines, procure more missiles and provide long lead items for conversions planned next year. Funding for the POSEIDON submarine conversion program should be completed in FY 1974, with the exception of outfitting and postdelivery costs.

One other important developmental effort that we are continuing in the strategic offensive area is the Advanced Ballistic Re-entry

Systems (ABRES) program. We plan to continue our investigations of several types of re-entry systems, and are requesting $104 million in FY 1973 for this effort. Dr. Foster will discuss the details of this program with you.

b. Strategic Command and Control

As I explained earlier in this chapter we seek reliable, flexible and survivable command and control systems. The growing threat from Soviet strategic forces makes early improvements to our national command and control system imperative. The most critical need is for a survivable, enduring command post. Over the years, we have concluded that the best solution to this problem for the foreseeable future is to go airborne with adequate command, control and communications facilities on board. Accordingly, we have decided to move ahead and request funds for procurement of new aircraft for this purpose.

Our current airborne command and control system is deficient in that it lacks capacity for added communications and data processing equipment. We need to improve the survivability of the system, and to provide the more secure communications needed for control and execution of the forces, the long endurance, the space for sufficient high level staff to support the National Command Authorities, and the space for the battle staff and equipments which provide the information needed in the critical decision-making process.

Earliest possible correction of deficiencies is essential. We believe that by moving vigorously now we can greatly improve our command and control posture by early 1975. To achieve this goal, the first steps are to acquire aircraft with the size and endurance needed and to initiate acquisition of the new on-board facilities.

To perform the command and control job, a fleet of seven AABNCP aircraft is needed. We requested $119.8 million in our FY 1972 Supplemental request to purchase the first Boeing 747 aircraft and related electronics. We propose to purchase two more aircraft in FY 1973 and one additional aircraft in 1974 to achieve early correction of our deficiencies. The initial aircraft will provide some important improvements in our capability by 1973. Three of these first four aircraft will use the existing EC-135 electronic equipment and the fourth will be used for a special electromagnetic pulse test program and as a test bed for the development and operational testing of those new equipments which will be needed. By providing a larger, more capable aircraft, even with the present electronic equipment, we will be able to obtain greater endurance, more flexibility, capacity for larger battle staffs, and additional space to put improved communications and automatic data processing as it becomes available.

To provide a much needed improvement in Naval and Air Force communications, and to strengthen the survivability and flexibility of our control and communications to the strategic bomber forces as well as the SLBM forces, we have initiated in FY 1973 a new communications satellite program for air and sea-mobile users-FLEETSATCOM.

c. Strategic Defensive Forces

1. Air Defense

At the end of FY 1972 the air defense forces will include a total of 27 squadrons of interceptors and a number of NIKE HERCULES and BOMARC surface-to-air missile units. In FY 1973, no changes are planned in the total number of interceptor squadrons, but in keeping with our Total Force Concept, Air National Guard Air Defense forces are programmed to assume a greater share of the aerospace defense mission. At the end of FY 1973 they should include 4 squadrons of F-106s, 10 of F-102s, and 6 of F-101s. The other main force changes planned are reductions in BOMARC surface-to-air missiles, which back up our manned interceptor force, and the Back-up Interceptor Control (BUIC) sites, which provide backup air defense command and control.

Our air defense systems have not in the past been able to meet all of the objectives assigned to them. Command and control systems have been vulnerable, warning systems have been unable to detect all incoming aircraft using low-level penetration tactics, and our interceptors are too few in number and lack the "look-down shoot-down" capability required against low-flying bombers.

Because of this vulnerability and the reduced effectiveness of parts of our present air defense forces, we have decided to make some selected reductions in the current force levels, accepting some additional risks in the near term while pursuing development of more effective air defense components for the future.

To fulfill our air defense objectives we propose to continue research and development efforts that will give us the option to deploy an effective, survivable, modernized air defense force. Our FY 1973 Budget includes research and development funds for two key systems: the CONUS Over-the-Horizon radar (OTH-B), and the Airborne Warning and Control System (AWACS). We are also requesting funds to procure three AWACS test aircraft that could later be reconfigured as operational aircraft.

The CONUS OTH-B radar system is important because it offers the potential to provide distant, all-altitude detection of approaching aircraft. Tests now being conducted should soon provide performance data essential to a deployment decision.

AWACS will provide the capability to detect and track aircraft flying at all altitudes, against the surface clutter over land or sea. Two prototype radars are being prepared for flight testing in military versions of the Boeing 707 commercial jet aircraft and the tests should be completed in late 1972. We can then select the better radar system, and decide in light of circumstances at that time whether to proceed with the final stages of system development.

AWACS will also have the capability to serve as an aircraft control center for tactical air forces. In this role AWACS would improve the effectiveness of our tactical air forces by providing an aerial platform for the detection and identification of hostile aircraft and the direction and control of friendly aircraft assigned to counter those threats. The tactical AWACS would replace several airborne elements of the existing system used in the command and control of deployed tactical air forces.

We are examining the feasibility of using aircraft now under development as the basic airframe for an Improved Manned Interceptor (IMI); which would complement AWACS by providing "look-down shoot-down" capability with high endurance and good firepower. In addition, the Army surface-to-air missile system (SAM-D), currently under development primarily for field army use, may prove useful in a CONUS air defense role in the future as a replacement for the NIKE-HERCULES system.

2. Missile Warning and Space Systems

Early warning of ICBM attack will continue to be provided by the Ballistic Missile Early Warning System (BMEWS) radars and the "forward scatter" Over-the-Horizon (OTH) radar system. At the present time, the 474N system (SLBM detection and radar warning net) which can give only limited warning of an SLBM attack, has been improved with the addition of a long-range radar along the east coast in FY 1972. However, because of the restricted capabilities in these systems, a new satellite early warning system is being designed to meet requirements that BMEWS, OTH and 474N cannot fill. This advanced system will complement our radars in providing early warning of ICBM, SLBM and Fractional Orbital Bombardment System (FOBS) launches. The system will greatly improve the overall capability of our warning network, especially against SLBM launches.

Satellite tracking and identification is now provided by the existing USAF Spacetrack system and the Navy's SPASUR system; both are tied into the North American Air Defense Command and supported by the Space Defense Center for continuous space object cataloguing.

3. Ballistic Missile Defense

a. SAFEGUARD

The SAFEGUARD Anti-Ballistic Missile Defense System has been and continues to be designed to achieve several objectives outlined by the President to counter a combination of Soviet and Chinese threats. They include:

-- "Protection of our land-based retaliatory forces against a direct attack by the Soviet Union.

-- "Defense of the American people against the kind of nuclear attack which the Peoples Republic of China is likely to be able to mount within the decade.

-- "Protection against the possibility of accidental attacks from any source."

A review was conducted again this year in accordance with the President's commitment of March 14, 1969. This review of SAFEGUARD includes:

Technical Progress

-- The technical effort on SAFEGUARD over the past year has progressed very satisfactorily and there are no technical problems which would affect a decision to continue the SAFEGUARD deployment in FY 1973.

-- Test results have been excellent. The second phase of the SAFEGUARD system test program began in the Fall of 1971. Of the seven tests conducted so far in this series, all have been successful.

-- Construction at the Grand Forks site is on schedule and about 80% complete. Construction at Malmstrom has been delayed by about one year by labor problems with corresponding delay in site readiness to early 1976. Construction at Malmstrom has been restarted.

-- All of the SAFEGUARD ground equipment for Grand Forks and Malmstrom is under contract and procurement of equipment has been initiated for the Whiteman site.

Threat

-- The momentum of the Soviet nuclear threat continues and the nuclear capability of the Peoples Republic of China is increasing. (This is detailed elsewhere in this Defense Report.)

Diplomatic Context

-- Negotiations on Strategic Arms Limitation (SALT) continue. Current focus in SALT is towards obtaining an initial agreement covering ABM systems together with some limitation on offensive missile systems. However, we cannot at this time be certain that a SALT agreement will be reached or what the provisions of an agreement would be.

For FY 1973, we propose to:

a. Proceed with the planned deployment at the four MINUTEMAN sites.

b. Continue with area defense research and development under SAFEGUARD and the Advanced BMD program.

c. Initiate advanced preparations for defense of the NCA at Washington, D. C.

d. Continue with the Hardsite Prototype development program discussed below.

This overall ABM program would:

-- Enhance probabilities for SALT success by maintaining both the flexibility and the strength of the President's negotiating position.

-- Provide a level of protection, dependent upon the nature and severity of the attack, for MINUTEMAN, and command and control centers in the central United States (Omaha and Colorado Springs) at the earliest possible time, and a base for defense of inland bomber bases with improved area defense components.

-- Provide the means of affording added valuable time for decision-making and delegation of authority in the event of an attack on Washington, D.C.

-- Provide a continued option for introduction of advanced area defense at a later time, should this become necessary due to threat developments.

-- Provide the base for augmenting SAFEGUARD defense of MINUTEMAN sites with Hardsite Defense if threat developments warrant.

b. Prototype Hardsite Defense Program

With significant qualitative improvements in Soviet ICBMs even without increases in the number of Soviet ICBMs, the postulated threat to MINUTEMAN in the last half of the 1970s could grow to a level beyond the capabilities of the four site SAFEGUARD defense of MINUTEMAN. Therefore, we propose a FY 1973 Hardsite program funded at $80 million in RDT&E funds plus $20 million in construction that would permit initial deployment of the system in the late 1970s.

4. Civil Defense

We are proposing a limited number of changes in the civil defense program for FY 1973, including:

-- enhancement of state and local capability in attacks and other disasters;

-- reorientation of the program to emphasize, wherever possible, available protection from nuclear weapon effects and natural disasters.

-- shifting of some on-going programs to systems that would only be implemented in a crisis in order to reduce peace-time costs and prevent rapid obsolescence.

Major elements of the new program include (a) maintenance of the current shelter system, but reorienting marking, stocking and home survey programs toward crisis implemented activities; (b) for shelter survey, creation of State Engineer Support Groups to give participating states the in-house capability to replace Federal Engineering Support currently provided; (c) use of analytical techniques to determine the most likely hazards for each community in the event of nuclear war, e.g., blast, fire, fallout; and (d)

development of guidance for local governments based on risk analysis, to include evacuation planning guidance for high risk areas.

During 1972 a prototype low frequency warning system will undergo final testing. It is expected to be operational by early 1973.

The budget includes $88.1 million for Civil Defense. As in the past, a sizeable portion of the funds requested are for assisting State and local Civil Defense activities.

D. THEATER NUCLEAR FORCES FOR DETERRENCE

> "the nuclear capability of our strategic and theater nuclear forces serves as a deterrent to full-scale Soviet attack on NATO Europe or Chinese attack on our Asian allies."
>
> President's Foreign Policy Report to Congress 1970 and 1971

In deterring theater nuclear warfare, i.e., enemy use of nuclear weapons overseas without a direct attack on the U.S., primary responsibility remains with the United States, but certain of our allies share in this responsibility by virtue of their own nuclear capabilities.

As I noted last year, with the rough equality of U.S. and Soviet strategic force capabilities, reliance on strategic weapons alone is not sufficient for an effective deterrent. Our theater nuclear forces add to the deterrence of theater conventional wars in Europe and Asia; potential opponents cannot be sure that major conventional aggression would not be met with the use of nuclear weapons. The threat of escalation to strategic nuclear war remains a part of successful deterrence at this level.

Our planning reflects a continued requirement to relate our nuclear weapon posture in the theater to our conventional posture in such a way that we have realistic options in the theater which do not require sole reliance on strategic nuclear weapons. Thus, we plan to maintain nuclear capabilities that contribute to realistic deterrence, while allowing for maximum flexibility of response in every major contingency we plan for should deterrence fail.

We are continuing to evaluate the long-term structure of our nuclear programs. Our current capabilities in theater assets, include tactical aircraft, missiles, rockets, field artillery, and atomic demolition munitions. Research and development and

weapon improvement programs are moving forward in this area, to insure that our weapons and the associated command and control systems have adequate capability and continue to emphasize minimum chance of accident. These programs will permit the continued sufficiency of our theater nuclear forces as an essential element of our deterrent posture.

E. CONVENTIONAL FORCES FOR DETERRENCE

> "To serve as a realistic deterrent, our general purpose forces, together with those of our allies, must be such as to convince potential enemies that they have nothing to gain by launching conventional attacks.
>
> "To deter conventional aggression, we and our allies together must be capable of posing unacceptable risks to potential enemies. We must not be in a position of being able to employ only strategic weapons to meet challenges to our interests. On the other hand, having a full range of options does not mean that we will necessarily limit our response to the level or intensity chosen by an enemy. Potential enemies must know that we will respond to whatever degree is required to protect our interests. They must also know that they will only worsen their situation by escalating the level of violence.
>
> "It is our policy that future guerrilla and subversive threats should be dealt with primarily by the indigenous forces of our allies. Consistent with the Nixon Doctrine, we can and will provide economic and military assistance to supplement local efforts where our interests are involved.
>
> "Our forces will be developed and deployed to the extent possible on the basis of a common strategy with our allies and a common sharing of the defense burden."
>
> President's Foreign Policy Report, 1971

In deterring theater conventional warfare -- i.e., a major non-nuclear war involving the USSR or PRC such as a major conventional war in Europe -- U.S. and allied forces share the responsibility.

Under our Total Force Concept for Force Planning, U.S. general purpose forces include assets applicable to theater nuclear, theater conventional and sub-theater roles.

These forces include the full range of air, sea, and ground forces needed to meet our planning goals. The programs that we are recommending this year maintain this full range of capabilities.

National Guard and Reserve forces have a key role to play under the Total Force Concept in implementing the strategy. Reserve components will be the initial and primary source of augmentation of the active forces during a contingency. This increased reliance on the Reserves requires much higher readiness than they have had in the past, however, and we are continuing to emphasize the three key elements of combat readiness--equipping, manning, and training. Progress in the manning and training of the Reserves will be discussed in Section Two of this Report, Manpower Objectives.

There are three areas of significant progress in the equipping of Selected Reserve units to perform their mobilization missions. One takes the form of resource identification -- the establishment of formal procedures for observing and controlling equipment flow from the allocation of procurement funds to the receipt of hardware by the units. Another is the provision of equipment to fill requirements and the modernization of equipment on hand. The third is the provision of sufficient full time personnel to manage and maintain the greater quantities of modern equipment and to train other unit members in its use.

In the remainder of this section, I will discuss many of the modernization programs related to our active conventional forces, together with improvements in the equipping of the Reserve and National Guard forces.

Shown on the table on the following page are the major modernization and procurement programs that we are proposing in FY 1973 for the general purpose and mobility forces.

1. Ground Combat Forces

Our capability to respond directly to any conventional land conflict with a high degree of control rests primarily on our Ground Forces, both active and reserve. Their visible combat capability and their deployment in areas where we have important security interests contributes substantially to an effective deterrent posture.

The Army and Marine Forces are sized and structured to be able to respond in concert with our allies to a wide spectrum of

Selected General Purpose and Mobility Forces
Modernization and Improvement Programs

	(Dollars in Millions) FY 1971 Actual Funding	FY 1972 Planned Funding	FY 1973 Proposed Funding
Ground Combat Capabilities			
Final Development/Termination Costs for Main Battle Tank (XM-803)	79	20	--
New Tank Development	--	20	20
Continued Production/Retrofit, M60A2 Tank	12	40	105
Continued Modification and Procurement of M60A1 Tank	66	32	56
Development and Continued Procurement of TOW and DRAGON Anti-tank Missiles	119	91	101
Procurement of LANCE Missile System	32	81	95
Procurement of Army Helicopters	126	35	--
Continued Development and Advance Production Engineering for CHEYENNE Helicopter	53	9	54
Continued Development of Heavy Lift Helicopter (HLH)	15	30	53
Continued Development of Utility Tactical Transport Aircraft System (UTTAS)	8	30	64
Air Superiority and Air Defense			
Continued Development/Procurement of F-15 Air Superiority Fighter	349	420	911
Procurement of F-5 E	9	79	101
Procurement and Continued Development of F-14 Multi-Mission Fighter	1,034	1,031	735
Procurement of PHOENIX Missiles	92	104	100
Procurement of Improved HAWK and CHAPARRAL/ VULCAN Surface-to-Air Missile Systems	104	94	106

	(Dollars in Millions) FY 1971 Actual Funding	FY 1972 Planned Funding	FY 1973 Proposed Funding
Air Superiority and Air Defense (Con't)			
Continued Development of a New Surface-to-Air Missile System, SAM-D	83	116	171
Interdiction, Reconnaissance, and Other Combat Aircraft			
Procurement of A-7 Air Force Attack Aircraft	235	224	--
Continued Procurement of F-111 including Over-Target Costs and Performance Testing	626	487	160
Procurement of A-6E and A-7E Attack Aircraft	264	192	214
Continued Development and Procurement of EA-6B Electronic Warfare Aircraft and E-2C Fleet Early Warning Aircraft	308	523	380
Procurement of RF-4C Reconnaissance Aircraft	34	41	--
Close Air Support			
Development of A-X Close Support Aircraft	28	47	48
Procurement of AV-8A Close Support Aircraft for Marine Corps	87	114	133
Development and Initial Procurement of MAVERICK Air-to-Ground Missile	31	91	74
Sea Control and Other Naval Forces			
Procurement/conversion of ASW/AAW Destroyers (10 FY 71; 9 FY 72; 9 FY 73)	653	730	730
2 Nuclear-Powered Guided Missile Frigates, (DLGN-38 class)	206	195	--
Development of CONDOR and HARPOON Long Range, Standoff Missiles	41	60	64
Continued Development of AEGIS Ship Air Defense System (R&D)	72	99	82
Procurement of High Speed Nuclear Attack Submarines (4 FY 71; 5 FY 72; 6 FY 73)	662	904	1,042
Continued Development and Procurement of MK-48 Torpedo	166	182	184
Development and Initial Procurement of S-3A Carrier-Based ASW Aircraft	288	583	666

	(Dollars in Millions) FY 1971 Actual Funding	FY 1972 Planned Funding	FY 1973 Proposed Funding
Sea-Control and Other Naval Forces (Con'd)			
Continued Procurement of the P-3C Land-based ASW Aircraft	169	279	246
Patrol Frigate (Lead Ship)	1	11	193
Sea Control Ship (Advance Procurement)	--	--	10
Development and Test of Surface Effects Ship	20	26	50
Hydrofoil Patrol Craft	--	5	60
Advance Funding for CVN 70	--	--	299
LHA Program (Termination of Program at 5 Ships in FY 1972)	313	110	5
Procurement of Logistic and Support Ships	22	206	218
Procurement of Marine Corps:			
Amphibious Assault Vehicle	40	56	45
Helicopters	17	13	55
HAWK	12	1	21
C-5A Prior Year Unfunded Deficiencies	594	299	208
Miscellaneous			
Other AF Aircraft	(107)	(47)	(103)
VC-X (4 in FY 73)	--	--	19
Trainers (12 in FY 71; 10 in FY 72; 9 in FY 73)	35	47	48
120 UH-1H (300 in FY 71; 120 in FY 73) 1/	72	--	36
DoD Procurement for Other Agencies:	(-)	(-)	(81)
VH-53 (6 in FY 73) White House	--	--	37
VH-1N (6 in FY 73) White House	--	--	12
LC-130R (5 in FY 73) National Science Foundation	--	--	32

1/ Air Force procuring 120 UH-1H for Payback to Army @ $36 million in FY 1973.

conflict intensity ranging from a NATO confrontation with the Warsaw Pact to minor contingencies requiring perhaps only a few brigades or battalions.

The requirements for Army and Marine Forces are determined after consideration of their unique capabilities to satisfy specific requirements under the Total Force Concept. In our force planning we recognize these unique capabilities.

Taking the capabilities of our allies into full account, we have concluded that 13 active Army divisions and 3 Active Marine divisions is the minimum peacetime "baseline" force necessary to support national objectives during FY 1973. To counter a major conflict such as NATO, we would rely heavily upon a ready Reserve Component force of nine more divisions (8 Army, 1 Marine Corps) to reinforce our active forces.

Our strategy requires that we be able to respond to a wide range of potential conflicts against both "light" and "heavy" forces. We have structured and equipped major elements of our Army force to be primarily capable, together with our NATO allies, of defending against conventional attack in Europe against an enemy heavy in armor. At the same time we realize that conflict against less sophisticated forces would require different force capabilities. Other elements of the Army as well as our Marine Amphibious Forces would provide such capabilities.

Structured in this way, our ground forces do provide a necessary flexibility -- with a hard-hitting ground and airborne anti-tank capability in certain elements, and with other elements capable of relatively rapid deployment to global trouble spots.

The Army is continuing to improve its relative overall combat capability as its manpower resources decrease by reducing support forces and where possible trading off support forces for combat forces. The Army is also continuing to seek to improve the capability of their division organization. The Tri-Capability (TRICAP) division was activated in the spring of 1971 as an experimental division combining armored, air cavalry, and air-mobile forces. The TRICAP test program is expected to provide information for a major force decision concerning TRICAP.

In summary, by the end of FY 1972, the active Army force structure will consist of 13 active division equivalents. All 13 divisions are expected to be manned in FY 1973. The active Army will also maintain five separate brigades, one less than in

FY 1972. The Marine Corps will have three active division/wing teams. The reserve land forces will include eight National Guard Divisions and one Marine Corps Reserve Division, and 21 separate Army Reserve component brigades. Excluding the separate brigades, the above forces combine to form total U.S. General Purpose Land Forces of 25 division equivalents at the end of FY 1972, compared to 25-2/3 at the end of FY 1971.

By the end of FY 1972 we will have completed the planned reduction in major land forces from their level at the Vietnam peak. Total active manpower will be 841,000 Army and 198,000 Marines at end-FY 1973, compared with 861,000 and 198,000 respectively, at the end of FY 1972. This will be a reduction of about 838,000 in Army and Marine active manpower from the peak of about 1,877,000 at the end of FY 1968.

a. Modernization of Our Ground Forces

There are a number of important programs which comprise our plan to modernize the ground forces of the Army and Marine Corps. While later witnesses will discuss these in detail, I will highlight several major elements which I believe are of particular importance to our overall objective of improving ground combat effectiveness.

New Main Battle Tank Program. Action has been taken to terminate XM803 (MBT-70) tank development consistent with the action of the Congress last year. The Army has initiated a new tank development program with the immediate goal of defining design and performance characteristics which will enable the Army to field a tank capable of meeting the Main Battle Tank mission within the guidelines and constraints established by Congress. The program will take maximum advantage of lessons learned and technology developed in the MBT-70 program, as well as knowledge and experience gained from other tank and tank related programs conducted in recent years. The funds requested for FY 1973 will sustain both the planning effort and development of the most promising componentry until prototyping of complete systems can begin in FY 1974.

M60 Tanks. To continue improvements and retrofit of the M60 Series tanks, $114 million is included in the FY 1973 Budget. Of this, $10 million will be used for a conservative product improvement program to upgrade the M60 Series tanks, the Army's current main battle tanks. These improvements will provide for better performance and longer life. The remainder is for the production/retrofit of 316 M60A2 tanks. This will complete a program which provides a total of 540 missile firing tanks, not as a substitute for, but to complement our main battle tank.

In addition, the Army plans to continue its procurement of M60A1 tanks and has included $49 million for 166 M60A1 tanks.

TOW and DRAGON. Deployment of the TOW to Europe began in 1970 and by the end of this year the Army will have all of these forces. We used competitive procurement for both launchers and missiles in FY 1972 and will realize a significant reduction in costs.

The DRAGON is a light weight anti-tank system designed to be hand carried by most forward ground combat elements. Like the TOW, it is destined primarily for our European based forces. Funds for the first year's procurement are included in our current budget request.

LANCE. Continued procurement of the LANCE missile system is planned for FY 1973 and $95 million is included for this purpose. This system will replace the aging HONEST JOHN and SERGEANT systems. LANCE will have a primary nuclear warhead capability, and with greater mobility and quicker reaction time, will provide our ground forces in Europe with considerably increased survivable firepower. These improved characteristics will allow the Army to replace HONEST JOHN and SERGEANT battalions with LANCE on a less than one-for-one ratio with significant savings in manpower.

FY 1972 funds for the development and procurement of a non-nuclear warhead for the LANCE were recently deleted by both Congressional Appropriations Committees. The Army is preparing a request for Congressional approval to reprogram funds to continue non-nuclear warhead development. No FY 1973 funds are included for procurement of this warhead.

Advanced Attack Helicopter. During the past year, the Army has made an extensive examination of the handling qualities, weapons accuracy, avionics performance and human engineering of the CHEYENNE Attack Helicopter. Over 1400 hours of test time have been accomplished in the development of the program. The majority of the testing has been under Army supervision at the YUMA Proving Ground and both Army and civilian pilots have participated. The test aircraft have met most of the desired requirements of performance and the weapon subsystem have exceeded the Army's expectations, particularly in day and night firing of the TOW missile. Before any procurement, the Army is also making a detailed evaluation of the attack helicopter concept and the necessary system requirements. In this evaluation, the Army is expanding its evaluation of requirements by examining two industry sponsored prototypes. The results of

this testing effort will be available in early FY 1973. The information obtained from the review of the industry sponsored aircraft and the results of the operational testing of the CHEYENNE together with other information, will provide the basis for a decision to proceed further in FY 1974.

Heavy Lift Helicopter (HLH). The FY 1973 Budget includes $53 million for continued development of the Heavy Lift Helicopter (HLH). Funds will support continued development of the critical components (rotor, transmission, drive system, flight control system, cargo handling system) of a tandem rotor helicopter. Development of engines to power a Test Stand for dynamic critical components will also continue. Funds are provided for initial development of a single prototype.

Utility Tactical Transport Aircraft System. The Army has entered the contract definition phase of development on a helicopter to replace the UH-1H in the air assault role in the 1980's. This helicopter, the Utility Tactical Transport System (UTTAS), will be the Army's first true squad assault helicopter. Its mission will be to transport combat troops and their organic mission-essential equipment in the assault, resupply those units while in combat, and perform the aeromedical evacuation mission. Industry proposals for developing this helicopter are expected on 31 March 1972, and the FY 1973 Budget includes $64 million for this program.

SAM-D. The FY 1973 Budget includes $171 million for engineering development of the SAM-D system which is planned to replace NIKE HERCULES and HAWK whose basic designs date from 1950's.

Technology advances in electronic countermeasures hold the potential for further degradation of our current air defense system effectiveness. SAM-D is being designed to maintain its effectiveness in an intense electronic countermeasure environment. By using the latest in digital signal processing and self-test concepts, the programmed SAM-D replacement of NIKE HERCULES and of HAWK will reduce personnel requirements substantially. FY 1973 will be the first full year of Engineering Development with completion scheduled for the late 1970s.

Marine Corps Modernization Program. The few unilateral Marine Corps development programs normally relate to capabilities peculiar to landing force operations. Such programs as the LVTP-7 and the improved CH-53 Helicopter are good examples. Many other service development programs can, and do, relate directly to Marine Corps requirements. Examples include the DRAGON and REDEYE missile programs. The Marine Corps follows these programs closely, and uses many of these systems once developed.

Modernization of Reserve Ground Forces Components. Turning now to the availability of equipment for allocation to the Reserve components, deliveries of combat serviceable equipment to the Army's Reserve components in Fiscal Year 1971 had a dollar value of about $726 million, compared with our estimate last January of $450 to $600 million. These issues included 6,500 tactical radios, almost 15,000 wheeled vehicles, approximately 287,000 M-16 rifles, and 52 M-60 tanks. Equipment issues for Fiscal Year 1972 are forecast now to exceed $900 million, and in Fiscal Year 1973 they are expected to be more than $1 billion in value. These forecasts are based in part on programmed repair of serviceable, combat capable equipment in depot stocks. This year's budget includes special funds dedicated to the rework of equipment for issue to the Army Guard and Reserve.

If the projected flow of equipment is maintained, the Army's Reserve Components should have 99% of their authorized aviation assets by the end of Fiscal Year 1973 and all substitute and obsolete aircraft should have been withdrawn; other essential equipment requirements for early deployment combat units should also be met by the end of Fiscal Year 1973; and the remaining units should be substantially equipped by the end of Fiscal Year 1976.

The Marine Corps Reserve division units continued to be equipped in phase with the Active Marine Corps divisions. Marine Corps Reserve Aircraft Wing units are also continuing to modernize with CH-46 and CH-53 helicopters replacing the CH-34s and RF-4s replacing the RF-8s. As in the Naval Air Reserve, the A-4Cs are being supplemented by later A-4E and A-4L models.

The ground force modernization programs described in this section, which represent only a portion of our overall modernization program, will definitely improve our force effectiveness. Additional modernization effort is shown on the summary page. In addition, Secretary Froehlke and General Westmoreland will be prepared to discuss in considerable detail all aspects of the Army modernization program, as will Secretary Chafee and General Cushman for Marine Corps programs.

2. Tactical Air Forces

The threat presented earlier poses a wide range of potential conflict situations in which military response might be required. The tactical air force structure described in this section provides to the National Command Authorities a variety of options, ranging from small, conventional deployments to large scale conventional and/or tactical nuclear operations. These forces are being

structured to provide the responsiveness, positive control, and overall capability best suited to provide a wide variety of options to meet the requirements of our strategy.

The flexible nature of tactical air forces enables elements of the combat and supporting forces to be deployed as a package to meet threats to our national interests at the level of theater or subtheater conflict. These contingency force packages can be configured to expressly counter threats to our allies or for minor contingency situations where rapid reinforcement or force presence may be required.

In supporting the overall strategy, tactical aircraft provide a capability to carry out a variety of missions, including close air support, interdiction, counter air (both fleet and area), reconnaissance, tactical airlift, and special purpose missions. The majority of our tactical fighter/attack aircraft are capable of effectively performing several of the fighter and attack missions. The F-4 Phantom is perhaps the most well-know example, although the A-6, A-7 and F-111 also possess this capability.

Close air support missions are flown against enemy forces in close proximity to friendly forces. In FY 72-73 the primary fixed wing close air support aircraft will be the multi-service F-4, the Marine Corps A-4, the Air Force/Navy A-7. As the newer A-7D/Es enter the forces, they will substantially improve close air support and interdiction capability.

Both the Air Force and Navy have the capability to fly interdiction missions against a wide range of land and sea targets. Tactical aircraft with primary interdiction capability are the Air Force F-111, the multi-service F-4, Air Force/Navy A-7, and the Navy/Marine Corps A-6. The capability of these forces are being significantly improved by the addition of the F-111F, the A-6E, and the A-7D/E.

General purpose force air defense/air superiority missions are flown to protect friendly air, sea or ground forces from enemy air attack. The primary aircraft for these missions is the F-4, although the Navy does operate some F-8s for fleet air defense.

Reconnaissance aircraft provide surveillance of enemy activity through day and night photography, side looking radar, and infrared imagery. The Air Force and Marine Corps operate RF-4Cs to provide reconnaissance capability while the Navy operates RA-5Cs and RF-8 aircraft from carriers.

Tactical airlift provides the theater commander the capability to support deployed forces, to forward deploy forces from air and sea ports and to employ and resupply ground combat forces.

Special purpose aircraft are used in electronic warfare (detection of and countermeasures against enemy electronic emitters), special operations forces, tactical air control (enroute and terminal control of tactical aircraft), and airborne early warning (airborne search radar). Our FY 1972-1973 forces include a variety of special purpose aircraft: EC-121s used in SEA, A-37s used to provide ground support in lightly defended areas, Navy E-2s used as airborne radar platforms for the fleet, and EA-6B and EB-66, EB-57 and EC-47 electronic countermeasure aircraft. In addition, the Marine Corps maintains EA-6A aircraft for an ECM capability.

In order to meet the NATO threat, yet retain the flexibility and quick response capability to provide adequate support in Asia and other areas, in FY 1973 the Air Force will operate 72 active fighter/attack squadrons and 39 reserve squadrons. In addition, the Navy will maintain 70 active and 10 reserve Naval fighter/attack squadrons in FY 73. The Marine Corps will operate three active wings and one reserve wing as part of their Division/Wing teams. In addition to these tactical forces of the Air Force, Navy and Marines, 23 active reconnaissance squadrons will be operated along with six reserve squadrons.

a. Modernization of Tactical Air Forces

Modernization of our tactical aircraft forces is needed in order to meet the threat I described in the previous chapter. Newer Soviet aircraft that must be countered include such systems as the FOXBAT and a variable geometry attack aircraft.

Fighters

The increasing number and quality of aircraft being developed by the Soviet Union increases the risk associated with gaining and maintaining air superiority in any potential NATO/Warsaw Pact conflict. Air superiority in such a conflict is essential, if we are to conduct effective close air support and interdiction tasks without undue interference from enemy aircraft. The task of gaining air superiority when the enemy is operating in a friendly radar environment is extremely demanding and requires long-range aircraft with on-board systems for detecting enemy aircraft. The Air Force is developing the F-15 for this purpose. It is specifically designed to excel in air-to-air combat and is expected to have excellent maneuverability -- a vital factor in close-in air-to-air combat. The FY 1973 Budget contains $454.5 million for the F-15

development program, and $422 million for procurement of the first 30 F-15s, plus $34.4 million for initial spares. Emphasis in early FY 1973 will be on obtaining flight testing experience before a production decision is made in the latter part of the fiscal year.

We are carefully examining the advanced technology applicable to the development of a low-cost single-purpose, fighter aircraft that could be procured in large quantities. This prototype project should help us obtain better information on costs and operational suitability before deciding upon development. A total of $46 million is requested for the prototype lightweight fighter program in FY 1973. In addition, with our new emphasis on tailored programs for security assistance to our friends and allies under the Total Force Concept, 90 F-5Es are being procured in the MAP/MASF program to help our allies provide air defense against Soviet type aircraft.

In order to modernize the Navy's tactical aircraft, the Navy is continuing to procure the F-14 in FY 1973 for fleet air defense and air superiority missions. Once operational, the increased capability of the F-14 with the PHOENIX missile system will provide a better defense against the increasing air-to-surface missile threat to the fleet than is currently provided by the F-4. In addition, the increased range and radar capability compared to the F-4 will enable the F-14 to more effectively protect strike aircraft in the force projection mission.

A total of $570.1 million is requested this year for procurement of 48 F-14As. An additional $162.6 million is included in our RDT&E request for the F-14, and $2.1 million for military construction.

There has been a great deal of controversy about the F-14, particularly with respect to its cost and estimated performance. I will discuss the contractual problems in a later section on organization and management. I do regard the existing contract as a valid and binding one.

With respect to F-14A performance, the plane has met specifications to date. Nine aircraft are now in a flying status with full radar and weapons systems tests scheduled during the next few months.

Attack Aircraft

In FY 1973 the Air Force will complete the procurement of three wings of A-7Ds. These aircraft, with the integral computer-aided, visual-delivery system, will provide increased capabilities in the close air support and interdiction mission areas. The A-7Ds are intended to replace the F-100s and a majority of the F-105s in the Air Force inventory.

In addition to the A-7D, we are improving our attack capability by procuring 12 F-111Fs for $160 million in Fy 1973 to complete a fourth wing of F-111s for the Air Force. The Air Force has procured the F-111F primarily for the long-range tactical interdiction role. With its radar bombing capability, the F-111 is particularly useful at night or in bad weather conditions. The F-111 and the A-7 can also serve a role in anti-surface ship operations -- a capability which could be directly applicable to total force operations in areas such as the Mediterranean, the North Sea and the Caribbean.

Reserve Fighter/Attack Aircraft

General Ryan, in his statement to the Congress, indicated the significant progress made by the Air Force in its program to modernize the Air National Guard and the Air Force Reserve. These are ready forces capable of responding on very short notice. Many of these units participate on a continuing basis with the regular forces and can easily integrate into these forces, if activated. The units in the process of transitioning to more modern and capable aircraft are intensifying efforts to complete their readiness training.

By the end of Fiscal Year 1973, the fighter force within the Air National Guard and Air Force Reserve units is expected to include six squadrons of F-105s, one of F-104s and one of F-4s. The attack segment of the Air National Guard is scheduled to have 25 F-100 squadrons, 3 A-37 units, and one unit of B-57Gs. The ANG will also possess one F-105 and one F-100 training squadron, in addition to the number indicated above. Additional modernization will be accomplished as more F-105s and F-4s become available from the Active force.

Modernization of Naval Air Reserve fighter/attack aircraft continued with a second F-8 fighter squadron being formed and a second squadron converting from A-4s to A-7s. All A-4C aircraft are scheduled for replacement with A-4E and A-4L models, and the F-8H fighters will be replaced with F-8Js in Fiscal Year 1973.

Special Purpose Aircraft

In addition to modernizing our fighter and attack aircraft, we are increasing the capability of our tactical air forces by making improvements in special purpose aircraft. The FY 1973 Budget contains $184 million for 7 EA-6Bs and $170 million for 8 E-2Cs, plus $26 million for development of the two aircraft. Funds are included in the FY 1973 budget submission for the development of an Airborne Warning and Control System (AWACS) that can be used not only for strategic air defense, but for tactical air

control as well. The application of AWACS to the tactical mission area will enable the Air Force to consolidate in one aerial platform a variety of the functions, i.e., radio relay, command and control, etc., now being performed by many different aircraft.

The Navy is procuring the EA-6B to provide electronic countermeasures to assist A-7s and A-6s in penetrating sophisticated enemy defense. The Air Force is developing a modification to early F-111s using EA-6B electronics to provide similar escort capability for Air Force interdiction aircraft. Both the Navy and the Air Force are developing airborne early warning aircraft: the Navy is providing the E-2C for fleet air defense while the Air Force is developing a tactical version of AWACS.

The Air Force Reserve added this year a squadron of EC-121s to perform an Airborne Early Warning and Control Mission. Air rescue units of the Air Force Reserve are being completely modernized with the transition to HH-34 helicopters and HC-130 fixed wing rescue craft. ANG tactical reconnaissance units are converting to RF-4s. Some of the former reconnaissance units are converting to the attack mission.

Air Munitions and Missiles

FY 1973 will be the second year of a five-year procurement program to build an inventory of more sophisticated, more effective air munitions. When completed, this modernized air munitions inventory will, through a higher degree of effectiveness per sortie, improve the ability of our fighter/attack aircraft to achieve desirable effectiveness with fewer sorties and less exposure to anti-aircraft defenses.

This air munitions modernization program calls for significant additions of new munitions with better target destruction capability than those currently in the inventory. For example, the FY 1973 Budget contains $128 million funds for: ROCKEYE -- a specially designed cluster bomb with anti-armor applications. The FY 1973 Budget also contains $42 million for laser-guided bombs -- a much more effective free-fall bomb. Moreover, the TV-guided WALLEYE glide bomb program is being modernized to provide a weapon with a larger warhead and greater stand-off range.

Modernization of the tactical air-to-ground missile inventory includes $61 million in FY 1973 for procurement of the TV-guided MAVERICK missile for the Air Force. The MAVERICK, with stand-off features, is designed to provide significant improvement in our anti-armor capability. The FY 1973 R&D budget contains $58 million for HARPOON, a radar-guided anti-ship missile capable of being both

ship-launched and air-launched, and a promising counter to Soviet surface ships capable of launching cruise missiles.

Modernization of the air-to-air missile inventory is aided in FY 1973 by $5 million R&D and $95 million procurement for PHOENIX, $12 million R&D and $97 million procurement for an Improved SPARROW, and $7 million R&D and $29 million procurement for an Improved SIDEWINDER. The PHOENIX missile system is designed to provide the F-14 with a long-range, multi-shot capability for improved fleet air defense capability. The improved SPARROW will be more reliable and more maneuverable in medium range air combat than current SPARROW missiles. The Improved SIDEWINDER will be more effective in close-in maneuvering air combat than earlier versions.

Close Air Support

During the course of last year's hearings the close air support issue was examined extensively, including a special study effort by former Deputy Secretary of Defense David Packard. The first report of his group was submitted to Congress in June 1971, recommending continuation of the development of the Army's CHEYENNE attack helicopter and the Air Force A-X. However, specific tests were outlined for each service to accomplish before procurement would be considered. We expect the first flight of A-X prototypes in June 1972. The two airframe contractors are each building two prototypes that will begin a competitive fly-off in November 1972. A total of $48 million in included in this budget for A-X development. Secretary Seamans has described the program in greater detail.

The report of the Close Air Support Review Group also recommended that we make certain tests with the HARRIER, a multi-mission V/STOL aircraft now being procured for the Marine Corps. We intend to continue with HARRIER procurement, and the FY 1973 budget contains $133 million for another 30 aircraft to provide flexibility in tactical operations.

The Army's development of advanced helicopter gunships is discussed in the section on land forces. The Department is proceeding with the recommended tests, and I have continued the Review Group and have asked it to carefully examine Command and Control aspects of the close air support mission.

3. Sea Control and Other Naval Forces

The U.S. is a maritime nation dependent on sea lines of communication for international trade and support of our allies.

As a maritime nation we strongly support freedom of the high seas for commerce in peacetime, and we must maintain access to vital sea areas in the event of conflict to ensure support to our own forces and European and Pacific allies.

More specifically, in the Atlantic and Mediterranean area our forces, together with those of our NATO allies, should be capable of sea control operations to help ensure protection of deployed U.S. forces, military support shipping and an austere level of economic support.

In addition, U.S. and allied forces should be capable of keeping sea lines of communication to Europe open indefinitely at a minimum necessary supply level against a maximum Soviet naval interdiction effort.

In the Pacific, U. S. forces should be capable of supplementing the forces of our Pacific allies to ensure that a minimum necessary level of supplies can be maintained against expected threats to the sea lanes.

Our basic military strategy reflects these requirements, and a strong Navy is required to fulfill them. However, I would point out that under the Total Force Concept, the forces of our other Services can and do contribute to meeting this requirement, just as allied forces also contribute to overall capability. Moreover, our naval forces can and do operate in support of land operations.

The naval force levels that we are planning for FY 1973 include 16 aircraft carriers, a total of 242 missile cruisers, frigates, destroyers, destroyer escorts, and active naval reserve escorts, 60 nuclear and 27 diesel-powered attack submarines, and 66 amphibious ships. Counting all ships, the program includes a total of 594 active fleet ships and 58 Naval Reserve Force ships. For comparison, the planned end FY 1972 active fleet strength is 657 ships.

a. Modernization of Sea Control and Other Naval Forces

Aircraft Carriers. At the end of FY 1973, the aircraft carrier force will consist of nine FORRESTAL Class or larger, including the nuclear powered ENTERPRISE, plus three MIDWAY Class and four older carriers. The average age of the current carrier force is now over 18 years, with two ships now over 28 years old. Two nuclear powered carriers, NIMITZ and DWIGHT D. EISENHOWER, are under construction and are scheduled for commissioning in 1973 and 1975. The carriers will be ready for operational deployment about one year after commissioning.

As I stated last year, I am convinced that our responsibilities in the Atlantic, the Pacific, the Mediterranean and other ocean areas require that we proceed now with the construction of an additional nuclear powered carrier for the Navy to insure adequate aircraft carrier capabilities for the 1980's and beyond. The CVN-70 is needed to continue the modernization of our sea-based tactical air forces; it will replace an old conventional carrier.

We are requesting $299 million in FY 1973 to procure long lead time items for CVN-70, which the Navy currently estimates will cost almost one billion dollars. The Navy will give details on its current cost estimate in its presentations to the Congress. This carrier, along with the USS ENTERPRISE and the two others currently under construction would provide us with four nuclear carriers, enabling us to operate two on each coast.

Other Programs. We are pursuing several important programs for modernizing and updating our other surface combatants. One of them is the construction of 30 new DD-963 destroyers, to be built by Litton Industries. Sixteen of these ships have already been funded, and the FY 1973 Budget includes $612 million to procure seven more ships. We now plan to procure the last seven of the ships in FY 1974. In addition, the budget includes $118 million to modernize two more guided missile frigates.

The Navy is also proceeding with construction of three new DLGN-38 class frigates, which will be equipped with both anti-aircraft and anti-submarine weapons. These three ships are to be constructed on a multi-year contract.

The weapons systems of our surface combatants presently are undergoing a comprehensive updating. The interim surface-to-surface missile system and surface-to-air missiles such as the STANDARD, BASIC POINT DEFENSE and NATO SEA SPARROW, are providing enhanced defense against certain high performance and long-range targets. In addition, a new surface-to-air missile system, AEGIS, and surface-to-surface system, HARPOON, are under development for our surface combatants. This year, increasing numbers of combatant ships will be equipped with LAMPS helicopters, which will increase the ship's surface surveillance capability and also provide active ASW coverage out beyond the range of ship mounted sonars. Most new surface combatants will have an aircraft capability to complement that of the primary aviation ships.

Naval Reserve surface forces have also been upgraded with more modern destroyers replacing older ships. During this past year the numbers of Naval Reserve ships were increased by three destroyers and three minesweepers. Proposed transfers in FY 1973 are three minesweepers and two tugs, with additional forces, including carriers,

programmed for future years. The Navy is studying plans to place more ships in the naval reserve as Active force levels are reduced.

Increasing emphasis is being given to ship-based aircraft for sea control operations. The Navy is continuing its evaluation of the "CV concept," aboard the USS SARATOGA. This approach involves employing attack, fighter, and ASW aircraft from the same ship, thus vastly increasing the range of threat response available on our carrier decks. The mix of aircraft on each CV will be especially tailored for its mission, ranging from primarily ASW to primarily attack. The Navy's experience to date indicates that the "CV concept" has considerable merit.

The nuclear-powered attack submarine (SSN) is also an important element of our sea control forces. These ships can perform a number of sea control missions. They can be used as barriers across strategic "choke points" to prevent an adversary's forces from getting to sea or returning home. They may also serve as open-ocean search and destroy forces, or in attacking opposing surface ships.

The Navy is continuing its major program to construct new SSN-688 class ships. The number of SSs in the force will decline in future years as more new SSNs are delivered and the Navy moves closer to an all-nuclear force that is highly capable in the ASW role. The new 688-class SSNs will have a propulsion core life of more than ten years, as well as speed and other characteristics that are much improved when compared with those of earlier classes. Twelve of them are already under contract, and the FY 1973 Budget includes $1,042 million to procure six more of these ships.

The submarine's primary weapons system consist of passive sonar and acoustic homing torpedoes. The recently-initiated procurement of the MK-48 torpedo should provide a significant improvement in our combat power. The advanced sonar being installed in the 688 class SSN will also add to this submarine's potential. We are also requesting funds to maintain development options for an advanced high performance SSN and a long range cruise missile.

The MK-48 Torpedo program is of major importance to the effectiveness of U.S. nuclear submarines against the current and projected Soviet naval threat. The MK-48 Mod 1 was selected in July 1971 for quantity procurement. Production is on schedule and this torpedo is scheduled to be introduced into the fleet in the near future. While this program has experienced many problems in the past, the Navy is now proceeding with the operational evaluation, with satisfactory results to date. A total of $184.1 million is included in the FY 1973 Budget for the MK-48. These funds are primarily for procurement of torpedoes and related equipment, but also include $7 million for R&D to exploit the results of the test and evaluation program.

Our air anti-submarine program is designed to provide a balanced force of both sea-based and land-based air ASW forces. Each possesses unique advantages under difference tactical situations and in different tactical domains. The increased range and area coverage and improved sensing devices that our air ASW forces will attain should further enhance the effectiveness of airborne ASW.

The new fixed wing carrier-based ASW aircraft, the S-3A, is planned for fleet introduction in February 1974. This aircraft will be much more effective than the one it replaces, the S-2, and it will help to cope with the large Soviet submarine threat.

The S-3A development program is proceeding on schedule, and has met the first two milestones. The FY 1973 RDT&E budget contains $37 million to complete the major portion of the development effort. We also propose to procure the second increment of production aircraft in FY 1973, and the FY 1973 Budget includes $628 million for 42 aircraft. The budget also includes a small amount for military construction for this program. This procurement, along with the 13 aircraft authorized in FY 1972, will provide sufficient aircraft to convert the first fleet squadrons to S-3As in 1974.

The land-based patrol ASW aircraft are also an important part of our ASW forces. The Navy now maintains a force of 24 squadrons of the land-based P-3 ASW aircraft and expects to retain this force level for the next few years. We have been procuring the new P-3C aircraft with the more capable A-NEW avionics system to replace older P-3As and P-3Bs. These latter aircraft are being transferred to the Reserve forces as they are phased out of the Active forces to replace obsolete P-2 aircraft. The Third Reserve Squadron will complete the transition from P-2s to P-3s in FY 1973.

We propose to continue procurement of the P-3C in FY 1973, and the budget includes $246 million to buy another 24 of these aircraft. Other programs included in the FY 1973 budget to improve sea control capabilities include:

-- Patrol Frigate (PF). The PF will be a relatively small, gas-turbine propelled escort designed to protect convoys, amphibious forces and underway replenishment groups from air and submarine attack. It will not have the size and all the capabilities of our frigates and destroyers, but it should also cost much less than those ships. The FY 1973 Budget includes $193 million to complete design and fund start-up costs, as well as build the lead ship.

-- Sea Control Ship (SCS). Another ship currently in the review and design stage within the Navy is the sea control ship. Current Navy plans call for this ship

to carry a mix of helicopters and Vertical and Short Take-Off and Landing (V/STOL) aircraft to help protect underway replenishment groups, amphibious forces and military convoys. The precise characteristics, size and estimated cost of the SCS are uncertain at this time. We have included $10 million in the FY 1973 Budget to finance the design effort, and hope to move ahead with procurement of the first ship in FY 1974.

-- Surface Effects Ship (SES). The Navy has been working on test surface effects craft of various sizes for the past few years. If successful, this effort should produce ships with speeds in the range of 80-100 knots and capable of reasonably long range operations.

-- Hydrofoil Patrol Boat (PHM). These ships should be about twice as fast as current surface combatants. The Navy plans, in conjunction with NATO allies, to build a missile-carrying hydrofoil boat designed to operate in littoral waters. The FY 1973 Budget includes $60 million for the initial procurement of two PHMs.

The amphibious ship force at the end of FY 1973 will include 67 ships, with a capability to lift the assault elements of slightly more than one Marine Amphibious Force (MAF). To provide modern 20-knot ships, we are procuring five LHAs (a large ship capable of handling both helicopters and surface landing craft) and will accept delivery of the last of 20 new class LSTs.

The LHA construction program is behind schedule. These ships, and the DD-963 destroyers that I mentioned earlier, are being built by Litton Industries in a new shipyard. Problems have been experienced in this new and complex ship facility at Pascagoula, both in technical operation and in recruiting a proper workforce.

The Navy has advised me that LHA design work was not completed on schedule, and that this has retarded the DD-963 ship design work. At this time the LHAs are expected to be delayed 12-16 months, but it is not yet known what impact this delay will have on the DD-963 construction program. The Navy will be prepared to discuss this subject in detail.

In order to minimize fleet dependence on shore facilities, the Navy maintains a force of mobile support ships comprised of Tenders, Underway Replenishment Group (URG) ships, and other support ships. Many of the existing ships are old and obsolescent and in need of replacement. As a start on the modernization needed in this area we have included funds for four new support ships in the FY 1973 Budget.

4. MOBILITY FORCES

a. Missions

A major requirement of our strategy is a capability to deploy initial or augmenting U.S. forces in time to cope with aggression which cannot be met by local forces alone. While our forces deployed forward in peacetime are an essential contribution to deterrence, a major portion of our forces are based in the United States. The objective of U.S. Strategic Mobility Forces is to provide flexibility of deployment so that appropriate military forces can be positioned and supported where and when necessary. The existence of these forces permits an overall force level lower than would otherwise be necessary to constitute a realistic deterrent.

The threats which our general purpose and mobility forces must be capable of meeting range from a minor contingency, requiring one to two brigades to a Warsaw Pact attack on NATO, requiring a number of divisions. Deployments to a minor contingency can for the most part be accomplished with the active military forces. To meet deployment requirements generated by an attack on NATO or Chinese aggression in Asia, we would rely on full mobilization of reserve forces and a large number of commercial aircraft and all available U.S. flag merchant ships in addition to the active force.

Present planning for the spectrum of possible deployments utilizes principally U.S. commercial and military assets. However, recognizing the considerable lift assets of our NATO allies, we are investigating increased participation on their part in supporting deployments to NATO.

b. Airlift

Strategic Airlift

As presently programmed, U.S. strategic airlift resources should provide the basic capability needed to meet our deployment requirements through the 1970's. By the end of FY 1973, the build-up of the C-5 force will be completed, and the active strategic airlift force will consist of 4 squadrons of C-5s (79 aircraft) and 13 squadrons of C-141s (275 aircraft). In addition to these military assets, U.S. mobility forces include approximately 330 commercial aircraft in the Civil Reserve Air Fleet (CRAF).

In FY 1973, we are planning to adjust the aerial ports so that our mobility forces have improved facilities and we are able to use more effectively our airlift system in support of our deployment objectives. We have also made adjustments in the ratio of active to

reserve personnel in our strategic airlift force by reducing the number of active personnel and increasing the number of reserve personnel in the associate units.

Additionally, military strategic airlift has the capability to deliver forces and supplies directly into the combat zone through assault landings and/or airdrop operations.

Tactical Airlift

In contrast to the strategic airlift force, which provides the deployemnt capability for U.S. forces, tactical airlift provides airlift within the contingency area for U.S. and allied forces. This support includes the movement of unit equipment, resupply, and passengers. In FY 1973, our active tactical airlift force will consist of 16 squadrons of C-130E aircraft and one squadron of specialized C-130s stationed in Alaska.

One of our needs in this area is to replace in the active forces the STOL airlift capability transferred to the Reserves and to the Vietnamese in the Vietnamiation program. For this purpose, we are proceeding with a prototype for an Advanced Medium STOL transport program. The aim of this program is to develop an operationally useful prototype aircraft which will provide an option for procurement.

Reserve Airlift

In addition to our increased emphasis on the reserve portion of our strategic airlift force, we have also significantly increased the tactical airlift capability of the Reserve forces.

ANG and USAFR tactical airlift forces have been increased and modernized with the transition from C-124s and the older C-119s to C-130s. The C-7 Caribou will make its debut in the Air Force Reserve this year, and C-123Ks will also be added to provide STOL capability.

The Air Force Reserves will have 17 units equipped with 117 C-130 aircraft and 6 squadrons equipped with 105 STOL aircraft. The Air National Guard will possess 10 units equipped with 81 C-130 aircraft and one specialized C-123 unit in Alaska. The Navy is actively exploring methods of modernizing Naval Reserve airlift units, currently equipped with C-118's, by the introduction of jet transports.

c. Sealift

In the latter half of the 1970's, without acquisition of new

assets, our strategic sealift force of dry cargo ships will be limited to three roll-on/roll-off vessels. To meet wartime needs, we must rely almost exclusively on U.S. commercial shipping which can be mobilized under Presidential authority. During a NATO contingency, we could rely on the commercial shipping assets of our NATO allies although the availability of these ships in a contingency is questionable. In the next several months, we will be working with our allies to develop agreements regarding the earlier availability of such NATO-flag vessels. Despite these U.S. and foreign commercial shipping resources, however, we would also require specialized shipping, not currently available from commercial sources.

Military sealift procurement, requirements, and capabilities are currently undergoing an extensive interagency review entitled the Sealift Procurement and National Security (SPANS) Study. We are participating in this study along with the Department of Commerce, Federal Maritime Commission, the Office of Management and Budget, and Industry. We now expect the SPANS Study to be completed by the end of March, 1972, and recommendations should be forthcoming on the following issues: (1) possible revision of the competitive negotiated procurement system used to obtain rates for the movement of peacetime cargo under shipping and container agreements; (2) the need to acquire specially designed vessels for a fleet controlled by the Department of Defense, and (3) the development of a strengthened Sealift Readiness Program which will make available in a timely manner sufficient commercial shipping resources to meet the requirements of minor contingencies.

In addition to addressing these issues, the SPAN Study will also provide the factual basis necessary to update the agreement developed in 1954 between the Secretaries of Defense and Commerce (Wilson-Weeks Agreement) concerning the use of merchant shipping resources by DoD. If the government is to realize fully the benefits of the maritime/sealift programs of these two agencies, an effective policy must be jointly developed.

F. NEW INITIATIVES IN TOTAL FORCE PLANNING

As I reported last year, the Strategy of Realistic Deterrence calls for new initiatives and new concepts to complement Total Force Planning. Some of these initiatives will fall in areas where the U.S. bears the primary responsibility, while others stem from closer integration of our planning with that of our friends and allies. Some may more properly be called new directions or redirections of effort, rather than initiatives. Regardless of what we call them, we believe they are necessary--to modernize our forces, reshape them to future environments, and to provide for our security.

1. U.S. Force Planning Initiatives

Last year I described a number of initiatives that we were taking in order to strengthen our forces. This year we hope to build upon these initiatives begun last year, add new ones, and make them a successful part of our overall force planning.

One new initiative under the Total Force Concept relates to Air Force-Navy cooperation to counter Soviet naval threats. Additional tests of the effectiveness of guided weapons against surface vessels are in progress. The Air Force has developed tactics and has updated training manuals for ship attacks. In addition, we are developing plans to take full advantage of the versatility, range, sensors, and weaponry of our new aircraft to assure that our total forces can continue to deal effectively with the Soviet surface fleet.

The Army is also experimenting with the TRI-CAP division. Initial results on the TRI-CAP division look favorable, but we will not be in a position to thoroughly evaluate the utility of this concept until further tests have been completed.

The Navy is studying the possibility of using merchant ships for underway replenishment and rapid deployments in a wartime contingency. The advantage would be to reduce the need for shipbuilding funds to procure new Navy support ships. The Navy will test the feasibility of using a commercial tanker to refuel Navy ships in a series of tests early this year.

Another new item the Navy is considering is the homeporting overseas of fleet units forward deployed. This action could enable us to get better utilization from our force levels during peacetime without adverse family separation effect. Some units are already established in Japan and the Philippines, and we are now examining the merits of additional forward deployments in the Mediterranean, Western Pacific, and Northern Europe.

Indicative of Total Force Planning within the Air Force are the new initiatives which assign a greater share of the CONUS air defense tasks to the Air National Guard. During 1973, the number of Air National Guard units committed to air defense will increase to 24 from a total of 17 units in FY 1972. Notably, this increase of about 24% will result in ANG units possessing more than two-thirds of the total interceptor aircraft assigned to CONUS air defense. These factors illustrate the potential of the Air Reserve Forces to perform essential tasks under the Total Force Concept.

We intend to continue searching for new initiatives that can improve force capabilities and readiness. We will also pursue other new initiatives, both in the area of technology, and in planning with our allies.

2. The U. S. Technology Base and Technological Initiatives

Research and development effort continues as a key factor in Free World capabilities to deter a wide spectrum of conflict.

Maintaining technological superiority requires a dynamic research, exploratory and advanced development effort. The Soviets appear to be seeking to surpass us in military related technological efforts, but we intend to maintain clear military technological superiority. We cannot afford the loss of that superiority. We simply cannot compete with a closed, secretive society without the confidence of knowing the "upper limit" of their military offensive potential at all levels of warfare -- and we can know this only if we have technological superiority.

These latter requirements on the Defense RDT&E community are substantially independent of force levels. As I explained last year, we are continuing to support increased RDT&E expenditures in the face of an overall declining force level. The sheer magnitude and trend of Soviet scientific/technological endeavors appears to be unchanged from last year, and it is obvious that the Soviets are mounting a severe challenge to our own present technological superiority. We know that their latest research in several areas is comparable to our own.

This year, in order to maintain our technological superiority, we are requesting a substantial increase over last year and insisting that the Defense community find better management techniques to stretch the productivity of their efforts. Dr. Foster will describe our efforts in greater detail.

There is one area I would like to describe in which we are seeking to get more from our R&D investment. It involves a greater effort to adopt allied developments to our own requirements as a means of increasing the productivity of our combined Free World efforts. This approach clearly represents an example of successful implementation of the Total Force Concept and a step forward in the Administration's policy of partnership. The severe competition for national resources makes it virtually impossible for the U.S. to plan to retain technological superiority across the full spectrum of defense technology all by itself.

Our European and Pacific Allies have built up a strong technological capability at an impressive rate. Collectively these Allies spend about $3 billion on R&D for tactical weapons, approximately equivalent to the U.S. effort. We have begun a major effort with our allies in an attempt to achieve better coordination of our R&D programs, so that we can better benefit from the advances made by our allies in tactical weapon technology. By doing so, it may be possible to increase our own R&D efforts in critical scientific frontiers, which can be of major help in maintaining our lead in advanced technology so vital to our security.

This implements the Total Force Concept in an important new way. It means that the U.S. would depend on its allies for some of its development needs. This dependence would not affect our economy because we would intend, with the help of our industry, to produce any selected allied weapon systems here in the U.S. To this end, we have undertaken to provide our industry a greater degree of freedom in establishing working relationships with European and other allied industries. We do not expect that this dependence will ever be more than a small percentage of the overall U.S. defense effort. But for its small size, we would expect large improvements by reductions in international duplicative developments which will help us and our allies while increasing the bonds of partnership and solidarity between us.

We also see some benefit in competitive international developments in tactical weapons. By emphasizing hardware prototypes and testing them realistically in the field, we can obtain better equipment at less cost. This testing can serve the U.S. needs for competition. If we and our allies can learn to depend on and select the winner for our inventories, we can make an important contribution toward improving standardization, compatibility and interoperability of our forces in the field. This would be a significant step towards reversing a deteriorating trend in this area.

We have also expanded our technological data exchange programs with our Allies and instituted new programs. For example, we have

exchanged data with the Republic of Korea, in the hope of establishing an improved technological base for them to develop and produce basic spares and equipment. We believe that this data exchange program is important, because it is through such information exchange programs that the first steps are taken to harmonize requirements and coordinate research and development plans.

Dr. Foster and his staff have explored the promises and potentials of international cooperation with our allies within the parameters described above. He will discuss this matter in more detail and describe examples where interdependence in R&D between us and our allies could benefit the U.S. and improve the overall Free World defense posture.

G. REGIONAL CONSIDERATIONS AND TOTAL FORCE PLANNING

1. Total Force Planning in Europe

Our general purpose theater force requirements are largely determined by planning for U.S. and allied conventional forces which will deter the Warsaw Pact nations from conventional attack of NATO Europe. We and our allies also must insure -- and display -- our ability to sustain and reinforce our deployed forces and those of our allies through control of the air and sea lanes.

Our force planning for NATO has been developed to implement our agreed strategy. In this regard, it is appropriate to note what the Defense Ministers stated in their communique of December 8, 1970:

> "Ministers confirmed the continued validity of the NATO strategy of flexibility in response, which includes forward defense, reinforcements of the flanks and capabilities for rapid mobilization, and calls for the maintenance of military capabilities which are able to provide an appropriate counter to any aggression. They noted the continuous rise in Soviet defense and defense-related expenditure and the evidence that the USSR is continuing to strengthen still further its military establishment, including that in the maritime field where Soviet power and the range of its activity have markedly increased. They, therefore, emphasize the need for improvements in NATO's conventional deterrent, as well as the maintenance of a sufficient and modern tactical and strategic nuclear deterrent.

> "The security of NATO being indivisible, Ministers underlined the special military and political role of North American forces present in Europe as an irreplaceable contribution to the common defense."

Our relationship with our NATO allies during this past year provides an excellent example of the Total Force Planning Concept at work.

a. NATO Planning in Perspective

You will recall that in the early stages of this Administration, we undertook an intensive review of our defense needs, deficiencies and policies in Europe. We also worked closely with the allies in a parallel study effort pertaining to NATO as a whole. From this comprehensive assessment and intense consultation with our Allies emerged the NATO Study on Alliance Defense Problems in the 1970's, known as AD-70.

In December 1970, the NATO Ministers approved this study at the Ministerial Meeting in Brussels, identifying the specific deficiencies in NATO's conventional defenses and establishing an action program of force improvements designed to reduce imbalances between NATO and Warsaw Pact conventional capabilities. At that same meeting, the European allies initiated the European Defense Improvement Program (EDIP) of about $1 billion of additional expenditures over the following five years, about half for improvements to their own forces and the remainder for a program of aircraft survival measures consisting of the construction of aircraft shelters and related protective facilities. A large number of these shelters will be for U.S. aircraft but at about 30% of the cost in U.S. military construction funds, since there will be about 70% recoupment from EDIP funds.

At the December 1971 Ministerial Meeting, the Ministers assigned priority areas within the overall AD-70 program of force improvements for early action.

On December 7, just prior to the Ministerial Meeting, the Euro-Group Nations, which set up the special European Defense Improvement Plan in 1970 (UK, FRG, Belgium, Netherlands, Luxembourg, Italy, Norway, Denmark, Greece and Turkey), announced a combined total increase in their 1972 Defense Budget of over $1 billion, and identified significant improvements along AD-70 lines.

b. U. S. and Allied Cooperation in NATO

The past year has been one of considerable stability in Europe, and of the expansion of cooperation within the NATO alliance. The

alliance defense effort has been put on its most solid footing in many years as a result of the NATO AD-70 efforts, the desire of the Europeans to show that they are definitely shouldering their part of the NATO defense burden, and our own efforts to restore the readiness of our forces in Europe.

That our efforts have been reasonably successful in the past year is, however, no reason for complacency. The common coordinated force improvements must be sustained, because we see no slackening of Warsaw Pact defense capabilities, but rather improvements.

On the whole, I am pleased with allied efforts to assume a greater role in the collective defense effort. In this connection, I want to make special mention of the two-year Offset Agreement just concluded with the Federal Republic of Germany in December in Brussels. This is another tangible example of the progress we have made toward achieving the President's goal of a greater sharing of the burdens of the alliance. I would like to call attention to one feature of that agreement in particular. The Federal Republic has embarked on an extensive program of 600 million Deutsch Marks (about $183 million) to refurbish at no cost to the U.S. the antiquated facilities in which our troops have been living. I have been personally concerned that everything be done to insure that our troops enjoy adequate living conditions.

1. Allied Improvement Efforts

The EDIP program announced by our Allies in December 1970 is being rapidly implemented. Over two-thirds of the total program of aircraft survival measures (i.e., shelters and other facilities) is already the subject of definite NATO programming or implementation action. Action on special national force improvements announced as a part of EDIP are also moving forward on schedule.

But the EDIP is only a small part of the European contribution to the Alliance. For the year 1972, almost all of our allies are planning increases in their defense budgets. As I noted earlier, at current prices the total planned increase for 1972 is well over $1 billion, without counting certain possible supplementary budget appropriations to meet further rises in costs. Our allies in the last few years have also taken important steps to modernize the structure and equipment of their forces. These steps are generally in consonance with the priorities established in the AD-70 study, and the allies are also engaged in reexamining and where necessary reshaping their ongoing defense programs to fit those priorities. They have important programs for the modernization of their forces.

Our allies have made clear that the maintenance of their force levels and their extensive improvement programs are worthwhile because of the continued U.S. commitment to NATO defense, given the high quality of U.S. forces, and the critical part they play in NATO defense plans. They have also made clear that efforts to achieve sufficient defense capabilities are a necessary precondition to realistic negotiations on security and cooperation in Europe.

2. Improvements to U.S. Forces in Europe

The U.S. is also making a strong effort to maintain and improve its forces in Europe. During the past five years, manpower shortages and personnel turnover have caused readiness problems for U.S. forces in Europe. In the past year we raised the priority of European forces for personnel, and the units are now at virtually 100% of authorized manning.

We plan to continue our FY 1973 force deployments to Europe at current levels, with minor adjustments as appropriate consistent with force modernization and improvement in efficiency of support components.

Modernization of the equipment of U.S. forces is also progressing well. In the first instance, we are making significant improvements in our anti-armor capabilities. The TOW anti-tank guided missile is being introduced in significant numbers now, and the smaller DRAGON missile will follow. We will soon introduce the M60A2 tank with stabilized guns and SHILLELAGH missile launchers with a new laser range finder. Our program to replace gasoline-drive armored personnel carriers with new and improved diesel models is nearing completion. We have almost completed modernization of the helicopter fleet and are equipping Army aviation units with new transports. We plan to deploy the LANCE missile to Europe as scheduled.

For our tactical air forces, we will complete conversion of F-100 aircraft to F-111 and F-4 in FY 1973. We have already built some 360 aircraft shelters and should finish the program with over 400 by the end of calendar 1972. We also hope to decrease force vulnerability by increasing the number of available dispersal bases and thus reduce wartime air base loading.

In addition to our own force improvements, both made and planned, we have offered recommendations to the allies for additional measures to bolster allied security. In the spring of 1971, we proposed certain new weaponry for NATO forces.

We further called upon the allies to take a greater role in coping with increasing Soviet naval capabilities in the Norwegian Sea and Mediterranean areas. We have also encouraged the allies to consider and suggest still other measures with which all of us might be able to further enhance our collective capability.

Another significant feature in allied defense planning is the work of the NATO Nuclear Planning Group. The activities of this Group, including the Ministerial sessions that I attend with my colleagues, represent one of the most important and valuable examples of Alliance cooperation.

At the two Ministerial sessions of the Nuclear Planning Group during the past year, I presented briefings on the balance of strategic forces, and shared in frank and useful exchanges with my colleagues on the implications for NATO of recent trends and developments in this area. The major field of work by the Nuclear Planning Group has been a continuing series of studies on the tactical use of nuclear weapons in defense of the Treaty area in support of the strategy of flexible response. A number of studies were completed during the past year, including one that German Minister of Defense Schmidt and I presented to the Nuclear Planning Group in October. These studies have given valuable insights into a critical area of NATO defense. This work program is expected to assist in the development of further guidance on the tactical use of nuclear weapons to augment the political guidelines for their use in defense of NATO approved in 1969. This effort will constitute a vitally important and challenging task for the Nuclear Planning Group in the months ahead.

c. Negotiations Aspects

Our NATO allies are clearly aware of President Nixon's program to move from confrontation into negotiation. At the December 1971 Ministerial meeting, the allies recognized the importance of maintaining our strength and partnership while moving toward detente, reaffirming the Alliance position that its overall military capability should not be reduced except in the context of mutual and balanced force reductions. For our part, we reaffirmed the U.S. position that, given a similar approach by the other allies, the United States would maintain and improve its forces in Europe and would not reduce them except in the context of reciprocal East-West action.

We are working closely with our NATO allies in preparing for possible negotiations on mutual and balanced force reductions (MBFR)

in Europe. Over the past year our Government submitted to NATO three major studies on this subject, and we intend to submit the results of future studies as they become available. Only by working closely together can we insure that allied solidarity is preserved.

Our objective, as we move forward with our Allies in developing positions on MBFR, is the maintenance of Alliance security, with a more stable military balance at lower levels of forces. We are considering MBFR in a comprehensive manner, focusing on a combination of reductions, collateral constraints (such as limitations on exercises), and verification provisions. We have concluded that NATO force improvements and MBFR must complement each other; we will need to move forward with force improvements before, during, and after MBFR negotiations.

We are confident that our efforts will ensure that we are thoroughly prepared for MBFR negotiations at such a time as they can be brought about. In this regard, Allied Ministers have invited the Warsaw Pact to hold exploratory talks on MBFR, and Mr. Manlio Brosio has been appointed and given a mandate to explore this subject. Although the USSR and the Pact have failed to date to respond to these NATO initiatives, we and our allies remain prepared to discuss MBFR should they see fit to respond.

d. Summary

Clearly, the year 1971 has been a year of progress in working together with our European Allies in maintaining and improving our own and allied forces to meet the common threat and to share the common defense burdens more equitably. The historic decisions of the December 1970 Ministerial meeting were given impetus during the past year and received new emphasis from the NATO Ministers at their December 1971 meeting in Brussels. I have been heartened by this demonstration of allied spirit in response to U.S. and allied needs in Europe. This integrated planning effort and action program is most essential to provide for our common security, especially in light of the continuing expansion of military power and potentials by Warsaw Pact nations. It is essential to the allied partnership, and it is essential to the maintenance of a position of strength from which to negotiate differences with our adversaries in the pursuit of peace.

2. Total Force Planning in Asia

> "In the next decade our Asia policy will be dealing simultaneously with three phases of Asian development. In some countries, there will still be an absolute -- though we hope diminishing -- need for us to play a central role in helping them

meet their security and economic requirements. In others, we will complete the process of adjusting our relationship to the concepts of the Nixon Doctrine. And with all countries, we will be striving to establish a new and stable structure reflecting the renewed vigor of the smaller Asian states, the expanding role of Japan, and the changing interests of the Soviet Union and the Peoples Republic of China. . ."

President's Foreign Policy
Report to Congress, 1971

The United States is a Pacific power, and as such must recognize and accept its responsibilities in the area. We seek to do so as a partner, as one of a group of concerned nations acting in concert. It is our objective to support our allies and fulfill our treaty commitments in the context of the Nixon Doctrine.

Last year I noted that we do not plan for the long term to maintain separate large U.S. ground combat forces specifically oriented to the Asian theater alone, but we do intend to maintain strong air, naval and support capabilities. To serve as a deterrent and to support our allies, we continue, of course, to maintain balanced, forward deployed ground, air and naval forces in the Asian theater. However, we expect to continue to emphasize the strengthening of the military capabilities of our friends and allies, as we move toward Nixon Doctrine peacetime deterrent forces.

The forces and assistance which are provided in the FY 1973 Budget will enable us to continue to provide essential U. S. capabilities while moving in this direction in our planning.

Thus, in Asia, our primary emphasis lies in assisting our friends and allies in developing their own capabilities to cope with aggression, against both internal and external threats. In this sense, U.S. forces will increasingly serve a complementary role, and our security assistance programs are a key to making progress in this direction. I believe that we and the Asian nations have made considerable progress in this direction in the past year.

Final agreement has been reached with Japan on the reversion of Okinawa in 1972. Japan is to begin assuming responsibility for the immediate defense of the Ryukyu Islands.

The Republic of Korea has assumed responsibility for the defense of virtually all the Korean DMZ and, with our assistance, is undertaking substantial improvement of her own forces.

We have completed significant reductions in our own force deployments in the Philippines, Japan, Korea, and Thailand.

There is also concrete evidence of the dynamism and regionalism that exist in this region. In this regard, Australia, New Zealand and the UK reached agreement with Malaysia and Singapore on the continued forward deployment of an integrated ANZUK defense force in the two Southeast Asia countries under the new Five Power Defense arrangement.

Thus, although 1971 has been a year of progress, with progress must come change and change is not without its problems. We recognize that as these changes take place, problems and differences must and will arise in our relationships with the nations of Asia. We have sought to minimize the differences and we have laid stress on our many common aspirations; however, we do not hide from problems. We seek straightforward, honest nogotiations to find mutually satisfactory solutions. To facilitate this dialogue and emphasize the new role of partnership we seek, both former Deputy Secretary Packard and I traveled to the Far East this past year to discuss with our friends our common security objectives and means to accomplish them.

Japan

As we have all come to recognize in recent years, Japan's growing power on the Asian scene will make her one of the keys to peace and stability in Asia in the years ahead. The importance we attach to maintaining a close security relationship with Japan was underscored by the President in his meeting with Prime Minister Sato at San Clemente in January. A large share of their time together was devoted to a review of our mutal interests in the broad security problems of the Asian region. As they announced at the end of those meetings, and as I said after my trip to Japan last summer, the approaches of our two countries to these problems are complementary.

While some public opposition to our bases still persists in Japan and Okinawa, the Japanese Government recognizes the regional security role our forces play, and their ultimate relevance to Japan's defense. For our part, we are making every effort to streamline our base structure in Japan and Okinawa, and to keep our military deployments there to the minimum compatible with our mutually agreed security interests. In January of this year we reached general agreement with the Japanese Government on yet another consolidation of our military activities and reduction of our land use in the populous Kanto Plain area around Tokyo. As

a part of the Okinawa reversion agreement, the whole or part of 34 facilities and areas on Okinawa will be returned. Additionally, 12 facilities will be turned over to the Japanese self-defense forces as they assume Okinawa's defense mission.

For her part, Japan has embarked on a fourth Five-Year Defense plan designed to improve qualitatively her self-defense forces to better perform their assigned task of defending the home islands. When the reversion of Okinawa takes place on May 15, 1972, Japan will begin to assume responsibility for the immediate defense of the Ryukyu Islands.

As a result of my trip to Japan last summer, I gained a better appreciation of Japan's need for military equipment modernization if her forces are to become effective against sophisticated threats. Accordingly, we are encouraging Japan to modernize the equipment of her forces, and have placed our technical services at the disposal of the Japanese to help assess their needs and determine what equipment we might be able to provide within Japanese budget constraints.

Korea

Our relations with the Republic of Korea provide an excellent example of the Nixon Doctrine at work as I saw on my visit there last year. As 1970 closed, the Republic of Korea continued to face across the demilitarized zone a hostile North Korean regime. Considerable effort was required during 1971 to prevent incursions of saboteurs and agents from North Korea and to apprehend those personnel who succeeded in entering the country, and this type of activity continues. North Korea continues to maintain the fourth largest Army in the communist world and to improve her military posture. It was in this environment that we and the Republic of Korea moved forward in 1971 to implement the Nixon Doctrine and our new strategy. These have been the achievements:

-- U.S. troops no longer man any significant portion of the DMZ where they had been stationed since the cessation of hostilities in 1953.

-- ROK troops now have assumed responsibility for the security of the line dividing the two halves of Korea, with the exception of the very small portion devoted to the Military Armistice talks.

-- Authorized U.S. troop strength was reduced over the last year from some 60,000 men to the present strength of about 40,000.

-- A Five Year Modernization Program for the Republic of Korea Armed Forces has been instituted which, with Congressional sanction and support, will enable the Koreans to maintain an adequate defense posture. In addition, the ROK is taking steps to increase its own self-sufficiency by providing, through its own defense budget, items previously supplied by the U.S. which can be readily procured in Korea.

Cambodia

President Nixon said on November 12, 1971:

> ". . . Cambodia is the Nixon Doctrine in its purest form. Vietnam was in violation of the Nixon Doctrine. Because in Cambodia what we are doing is helping the Cambodians to help themselves, and we are doing that rather than to go in and do the fighting ourselves, as we did in Korea and as we did in Vietnam."

During the past year, the U.S. security assistance program in Cambodia has been an excellent example of how we believe the Nixon Doctrine should be implemented. In the first place, U.S. assistance is confined to military and economic aid, and some air support, with Cambodia assuming the basic responsibility for its own self-defense. The U.S. has no ground troops and no military advisers in Cambodia.

Additionally, the U.S. assistance effort is being complemented by military and economic aid from a growing number of Cambodia's friends in East Asia and the world. In January, a group of seven countries agreed to contribute to an economic stabilization fund for Cambodia. The most direct assistance, of course, is coming from South Vietnam. Indeed, one of the most encouraging developments of the last year was the increasing number of combined operations conducted by Cambodian and South Vietnamese forces against NVA/VC forces in Eastern Cambodia.

Most heartening of all has been Cambodia's own efforts to defend her territory and people against the North Vietnamese invaders. Cambodia has expanded its military manpower six-fold in the past year and has been able to maintain the major populated areas under government control. Despite enemy interdiction efforts, Cambodia has kept open the major highways and is now assuming responsibility for Mekong River convoys from the South Vietnamese border to Phnom Penh.

These Cambodian efforts have, of course, also placed additional strain on the NVA/VC logistical system and helped to relieve pressure on U.S. and allied forces in South Vietnam. Thus, in the military area there has been considerable progress in the past year. But much more still needs to be done, particularly in the fields of training and logistics. These are the tasks we and our friends will be assisting Cambodia with in the coming year.

Vietnam

> "Vietnamization . . . has now effectively concluded the U.S. ground combat responsibility. Our other activities are being transferred to the South Vietnamese. We are ending American involvement in the war while making it possible for those who do not wish to be dominated by outside forces to carry on their own defense."
>
> President's Foreign Policy Report to Congress, 1972

The President in his Foreign Policy Report to the Congress has presented a comprehensive and detailed review of all aspects of our Vietnam policy. I would like in this Report to highlight those dimensions which are of particular concern to me as Secretary of Defense.

Vietnam became the test case and the first crucial step for implementing the Nixon Doctrine and our new planning approach to Asia. Vietnamization was based on the simple proposition that responsibility for the war should be turned over to the South Vietnamese. We expected them to defend themselves with our material and security assistance but without indefinite American combat involvement. The results to date have justified, in my view, the faith we placed in this new policy and in our South Vietnamese friends.

When we assumed office in January 1969, Americans were deeply involved in combat. And so we set out systematically to bring Vietnam into conformity with the principles of the Nixon Doctrine. 1971 has demonstrated the viability and effectiveness of the Nixon Doctrine principles we have applied in Vietnam.

The Vietnamization program has paved the way for a self-reliant South Vietnamese defense force, for increased cooperation among the other free nations of mainland Southeast Asia and for eventual restoration and maintenance of peace in Indochina. Should our approach to peace in Indochina through negotiations fail, our

strength through partnership approach will continue to make possible reductions in the level and intensity of the present conflict.

The Vietnamization program was planned in three phases:

-- Phase I- Assumption by South Vietnam of the ground combat role against Viet Cong and North Vietnamese forces. Phase I was completed last year.

-- Phase II - Development by South Vietnam of those support capabilities -- air, naval, artillery, logistics and other support -- necessary to maintain effective security. Major progress was made last year notably including the turnover of in-country naval operations and a very substantial portion of the in-country air combat responsibilities.

-- Phase III - Reduction of American presence to a military advisory mission, with whatever small security forces are needed to protect this mission, and then further reductions as South Vietnam becomes capable of handling the threat with no U.S. military presence required.

Our activity in Indochina has been and will continue to be in consonance with the goals we established at the beginning of Vietnamization. We seek to:

-- Maintain our obligations and interests in Asia as we move toward a generation of peace;

-- Reduce American casualties:

-- Secure the release of our Prisoners of War and an accounting for our missing in action.

-- Continue to withdraw U.S. forces; and

-- Transfer military responsibility to the Republic of Vietnam in a way that provides the South Vietnamese with a realistic capability to defend itself from aggression.

We are closer now to meeting these goals than at any time in the past. During each of my four trips to Vietnam as Secretary of Defense, I have been heartened by the progress which has permitted me to recommend and the President to direct further reductions in U.S. troop strength.

As I prepare this Report, the situation in Vietnam remains encouraging. Phase I of Vietnamization is completed, with only a small U.S. ground combat force remaining in a security role to protect U.S. forces as Phase II progresses. Phase II is progressing ahead of schedule as the Vietnamese themselves work hard to complete the complex training required before they can fully assume an effective support role. Phase III has begun with the reorganization of our corps and field force headquarters to assistance commands and with reductions contemplated in our military headquarters in Saigon.

In sum, the major part of our Vietnamization program has been accomplished and we are ahead of schedule on the tasks that remain. The philosophy that predominated as we assumed office in 1969 of a U.S. "takeover" of military activities in South Vietnam has been superseded by the reality now of a U.S. "turnover" of responsibility for continued combat operations, as every statistical indicator confirms. Vietnamese forces have demonstrated professional skill, valor and combined arms effectiveness in their operations to date. Particularly noteworthy has been the ability of the Vietnamese to operate away from their permanent bases in areas the enemy has occupied for years. While we cannot expect the South Vietnamese to win every battle, their effectiveness should increase even more as they gain more confidence and strength.

During my second trip to Vietnam in February 1970, I encouraged greater coordination of our military activities with the economic aspects of Vietnamization. The economic implications of Vietnamization are complex but the response to our new emphasis has been encouraging. The burden of defense reduced the availability of goods and services to Vietnam and its people. The result was a rampant inflation; prices rose by 650 percent in the five-year period ended June 1970. The withdrawal of U.S. forces and the consequent reduction in Vietnam's foreign exchange earnings threatened the economy still further. The Vietnamese themselves, however, are displaying a growing economic sophistication and learning to control their wartime economy. Government-instituted reform measures in September and October of 1970 and in March and November of 1971 have addressed many of the economic difficulties facing the Republic of Vietnam with the latest reforms stressing self-sufficiency as a goal. In addition, a reorientation of our economic assistance programs has contributed to achievement of relative stability and enhancement of prospects for growth.

The implication of this improvement in the economy of Vietnam is that the Vietnamese will soon be able to shoulder more of the financial cost of providing for their security while at the same time they benefit from the higher standards of living which increased

security and economic stability and growth assure. Nevertheless, continued substantial U.S. economic assistance will be needed for the foreseeable future.

With respect to negotiations, the President's recent nationwide address on January 25, 1972, and the detailed description of our efforts to achieve a settlement presented in his Foreign Policy Report conclusively demonstrate our willingness and Hanoi's refusal to date to achieve an early and honorable peace through negotiations. In this connection the President described, and I would like to underscore our deep concern for the American servicemen now held captive by the North Vietnamese and Viet Cong in Indochina, and for those missing in action. The other side has continued to violate the provisions of the 1949 Geneva Convention with regard to prisoners of war and to ignore the protests of the United States and the civilized world. Hanoi's violations of the Geneva Convention are as follows:

The Geneva Convention requires that prisoners be humanely treated and protected. This provision has been consistently violated.

The Geneva Convention requires that neutral inspection of prisoner camps be permitted, including interviews of the prisoners without witnesses in attendance. The enemy has never permitted such inspection or such interviews.

The Geneva Convention requires that the names of all prisoners be released promptly. Such names as the enemy has released have not been released promptly nor through regular channels.

The Geneva Convention requires notification of deaths in captivity and full information on the circumstances and place of burial. The enemy has not furnished any information about circumstances of death and place of burial.

The Geneva Convention requires that prisoner of war camps be marked clearly and their location be made public. The enemy has not marked its camps nor divulged their location.

The Geneva Convention requires that the seriously sick and wounded be repatriated or interned in a neutral country. The enemy has refused to comply with this provision.

The Geneva Convention requires that prisoners be permitted to send at least 2 letters and 4 cards a month. The average has been 2 or 3 letters a year and none at all from some prisoners.

The Geneva Convention requires that sufficient food must be given to prisoners. Yet, all of the released prisoners have been found to be underweight and suffering from malnutrition.

The Geneva Convention requires that prisoners not be held in close confinement. Yet, the enemy has held some men in solitary confinement for years.

The behavior of the enemy in flouting the basic precepts of humanity and international conventions and in contributing to the anguish of our POW/MIA families must end. Neither President Nixon nor I will consider Vietnamization to be completed until the Prisoner-of-War and Missing-in-Action issues have been resolved.

3. Total Force Planning and Security Assistance

In deterring subtheater or localized warfare, i.e., non-nuclear conflict that does not involve the USSR or PRC in combat, the country or ally which is directly threatened bears the primary burden, particularly for providing the manpower for its defense.

We believe that our allies can and must increasingly bear the primary burden for planning to cope with subtheather and localized conflicts. Such conflicts, running from localized insurgency or guerrilla warfare to the type of conventional attack which North Korea itself could mount against South Korea will continue to threaten the security of our friends and allies through the 1970's. Although security assistance is not limited to the friends and allies threatened by subtheather/localized conflict, in practice, the bulk of our assistance goes to these countries.

A strong, effective program of security assistance to key friends and allies is an indispensable tool for implementing our National Security strategy of Realistic Deterrence. It also plays a central role in fulfilling the Nixon Doctrine objective of a more equitable sharing of the Free World defense burden.

President Nixon has indicated that in the future the U. S. would look to the forces of our allies to deal with guerrilla and subversive threats. However, he emphasized that the United States can and will furnish military and economic assistance to supplement this local effort, where our interests are involved. Elaborating on that theme in his Foreign Aid Message to the Congress on April 21, 1971, the President pointed out that increased security assistance "enables us to continue to reduce our direct presence abroad, and helps to reduce the likelihood of direct U.S. military involvement in the future."

In that same address, the President underlined the importance he attaches to foreign aid as a tool of his foreign policy for the 1970's. He announced his decision to reform the U.S. aid effort, beginning with creation of separate structures for security-related, development, and humanitarian assistance. The various ongoing assistance efforts which serve U.S. security interests were thus combined into one coherent program. The elements of that program are the following:

-- Military Assistance Program (MAP) - grants of military weapons and other equipment, as well as of military training.

-- Foreign Military Sales (FMS) Credit - government-to-government or commercial sales of defense material financed by U.S. government or by government-guaranteed credit.

-- Security Supporting Assistance - aid intended to offset, in part, the impact of exceptional defense costs of the recipient country on its civilian economy.

-- Non-funded Security Assistance - Grant Excess
- Grant Excess Transfers - material declared excess to U.S. force requirements.

- Equipment Loans and Leases - primarily ship leases.

- FMS Cash and Commercial Military Sales

a. Security Assistance Organization, Reform and Planning

During the past year, a number of steps have been taken in the Executive Branch to make the planning and administration of security assistance more effective.

In reshaping the foreign aid program, the President directed that the planning of all security-related aid program elements be integrated. Accordingly, although MAP and FMS programs were administered in the Defense Department, while economic supporting assistance was administered by AID, during the period in which the FY 1973 security assistance budget was being constructed and subjected to the President's final review, security assistance was treated as an integrated whole.

Within the Department of Defense, I have initiated several innovations to improve integration of security assistance in the overall U.S. security effort. For the first time, planning for FY 1973 military assistance and credit sales took place within the Department of Defense Planning, Programming and Budgeting System (PPBS). The results of the initial effort were gratifying to me because of the long-term prospects for more efficient security resource allocations within the Total Force Concept.

A second important step was creation of the Defense Security Assistance Council, and the Defense Security Assistance Agency, which are discussed in the Organization and Management chapter.

I would note that security assistance planning continues to be an interagency effort within the Executive Branch. This procedure insures that the Department of State is able to exercise its statutory responsibilities for policy guidance of security assistance while the Department of Defense will continue to manage the military program, thus permitting more effective use of all defense resources.

b. Progress in Total Force Planning and Security Assistance.

1. Combined and Complementary Force Planning and Security Assistance

Vietnamization has had a major impact on the size of U.S. forces, as it has permitted step-by-step transfer of responsibility for combat operations to South Vietnamese forces without diminution in security and without undue burden on the stability of the Vietnamese economy. Similarly, joint development and implementation of a U.S.-Republic of Korea five-year security assistance modernization for their forces program has permitted withdrawal of one U.S. division from Korea in FY 1971.

I would emphasize that substantial security aid to South Vietnam must be maintained to continue this progress. Our security assistance to the peoples of Laos, Thailand and Cambodia in their struggle to maintain their independence has likewise been essential, and it will continue to be so for some time. Unlike other country programs, most security assistance to South Vietnam, Laos, and Thailand has been provided for several years through the Defense budget. The Thailand program is being returned entirely to regular International Security Assistance funding for FY 1973.

In South Korea, national forces are assuming increased responsibility for their own defense. The ROK Government must maintain large defense forces to meet the threat posed by well-equipped forces in the North. Consequently, it must support a heavy burden on its national economy, and simultaneously undertake increased production in country of defense equipment, aided in part by MAP and FMS credit. Thus, South Korea may continue for some time to be dependent on the United States for support of its defense efforts. Nonetheless, greater Korean self-sufficiency in defense is signaled by that government's recent agreement to assume responsibility for procurement of operating material formerly supplied under MAP as well as inauguration of an FMS credit program to finance development of M-16 rifle and ammunition production facilities in-country.

A significant feature of the five-year program to advance Korean force modernization is our plan to provide the new International Fighter Aircraft, the F-5E. This aircraft has been developed specifically to meet the need of allied and friendly air forces for an effective and flexible, yet relatively simple and inexpensive new fighter aircraft. Congress had a strong role in initiating this program.

U. S. security assistance to our NATO allies, except for Turkey, Greece and Portugal is limited almost exclusively to military export cash sales. Credit assistance is no longer required in most instances, and military sales to Europe represent an economic gain rather than a drain to the U.S. However, three allies, Turkey, Greece and Portugal continue to require outside grant and credit security assistance to permit them to improve their capabilities for fulfilling their assigned roles in NATO defense plans. Indeed, their importance to U. S. and NATO security interests have increased significantly in recent years as a result of the Soviet military buildup in the Mediterranean and the volatile situation in the Middle East. Both Greece and Turkey have demonstrated their dedication to NATO defense by major manpower and resource commitments to the Alliance. It is in the U. S. interest, therefore, to assist these willing allies to make a more effective contribution to NATO defense by helping them acquire more modern defense equipment and improved training. In the case of Greece, economic growth now permits U.S. assistance, for the most part, to take the form of FMS credit for arms purchases rather than outright grants.

2. Supplementary Planning and Security Assistance

Security assistance can also advance U.S. security in ways less directly related to specific force trade-offs under total force planning. As we work cooperatively with the military officers who play such an important role in many Latin American countries, our missions and assistance programs further our interests while responding positively to those of the Latin Americans. Latin American nations are our partners, not our dependents. We seek only to assist -- partly through the several, less explicitly military aspects of our security assistance programs such as training aids -- in preserving the environment within which social and economic progress can occur.

Among our hemisphere neighbors and elsewhere, selectively, throughout the world the United States seeks to utilize judiciously its diplomatic, economic and military resources to help avert war. We must strike a balance and take care, for example, that our security assistance does not contribute to hostility between neighboring states and forces. We provide security assistance on a case-by-case basis to assist friendly countries to combat insurgency and help defeat externally inspired subversion and maintain the kind of military balance which will deter external attack. In supplying security assistance, and in the licensing of military exports through commercial sale, we seek to emphasize regional arrangements that enhance stability. We must recognize, however, that every nation has the right to be prepared to defend itself against internal and external threats and that most nations do not themselves produce the equipment for their own defense that they may need. We must also be cognizant of the fact that today, as never before, foreign countries have alternatives to acquisition of defense equipment from the U.S. -- particularly if some form of purchase is involved. Nonetheless, we shall continue to review most carefully potential sales of military equipment, even to close allies, and to refuse them where regional security or other U.S. interests would be adversely affected.

c. Security Assistance Legislation

For FY 1972 the President proposed to the Congress that it enact sweeping new foreign aid legislation authorizing and funding security assistance separately from development and humanitarian aid. The Congress elected to defer consideration of this approach and instead to appropriate funds under existing legislation. Nevertheless, by the end of the 1971 session I believe that the benefits associated with combining all elements of security assistance into a cohesive program separate from development and humanitarian programs was appreciated by a majority of the Congress.

d. Summary

I believe that presentation of security assistance budget requests in the context of the overall U.S. national security program will permit easier understanding of the linkage between the U. S. force posture and overseas deployments, on the one hand, and adequate security assistance to allied forces, on the other.

It is important that the Congress recognize and understand the important role that grant military assistance and other forms of U. S. security assistance have played over the past two and a half decades in countering threats to non-Communist countries. For while the burdens in blood and dollars which the American people have borne to help defend others have been great, they would in my judgment have been far greater without security assistance. During the past few years, I believe that we have made major progress, through security assistance, in strengthening the capabilities of Free World nations to defend themselves, thereby helping move toward a more equitable sharing of the defense burden.

PLANS FOR PEOPLE

As we look to the future, manpower—our most precious asset—will take on new significance. It will be our responsibility, working with Congress, to complete a revised personnel program that will have the approval and support of the American people.

PERSONNEL REDUCTIONS

In the 5 years from June 1968 to June 1973, nearly 2.8 million military and civilian Defense personnel will have been released to non-defense pursuits.

We have now reached a "baseline" force, appropriate to fulfill essentiall peacetime security requirements. The less than 2.4 million military personnel remaining are: 1,068,000 fewer than the peak 1969 Vietnam buildup; 296,000 fewer than the 1964 total prior to the buildup; 1,028,000 fewer than after the Korean war, in 1954.

PAY INCREASES

The winding down of the war has meant substantial monetary savings. Where has that money gone? Much of it has been reallocated in our Defense budget from warfighting to people. For too long our military men and women were underpaid; some have been forced to live on welfare. The failure to pay adequate salaries to military people—particularly those in the lower ranks—represented discriminatory taxation on them and their families. We have substantially changed that grossly unjust treatment of those who wear the uniform of their country.

Congress has given leadership in this program which has been most helpful in correcting this injustice.

We are also moving to redress pay inequities to persons on the retired list.

ALL-VOLUNTEER FORCE: ADDITIONAL BENEFIT REQUISITE

The new approach to military compensation will make it possible for us to move away from heavy reliance on the draft and toward zero draft calls and an all-volunteer force. We also need to improve housing and educational benefits, but most of all we need to insure that military people and their families receive recognition and appreciation from the American people for their devoted service to our country.

PERSONNEL REDUCTION

Senator CASE. In reference to figure of 2.4 million for personnel on page 19, Mr. Secretary, are these individuals who have left the service in this period?

Secretary LAIRD. No; that includes civil service employees and defense-related employment in industry, too. This is the total number of defense jobs reduced.

Senator CASE. In other words, this is the number of slots that are not there any more? This has nothing to do with individuals?

Secretary LAIRD. This number is the reduction in defense-related employees in industry, in civil service employees and in military personnel between fiscal 1968 and 1973. This is the total number. This relates somewhat to the unemployment problem which we have as a result of the change from war to peace and from a wartime economy to a peacetime economy.

MILITARY RETIRED PAY AND RETENTIONS LEGISLATIVE PROPOSALS

Senator ALLOTT. Mr. Chairman?

What is being done with respect to the retired pay of our military people?

Secretary LAIRD. We have several studies going on. In the President's budget document he indicated that there would be submitted this year plans for a modernized retirement system with improved survivor benefits, greater incentives for the retention of experienced personnel, and an equitable adjustment of pay for those already retired.

Now, in connection with that, we are planning to send up a piece of legislation dealing with those people already retired. It is a recomputation legislation, and that also is included in the President's budget as far as increased personnel cost associated with the recomputation is concerned. I expect that legislation on recomputation will be submitted in the very near future.

BUDGET REQUESTS

In addition to that, there is money in the budget to cover benefits which the President committed himself to for the so-called Allott amendment. That funding in the amount of $360 million is also included in the budget and in the personnel area another amount of $804 million is included for pay increases that will go into effect on January 1, of 1973 in accordance with the actions already taken by the Congress. Those are all the things that are included in the budget message.

STATUTORY RETIREMENT PROVISIONS FOR REGULAR FORCE AND RESERVE PERSONNEL

Senator ALLOTT. One other question, and I realize I am treading on ice here, but as I understand it, the retirement situation is this at the present time: If an officer of a certain grade, we will say lieutenant colonel, retires at the end of 20 years, which he can do, it is at a reduced rate as compared with that if he continued, isn't it?

Secretary LAIRD. Yes; the amount is 50 percent of his base pay if he leaves at the end of 20 years.

Senator ALLOTT. A lieutenant colonel in the Reserves who has had, say, a minimum of 3 or 4 years active service, but who has attended his training, retires at the end of 20 years and he receives the same amount, does he not?

Secretary LAIRD. I will put a comparison in the record that shows the difference.

(The information follows:)

Comparison of Retired Pay Entitlement

- Active Duty versus Reserve -

Case 1

An O-5 Regular or Reserve officer retired after 20 years on active duty would be entitled to 2.5% times 20 years times the basic pay to which he was entitled at the time of retirement. Based on the January 1, 1972 pay rates retired pay would be:

2.5% x 20 x 1523.70 or $761.85 monthly

Case 2

An O-5 Reserve officer retired after 20 years of "satisfactory Federal service" of which 6 years was active duty. In each of the remaining 14 years he served 14 days on active duty and during the remaining 50 weeks he earned a total of 35 points. Such an officer would be entitled to retired pay at age 60 computed as follows:

6 yrs x 365 (days of active duty) =	2190 points
14 x [15 points (for Reserve membership) + 35 points earned + 14 points for active duty] or	
14 x 64 =	896 points
Total points	3086

Coverting "points" to equivalent of active duty:
3086 ÷ 360 = 8.57 years

Retired pay is then computed in the same manner as under the active system:

2.5% x 8.57 years x 1523.70 = $326.45 monthly

RETIREMENT OF RESERVISTS ON INACTIVE DUTY: PENDING CONSIDERATION TO BE FOLLOWED BY RECOMMENDATION

Senator ALLOTT. Let me ask this question. I have had the feeling—and I know this is true for many of the individuals—that they have gone on and attended the Reserve sessions once every week just so at the end of the 20 years, whenever they reach the proper age, they can draw the retirement. Shouldn't the retirement be based on actual active service and the time spent rather than just on a flat remuneration?

Secretary LAIRD. We have some recommendations which have gone through an interagency committee and which are now being considered. We will have recommendations in this area.

We have not come down on the kind of legislation that will be submitted to the Congress in this area. We are ready to move forward on recomputation legislation. We have that program worked out, but we have not made a decision on the question which you raised. We are studying that question at the present time.

There will be some changes recommended. I will see that you are notified immediately, Senator, but we have not come down with that proposition as yet.

Senator ALLOTT. I would be interested in that.

Secretary LAIRD. We are trying to get our pay legislation ready now.

POSSIBLE RETENTION INCENTIVES

I personally feel we should look at that again and perhaps consider some incentives for the Reserve and National Guard as we move toward the expiration of the current draft law because that is one of the areas where we need additional incentives.

We have around 49,000 vacant slots in the Reserve and National Guard as of the end of January. Many of the people that went into our Reserve and National Guard—I am sure there was incentive there through the selective service that encouraged them to go in.

With draft calls reduced from almost 300,000 in 1968 to around 160,000 in 1970 and less than 100,000 in 1971, and now we are reducing them still further this year, we are going to face a problem. I think there should be enlistment bonuses authorized in that particular area, and I am hopeful that our people can talk with you and with your staff to encourage certain changes. I would like to put in a short statement on this subject for the record at this point, because I think it is important.

(The statement follows:)

As I indicated in my statement, we are concerned with early indications of shortfalls in the strength of the Selected Reserves of the Guard and Reserve Components. We recognize that our capability to meet manpower strength requirements is a direct measure of our capability to support the Total Force Concept. For this reason, the months of January, February and March of this year have particular significance for the Guard and Reserve.

During this period, the Reserve Components are, in effect operating in a zero draft environment. We are having an earlier than expected opportunity to test the effectiveness of the first incentive we had programmed for introduction into the National Guard and Reserve Forces—that is, the impact of the pay changes which took effect in November and the general pay raise of January. The three-month period of no-draft following expiration of the Selective Service authority at the end of June last year and the three months of very low draft

calls thereafter were reflected by a net loss in Selective Reserve strengths of some 45,000 by the end of December. Although the rate of loss began to level out somewhat in December, we do not yet have enough experience to judge the impact of the pay raises on recruiting and retention of National Guard and Reserve personnel.

Meanwhile, we have mounted an intensive recruiting and retention effort. We are watching the results of this effort closely, and around the beginning of April we should be in a position to decide on the most appropriate actions to meet our Guard/Reserve manpower requirements.

If by that time, we determine that the downward trend in strengths is not abated by initiatives now being employed, we will be in a position to institute reprogramming actions and request authority and funding for other incentives.

Senator ALLOTT. I am always willing to listen to suggestions, but I feel that if a Reserve is paid what a Reserve should be, it has a fair remunerative basis. But when many of the Reserve programs are so lacking in stimulation that they cannot even keep the people that they have in them, then I cannot see that they should be treated essentially on the same basis as a retired regular officer of the same grade.

If they are meaningfully employed, if they are provided vital programs; yes. If they are not, I am opposed to them.

PRIOR POLICY TURNAROUND: GREATER RELIANCE ON RESERVE COMPONENTS

Secretary LAIRD. We are trying to change the emphasis in these programs. During the period of the 1960's the decision was made that selective service would be used and not the Reserve and National Guard. That kind of announcement was made and that kind of philosophy adhered to all during Vietnam. The emphasis that was needed and necessary to make these programs meaningful was just sort of lacking in the whole program.

The Reserve and National Guard became stepchildren with the Regular Forces. We are changing that, and I think we have made some good progress. We have to make further progress in that area, but I agree with your comments regarding the programs in the past. We are trying to change that philosophy now. With your permission, Mr. Chairman, I will continue now with my prepared statement.

REAFFIRMATION OF HUMAN GOALS STATEMENT

We have recently reaffirmed the Human Goals Statement for men and women, military and civilian, throughout the Department of Defense. It is reproduced on the back cover of my Defense Report, and I would like to insert it in the record at this point.

(The statement follows:)

DEPARTMENT OF DEFENSE

HUMAN GOALS

Our nation was founded on the principle that the individual has infinite dignity and worth. The Department of Defense, which exists to keep the nation secure and at peace, must always be guided by this principle. In all that we do, we must show respect for the serviceman, the servicewoman and the civilian employee, recognizing their individual needs, aspirations, and capabilities.

The defense of the nation requires a well-trained force, military and civilian, regular and reserve. To provide such a force we must increase the attractiveness of a career in Defense so that the service person and the civilian employee will feel the highest pride in themselves and their work, in the uniform and the military profession.

THE ATTAINMENT OF THESE GOALS REQUIRES THAT WE STRIVE ...

To attract to the defense service people with ability, dedication, and capacity for growth;

To provide opportunity for every one, military and civilian, to rise to as high a level of responsibility as his talent and diligence will take him;

To make military and civilian service in the Department of Defense a model of equal opportunity for all regardless of race or creed or national origin, and to hold those who do business with the Department to full compliance with the policy of equal employment opportunity;

To help each serviceman at the end of his service in his adjustment to civilian life; and

To contribute to the improvement of our society, including its disadvantaged members, by greater utilization of our human and physical resources while maintaining full effectiveness in the performance of our primary mission.

ORIGINAL ISSUE DATE:
August 15, 1969

EQUALITY OF OPPORTUNITY AND DRUG CONTROL

Secretary LAIRD. I am determined that the Department of Defense maintain its leadership role and make further progress in meeting two of our society's most difficult problems; equality of opportunity and drug control.

RETURN OF PHYSICIANS, DENTISTS AND MEDICAL PERSONNEL TO CIVILIAN LIFE AND NONDECREASE MEDICAL CARE QUALITY

As a further contribution to the efforts of the Defense Department to improve the quality of life, we are working on plans that will make it possible, in the next fiscal year, to return some thousands of physicians, dentists and other medical personnel to civilian communities. At the same time, we are determined that there will be no decrease in the high-quality medical care provided our military people, their families and those on the retired lists.

MILITARY ASSISTANCE TO SAFETY IN TRAFFIC

Project MAST (Military Assistance to Safety in Traffic) will also be expanded this year. This program supplies military helicopters, many from Vietnam, to assist local communities in providing rapid care to accident victims.

Just yesterday, we saved the life of a young girl in Phoenix, Ariz., in this project. I think if I put in a short accident report of that incident it would show you the kinds of things that we are doing in the program.

(The report follows:)

MAST MISSION SAVES GIRL IN ARIZONA

Last night, February 23, Detachment 15 of the 42nd Aerospace Rescue and Recovery Squadron, Luke Air Force Base, Arizona, successfully evacuated a seven-year-old girl from Blue, Arizona, to Phoenix, Arizona, following an automobile accident.

The child was riding in the family car near Blue (near the New Mexico border) when the car was caught in a rock slide. A large boulder came through the rear window of the car and fractured the child's skull.

The State Highway Department requested assistance and an HH–43 of the 42d ARRS was launched. Blue, Arizona, is beyond the normal 100-mile MAST operating radius, but the helicopter landed enroute at Globe, Arizona, to take on fuel from pre-placed reserves and then went on to the site of the accident. Although there was some difficulty locating the site, the pickup was made when the Highway Patrol lighted the accident scene.

It soon became apparent that on-board fuel would be insufficient for the entire return trip and a decision was made for the helicopter to proceed to the first visible town. A low-fuel warning light appeared when the helicopter was about five miles from Safford, Arizona. A second HH–43 had been launched, picked up the child at Safford, and took her on to St. Joseph's Hospital in Phoenix. Her condition has stabilized and neurologists at the hospital state that time was the primary factor in saving her life.

Child's name is Stormy Luce. We do not yet have parents' names or those of crew members. Other occupants of the car apparently were uninjured.

Secretary LAIRD. It is making our defense dollar do double duty where it can, near these military installations. It gives us an opportunity to use these military facilities and make the defense dollar do double duty wherever we possibly can in protecting and saving

human lives. This program has worked out very well in these communities near and close to military facilities.

Chairman ELLENDER. Is this program operated by the military departments?

Secretary LAIRD. Yes.

DISPOSITION OF EQUIPMENT SENT TO SOUTH VIETNAM

Senator YOUNG. Mr. Chairman?

Earlier you mentioned that about a billion dollars worth of equipment would be going to the National Guard and to the Reserves.

Secretary LAIRD. That is correct.

Senator YOUNG. You mentioned that much of this is coming from Vietnam.

Secretary LAIRD. That is correct.

Senator YOUNG. I thought we were turning over most of the planes and helicopters to the South Vietnamese.

Secretary LAIRD. We are turning over a great many. The South Vietnamese will have the fourth largest helicopter force of any nation in the free world. But we are not turning over the helicopters of our units that will remain in the force structure after they are redeployed to the United States. We are now continuing to turn over helicopters to the South Vietnamese. In some cases we are bringing our helicopters, our artillery and our equipment, back to the United States, but in others, we are turning them over to the South Vietnamese. We believe that it is absolutely essential that we do this.

It is a long process we go through. The Department of Agriculture, as you know, Senator Young, requires us to go through a cleansing process which is a most difficult cleansing process. Those people that talk about rapid withdrawal should see the way we have to wash down every truck, every aircraft, every piece of equipment. It is a tremendous job of cleansing we go through.

But we are bringing billions of dollars worth of equipment out of Vietnam.

Senator YOUNG. Is part of that equipment new equipment scheduled for Vietnam and not sent there?

Secretary LAIRD. No, this equipment was assigned to the American Forces in Vietnam.

Senator YOUNG. And brought back from Vietnam? You are bringing back $1 billion dollars worth of equipment?

Secretary LAIRD. When the Marines left Vietnam, they took all their serviceable equipment with them.

Senator YOUNG. I thought they kept it.

Secretary LAIRD. The Marines kept their own equipment and brought it back and it is with their divisions now

U.S. MODERNIZATION OF KOREAN FORCES AND WITHDRAWAL OF U.S. TROOPS

Chairman ELLENDER. Mr. Secretary, how are you satisfying the South Koreans insofar as it relates to the promise we made of improving their forces?

Secretary LAIRD. We are using excess equipment in Vietnam. Some of the equipment we are using in this area is not in the Vietnamization

program and it is excess to U.S. requirements. We do use some excess equipment in the modernization program in Korea.

Chairman ELLENDER. Is that new equipment or has it been in use?

Secretary LAIRD. It is equipment that has already been in use—the excess equipment going to Korea.

Chairman ELLENDER. As I understand it, we promised over the next 5 years to better equip the Koreans and in return we were to withdraw 20,000 of our own soldiers.

Secretary LAIRD. It was not tied up that way necessarily, Mr. Chairman. What we are trying to do is to modernize their forces so there will not be a requirement for us to keep all our forces there and so we can bring our forces out of Korea any time we want to.

Chairman ELLENDER. It is worth trying.

Secretary LAIRD. We can. That is a decision made by the U.S. Government. It is not tied up with any sort of arrangement on the modernization program.

Chairman ELLENDER. Because I have been advocating that ever since Secretary McNamara was in office. He agreed with me, but——

Secretary LAIRD. My friend, Secretary McNamara, was unable to remove a single soldier from Korea. In the last 2 years we reduced our authorized strength in Korea by 20,000.

Chairman ELLENDER. But in order to be able to move our troops out, you have to make promises to the South Koreans.

Secretary LAIRD. I made it clear in my discussions with the Defense Minister and with the Korean Government that the stationing of American Forces was under the control of our Commander in Chief, the President of the United States, and it is not tied up with any kind of agreement to modernize their forces. It is in our interest to modernize their forces, but it should never be stated at any time that our Commander in Chief or that our Congress approves the stationing of an American, military force on that kind of a basis, because that just should not be tolerated.

I am for modernizing the Korean forces, but the modernization of the Korean forces is not tied to stationing a certain number of Americans in Korea and we should not get it tied in that context. Rather, it is tied to implementing the Nixon doctrine and the whole total force concept with our allies.

Chairman ELLENDER. You would have a lot of explaining to do.

Secretary LAIRD. Mr. Chairman, I impressed upon the President of Korea as well as the Defense Minister that the 5-year modernization program would be approved a year at a time by this Congress. There was no 5-year commitment as far as the U.S. Congress was concerned, and it was and is subject to congressional approval. I recognized that the Congress is a co-equal branch of Government. Although the 5-year modernization program will enable the Koreans to fill the gap in military capability following U.S. troop withdrawal. I do not want it said that we have made a 5-year commitment because a 5-year commitment has not been approved by Congress.

KOREAN FORCE CAPABILITY

Senator PASTORE. Will they ever be able to be self-sufficient in their own defense?

Secretary LAIRD. They are certainly going to be able to defend themselves of the ground. They already have a ground force numeri-

cally superior ground force to that of the North Koreans at the present time. Now, the 5-year Korean modernization program is a very important program in giving the Koreans the things they need if the Nixon doctrine is going to work in Asia. I would like to insert some material in the record on Korea and the Nixon doctrine.

(The information follows:)

Our relations with the Republic of Korea provide an excellent example of the Nixon Doctrine at work as I saw on my visit there last year. As 1970 closed, the Republic of Korea continued to face across the demilitarized zone as a hostile North Korean regime. Considerable effort was required during 1971 to prevent incursions of saboteurs and agents from North Korea and to apprehend those personnel who succeeded in entering the country, and this type of activity continues. North Korea continues to maintain the fourth largest Army in the communist world and to improve her military posture. It was in this environment that we and the Republic of Korea moved forward in 1971 to implement the Nixon Doctrine and our new strategy. These have been the achievements:

U.S. troops no longer man any significant portion of the DMZ where they had been stationed since the cessation of hostilities in 1953.

ROK troops now have assumed responsibility for the security of the line dividing the two halves of Korea, with the exception of the very small portion devoted to the Military Armistice talks.

Authorized U.S. troop strength was reduced over the last year from some 60,000 men to the present strength of about 40,000.

A Five Year Modernization Program for the Republic of Korea Armed Forces has been instituted which, with Congressional sanction and support, will enable the Koreans to maintain an adequate defense posture. In addition, the ROK is taking steps to increase its own self-sufficiency by providing, through its own defense budget, items previously supplied by the U.S. which can be readily procured in Korea.

Implementation of the Korean Five Year Modernization Plan will be closely observed by both our allies and the Communist nations in Asia as an indication of U.S. determination to live up to the Nixon Doctrine and to continue to play a key role in Asian affairs. The North Koreans have recently adopted a stance of some reasonableness in public statements regarding the future of the peninsula in an effort to improve their international image and to adapt to the changing situation in Asia. However, it would be imprudent to presume that the North Korean objective of unifying the peninsula under Communist domination has changed. The South Korean Government must be able to cope with the new Kim Il Sung "peace offensive" from a position of strength; thus the modernization program is important, not only as a deterrent against possible North Korean adventurism, but in providing a sense of confidence and security to the Korean Government and people as they too seek to adjust to the changing international situation. Further, the modernization program as it contributes to guaranteeing the future stability of the peninsula is important in an economic as well as a political and military way; as, only with such stability, will U.S. and third country businessmen continue to invest substantial funds to assure continued rapid economic growth in South Korea.

KOREAN AIR FORCE

Secretary LAIRD. The Korean air force—it will take several years before that Air Force——

Senator PASTORE. How many airmen do we have there now?

Secretary LAIRD. We have three F–4 squadrons plus related communications, supply and support activities. We have about 9,000 Air Force people there today.

Senator PASTORE. That is not saying how long they are going to be there.

Secretary LAIRD. In this particular budget, we do not anticipate a further reduction in our forces.

Senator PASTORE. I don't mean it that way. I am not talking about money. I am talking about involvement.

Secretary LAIRD. We have made a 20,000 reduction, and we will be making further reductions, but we do not anticipate a further reduction in fiscal 1973.

UNENDING U.S. INVOLVEMENTS IN DEFENSE OF OTHER NATIONS

Senator PASTORE. One thing that alarms me, Mr. Laird, is the duration of our stay in many of these areas. I realize we have reduced the number of American military personnel in some places. But the fact still remains that I don't think we have seen the other side of the tunnel yet and won't see it for a long time if we continue the course we are pursuing. That frightens me, because I begin to wonder, with all of the responsibilities we have here at home—and I am not talking now about our military requirements—how much we can become involved in policing and defending other people all over the world.

I had occasion to listen to the George Washington Farewell Address—I don't know if you gentleman are familiar with it—and I think we have done everything just the opposite to the advice given in it.

KOREAN TROOPS IN SOUTH VIETNAM

Senator YOUNG. How many troops do the Koreans have left in South Vietnam and what is their withdrawal schedule?

Secretary LAIRD. They have two divisions presently stationed in South Vietnam.

Senator YOUNG. About how many is that?

Secretary LAIRD. The total force involved is around [deleted] I think, at the present time, but let me just check that out.

Senator YOUNG. Are they going to be kept there for awhile, any appreciable period?

Secretary LAIRD. Of course, this is a matter that is negotiated between the Koreans and the South Vietnamese Government. [Deleted.]

Senator YOUNG. Aren't the Korean forces in South Vietnam used to any extent to defend our bases or are they defending South Vietnamese bases?

Secretary LAIRD. They have responsibility for military security in a given region of South Vietnam. They are not defending our bases. As a matter of fact, we give them logistic support. The Korean forces in South Vietnam total about [deleted].

Senator YOUNG. They have [deleted] left?

Secretary LAIRD. They have taken off the marines.

Chairman ELLENDER. [Deleted] thousand South Koreans in South Vietnam?

Secretary LAIRD. They have a few thousand more presently in Vietnam than we have in Korea.

Chairman ELLENDER. You say we are paying for the logistics?

U.S. PROVISION OF LOGISTIC SUPPORT

Secretary LAIRD. We give them logistic support under arrangements made by Clark Clifford and Max Taylor, who negotiated the arrangement for President Johnson.

Chairman ELLENDER. In regard to their removal, why should they consult with the South Vietnamese, if we are paying the cost?

Secretary LAIRD. They are there at the request of the South Vietnamese Government, decided on in negotiations that go on between South Vietnam and Korea. The question of giving them logistic support was a matter that was entered into as a separate arrangement after they had been requested to come to the country.

Chairman ELLENDER. Are we to understand that the transactions that were paying for logistics for the South Koreans are paid through the South Vietnamese Government and not directly by us?

Secretary LAIRD. No, it is not paid that way. Under the arrangements that were made by General Taylor and Clark Clifford for the President, the South Vietnamese Government requested the Koreans to come in and at that particular time President Johnson, after consulting the proper committees of the Congress, told the South Vietnamese Government that if they did come the United States would give them logistic support.

Chairman ELLENDER. And you are carrying that understanding out now?

Secretary LAIRD. We are carrying that agreement out now.

ITEMS COVERED UNDER LOGISTIC SUPPORT

Chairman ELLENDER. What do you mean by logistic support? Does that extend to the pay of the men who are in combat?

Secretary LAIRD. No; it does not extend to the pay, but it extends to subsistence. It covers ammunition, it covers airlift and those particular items.

Chairman ELLENDER. I thought you were doing it through the South Vietnamese Government.

Secretary LAIRD. No, we are not doing that. That is not part of the Clark Clifford-General Taylor arrangement negotiated for President Johnson.

Senator PASTORE. Can't they use military assistance money for that? They must be using that. It is our money.

Secretary LAIRD. We don't pay Korean soldiers directly. We give the Korean Government the money with which they pay their forces an oversesas allowance.

Senator PASTORE. We know that.

Secretary LAIRD. No MAP money can go for pay in Korea. The money going to Korea in the military assistance program does not go for pay. I suppose you could say it might free up some of their money by providing the investment items but there is a prohibition, as I understand it, against using it for pay.

Senator PASTORE. I agree with you, but you give the money from either the right pocket or the left pocket—it is the same money.

Secretary LAIRD. Off the record.

(Discussion off the record.)

FREE WORLD SUPPORT FORCE TABLE

Secretary LAIRD. We give you the free world support force table. We notified you each year I have been Secretary of Defense. You have it and it is in your records.

PAYMENT TO PHILIPPINE FORCES IN SOUTH VIETNAM

Chairman ELLENDER. How were the Filipinos paid?
Secretary LAIRD. The same way.
Chairman ELLENDER. By the South Vietnamese?
Secretary LAIRD. Let us keep this off the record.
(Discussion off the record.)
Chairman ELLENDER. On the record.

MEDICAL RESEARCH: SICKLE CELL ANEMIA

Secretary LAIRD. Continuing with my prepared statement we will continue our strong emphasis on medical research which can help improve the quality of life for all Americans. For example, we are initiating new research programs to assist in the President's program of combating sickle cell anemia. I discussed the subject of sickle cell anemia this morning with Senator Case.

ALL-VOLUNTEER FORCE: RECRUITING AND RETENTION

Finally, as we approach an all-volunteer force, we will continually assess our recruiting and retention programs, and at some point we may wish to consider whether there would be advantages in establishing a joint Defense recruiting service. Our zero draft goal coincides with the end of the fiscal year to which this report addresses itself—July 1, 1973.

MANAGING THE DEPARTMENT OF DEFENSE

At this point, Mr. Chairman, I would like to include in the record the chapter of my Defense report that provides a detailed discussion of our manpower objectives. I also believe it would be helpful for you to have a copy of my report on manpower requirements. This is the most comprehensive report on manpower that has ever been presented, in my opinion, and I think you should have that report.
(The excerpt follows:)

II. DEPARTMENT OF DEFENSE MANPOWER OBJECTIVES

A. MAJOR MANPOWER GOALS

The major Department of Defense goals in manpower policy remain the same as those I reported to you last year. They are:

-- Reduction of draft calls to zero by July 1, 1973, and achievement of an all-volunteer force.

-- Improvement of the quality of life in the military services to continue toward the objectives expressed in the 1969 statement of our Human Goals.

-- Completion of the transition to peacetime manpower levels with minimum hardship to individuals, while simultaneously maintaining and upgrading the quality of the force.

These goals relate to our manpower policy. There is, however, one fundamental objective which guides all of our manpower planning:

> To provide the required personnel to man and operate our military forces, thus providing us with essential capabilities for national security.

This year I would like to discuss with you the broad rationale for our manpower requirements -- why, in gross terms, we need the personnel strengths that we are recommending -- and some of the trends regarding personnel strengths over the past years -- with hopes of giving you a better understanding of our current manpower situation.

B. MANPOWER REQUIREMENTS

The manpower strengths which we are recommending, together with those for previous years, are shown in the two-part table on the following page. The top part shows a summary without general support personnel allocated, and the second part shows this support allocated to our major mission categories. I will discuss the general support category in more detail in subsequent pages.

As you can see, personnel requirements for strategic forces represent a small portion of our overall manpower requirements, about 10% even with support allocated. These people man the strategic offensive and defensive forces necessary to provide adequate capability to fulfill the requirements of strategic sufficiency. They are highly trained, and in many cases require specialized skills.

All of these improvements together will not accomplish the full level of improvements we seek in improving the weapons systems acquisition process. We need to do more and will continue to search for appropriate new techniques to accomplish our aims. For instance, we are not yet convinced that we have established the proper incentives for the elimination of marginal requirements that needlessly increase acquisition -- and operating -- costs with little performance benefits. We are not convinced we have established sufficient competitive incentives toward economy and simplicity in design and operation. There

will probably never be a "final report" on reaching perfection in Weapon Systems Acquisition. However, this Administration intends to continue to provide substantive "progress reports" indicating our efforts in this direction. We are hopeful that the Congress will continue to help us, as they have done in the past, in this difficult task.

Active Military Manpower Summary
(Manpower End-Strengths in Thousands)

Without General Support Allocated

	FY 70	FY 71	FY 72	FY 73
Strategic Forces	143	130	130	127
Offense	(90)	(88)	(88)	(89)
Defense	(38)	(27)	(26)	(24)
Command and Control	(15)	(14)	(15)	(14)
General Purpose Forces	1251	1082	949	935
Land Forces	(746)	(638)	(513)	(516)
Tactical Air Forces	(188)	(167)	(166)	(167)
Naval Forces	(232)	(205)	(206)	(195)
Mobility Forces	(85)	(72)	(64)	(57)
Other Mission	214	204	181	180
Intelligence	(93)	(91)	(75)	(68)
Communications	(59)	(55)	(52)	(50)
Research and Development	(39)	(37)	(37)	(35)
Support to Other Nations	(23)	(21)	(17)	(27)
General Support	1457	1298	1132	1116
Base & Individual Support	(657)	(580)	(513)	(506)
Training	(617)	(550)	(460)	(458)
Command	(154)	(138)	(129)	(121)
Logistics	(29)	(30)	(30)	(31)
Total	3065	2713	2391	2358

With General Support Allocated to Major Missions

Strategic Forces	273	249	245	240
Offense	(172)	(168)	(166)	(166)
Defense	(73)	(53)	(52)	(49)
Command and Control	(28)	(28)	(27)	(25)
General Purpose Forces	2384	2075	1803	1775
Land Forces	(1427)	(1223)	(975)	(980)
Tactical Air Forces	(356)	(319)	(317)	(317)
Naval Forces	(440)	(396)	(389)	(370)
Mobility Forces	(161)	(138)	(122)	(108)
Other Mission	408	391	345	344
Intelligence	(178)	(176)	(146)	(133)
Communications	(114)	(104)	(98)	(95)
Research and Development	(74)	(71)	(68)	(66)
Support to Other Nations	(42)	(40)	(33)	(50)
Total	3065	2713	2391	2358

NOTE: Numbers in parenthesis are additive; numbers may not add due to rounding.

Much of the support personnel allocated to strategic forces perform essential functions in our deterrent posture, such as manning strategic alert and satellite bases, and operating fleet ballistic missile submarine support facilities.

Our strategic force manpower requirements are dictated by the numbers of forces deployed. As you can see from the table, these have been reduced in the past three years. This reduction is due primarily to the phasing out of both B-52 and air defense aircraft, plus adjustments in headquarters and command and control structure.

Far more defense manpower (about 75% with support allocated) is assigned to missions associated with our general purpose forces. These land, naval, mobility and tactical air forces are maintained not only for defense of the United States but also for the support of other nations to which we are linked by common interests. The structure of these forces and their location around the world reflect two policy judgments which have been in effect for many years. These policies are: that the security of the US and protection of our vital interests require forces for forward deployment and forward defense; and that strategic nuclear forces, by themselves, are not a sufficient deterrent against the entire spectrum of aggression we must be prepared to face.

I noted in an earlier section the planning factors related to providing adequate capabilities to meet our basic military strategy requirements.

Strong and capable general purpose forces in peacetime have significant value in deterring war. Peace would be precarious, indeed, if the President of the United States had no option except the threat of a nuclear attack, when faced with a threat to our security or interests.

In addition, our general purpose forces actually deployed overseas in peacetime take on a significance beyond their purely military function, because they symbolize both to our allies and our enemies the commitment of the US to the area involved.

The basic size of our general purpose forces is significantly influenced by our commitment to NATO. The percentage of US forces necessary to fulfill our deterrent requirements for NATO reflects both an indication of our intentions toward Europe and a military capability of high credibility.

In simple terms our mission in Europe is, together with the forces of our allies, to deter, and to defend if conflict occurs. The political and military adequacy of our commitment is measured

by both our NATO allies and potential opponents. We believe that the general purpose force structure we are recommending will provide this adequacy.

The size and composition of our general purpose forces also reflects a requirement to provide substantial forces oriented toward our role as a Pacific power, and an effective mobile capability to deploy these forces in support of our interests. Here too our forward deployed forces serve an essential role -- a role increasingly oriented towards helping Asian friends and allies by complementing or supplementing their own efforts.

Let me now turn to a brief discussion of combatant support. The generally used ratio of combat to support personnel, usually derived from aggregate figures, has been erroneously interpreted as a sign that the military, particularly the Army, is losing its teeth and getting a big tail. In combat units, "teeth" can be partially measured by fire-power. A comparison of today's Infantry Brigade with its Korean War regimental counterpart using one measure of fire power potential shows that the brigade would use about 40% less manpower than the regiment to develop an equivalent amount of fire-power potential. Using the same type of fire-power measure as in the infantry example, the Division Artillery with a comparable number of men and weapons has increased its fire-power potential 600% over the past 20 years.

Even with the decrease in the combat to support ratio during the past two decades, the combat capability of our forces has improved markedly. And since weapons are now considerably more potent, it takes, in general, additional people to keep them in service. Sophisticated, accurate and powerful weaponry requires proportionately more support personnel -- not necessarily to operate, but to maintain equipment and train the users.

One effect of the changed ratio between combat and support troops is fewer casualties and less deaths resulting from casualties, as the table below shows:

Army Casualty Rates

	WWII	Korea	Vietnam
Battle Casualties*	30.6	22.7	19.8
Battle Deaths*	9.2	6.4	3.6

* Rates expressed as cases per 1,000 average Army strength per year

Let me now turn to a brief discussion of general support, and its components of base and individual support, training, command and logistics.

Currently there are 493 major bases in the United States and 302 overseas. The Department of Defense maintains a base structure to provide facilities for:

— operating forces in wartime (i.e., air bases, ports, etc.);

— keeping forces in peacetime (i.e., training areas, ranges, hangers, troop housing, etc.);

— supporting forces (arsenals, depots, shipyards, training centers, schools, etc.);

— providing services to personnel and dependents (family housing, commissaries, theaters, etc.).

We have undertaken a substantial number of activity reduction, realignment, and closure actions worldwide since January 1969. Excluding Southeast Asia, these actions eliminated more than 191,400 military and 137,000 civilian positions, and will reduce annual defense expenditures for the base structure more than $2.9 billion when completed. Most of the actions will be completed by the end of FY 1972, but a few will take longer.

To partially offset these reductions, we have increased certain elements of individual support since 1969, including actions taken to implement the all-volunteer force. For example, recruiting manpower has risen by 8,000 spaces, to the level of the 21,000 requested for FY 1973.

There are many different types of training, including the major basic categories of recruit, specialized, flight crew and unit, professional, and officer acquisition.

A substantial training base reduction occurred in FY 1972. Our plans in this area for FY 1973 provide for very few changes from last year. We cannot further reduce in this area until we are closer to an end to the draft and have been able to offset two-year inductions with volunteers having longer terms of service.

Command support provides manpower for headquarters and administrative staffs at and above the level of numbered Army, Air Force Air Division, Navy Ship Division, Navy Air Wing, and Fleet Marine Force.

In the past two years, we have reduced Command support by 12%. Eight thousand fewer spaces are proposed in the category in FY 1973 than in FY 1972.

Logistics support for supply and maintenance while essential, does not require large numbers of military personnel, since modern inventory management practices call for much automation, and much of our civilian manpower contributes to this task. In FY 1973 only

about 31,000 military men will conduct central supply and maintenance operations for DOD.

In summary, the military manpower requirements we are requesting provide for average active duty strength of 2,396,517 in FY 1973. The requirements and justification will be covered in more detail in other hearings. The almost 2.4 million military personnel we are requesting are:

-- 1,068,000 less than we had in 1969 at the peak of Vietnam buildup;

-- 296,000 less than we had in 1964 before the Vietnam buildup; and 2222

-- 1,028,000 less than we had in 1954 after the Korean War was over.

The last time we had an average active duty strength lower than this was before the Korean War, some 22 years ago.

In FY 1973, we are proposing minor adjustments in the manpower strength of our general purpose forces. As I reported to you last year, we have reached what we consider to be a "base line" force, appropriate to fulfill essential security requirements as we continue to shape the Nixon Doctrine peacetime deterrent force structure.

C. WHERE WE STAND

We have already made notable progress toward achievement of our basic manpower goals in a number of areas. This progress is measured by diminishing draft calls, increased incentives for voluntary military service, improvement in the life of the American serviceman, and large reductions in military and civilian manpower which have been cushioned by special efforts to alleviate personal hardship.

Since the beginning of the reductions in the size of the military and civilian force we have been plagued with the problems inherent in such a situation -- a constantly changing force structure, the involuntary release of personnel, and turbulence in job assignments -- all of which are obstacles to the maintenance of efficiency and combat readiness. Barring externally-directed changes in our planned manpower levels, fiscal year 1973 can be expected to be a year of leveling off, a period when these disruptive tendencies will become less pronounced. While some further reductions in both military and civilian personnel will occur, the rate of reduction will progressively slow down as we move toward our programmed base line force.

It would be a mistake to assume that all problems are behind us. No one can guarantee that the new incentives for an all-volunteer force will suffice to satisfy the need for manpower, without resort to the draft. Some obstacles, such as the possibility of difficulties in the completion of Vietnamization or the emergence of major unforeseen threats to our vital interests, are not fully within our power

to control. In short, the manpower reality which I discussed earlier in this report will remain with us.

Despite these problems, present and potential, I am confident that, with the support of the Congress and the American public, our goals are attainable and that we will move further toward their full realization in the coming year.

D. THE ZERO DRAFT AND THE ALL-VOLUNTEER FORCE

The immediate major manpower challenge is to reduce draft calls to zero and to create a force composed entirely of volunteers. President Nixon first presented this goal to the Congress in his message of April 23, 1970. In accordance with the President's desire that this goal be achieved as soon as it can be done without endangering our national security, I set July 1, 1973 as the target date for ending reliance on the draft. Meeting this target date will be no easy task, but the decline in draft calls from the Vietnam peak of 365,000 men in calendar year 1966 to the calendar year 1971 call of 98,000, the lowest since 1962, is an encouraging indicator. The following table shows draft calls for the last four years.

Calendar Year	Draft Calls
1968	299,000
1969	289,900
1970	163,500
1971	98,000

In CY 1972, which begins with no draft calls during the first three months, the figure will be substantially lower than in CY 1971. This prospect, when coupled with some recent improvement in enlistments and retention rates, could foster the belief that the all-volunteer force objective is within easy reach in the future. Such an optimistic judgment would be premature.

It is true that there were several signs of progress toward an All-Volunteer Force in the past year -- among them, these facts:

-- Seven of 10 enlistees were true volunteers, compared with a ratio of six of 10 a year ago, and five of 10 two years ago.

-- In the last six months of CY 1971, 25,000 more true volunteers enlisted than in the same period of 1970.

-- The mental skills of enlistees (sometimes called the quality mix), measured by the results of Armed Forces Qualification tests, were better in 1971 than in 1970. Also 12% more high school graduates enlisted than in 1970.

-- Combat arms enlistments in the Army increased from a monthly average of 250 in the last half of 1970 to approximately 3,000 in the last half of 1971 -- an increase of 1,200%.

-- In January 1972, almost 10,000 soldiers separating from active duty enlisted in Army Guard and Reserve units. This enlistment program for prior service personnel was tried in 1971 at two Army posts and expanded to twenty posts this year.

Encouraging as these facts are, these higher enlistment rates still fall short of those required for termination of the draft.

Low draft calls in the current fiscal year result largely from decreased Army manpower strength during FY 1972. With end-year strength goals substantially below beginning-year strength, the requirement for Army accessions has been greatly reduced and draft calls have consequently declined. About 140,000 soldiers must be released early during the period January-June 1972 to permit the Army to remain within the strength authorized by the Congress. For these reasons and others, we have not yet had a valid test of our ability to achieve and sustain zero draft calls. When a relatively stable manpower environment exists, it will then be much easier to judge the adequacy of pay raises and other actions designed to achieve an all-volunteer force.

We currently anticipate that there will be manpower supply problems in the following areas:

-- Combat arms enlistees, for whom the authorized and funded combat arms enlistment bonus will be used as needed.

-- Officers with professional qualifications, such as physicians and lawyers, and enlisted members with special skills.

-- Guardsmen and Reservists, whose past enlistments have been largely draft motivated and whose end-CY 1971 total strength was almost 45,000 below the FY 1972 mandated average strength. While greatly expanded recruiting efforts are being made, it is possible that such incentives as bonuses may be needed to stimulate enlistment and re-enlistment in the Guard and Reserves.

1. Enlisted Accessions

The Services will require 630,000 new enlisted accessions in FY 1973, 515,000 for the active forces and 115,000 for the Reserves. This requirement represents about one-half of the males qualified for military service who will reach age 19 during the year. Two countervailing factors will influence voluntary accessions. First, diminishing draft calls and the prospect of the end of the draft will tend to lower the enlistment of men who volunteer in preference to being drafted. On the other hand, the recently enacted pay increases and Project Volunteer incentives can be expected to raise the number of

true volunteers. We cannot predict with any accuracy how these two factors will interact, but can probably expect peaks and valleys in our accessions.

During the past year, major emphasis has been given to strengthening our recruiting capability. Both the number of recruiters and recruiting stations have been increased. Recruiting offices have been refurbished and recruiting advertising has been increased. Special duty assignment pay of $50 per month has been authorized for recruiters. The training of recruiting personnel has been improved. The Congress provided additional assistance when it authorized payment of necessary out-of-pocket expenses which recruiters incur while doing their job.

2. Officer Accessions

Another area of interest associated with transition to an all-volunteer force is the status of officer accessions. Although the ROTC program which is the largest single source of newly-commissioned officers, experienced a drop in enrollment for the fifth straight year, there is a growing optimism over the program. Modest increases in enrollments are expected next year. Enrollment in the Platoon Leaders Class (PLC), the most important source of officer procurement for the Marine Corps, has been below the level needed to meet projected requirements. Recent beginning enrollment experience in both programs is shown in this table:

Academic Year	ROTC Enrollments	PLC Enrollments
1968-69	218,466	2,921
1969-70	161,507	2,255
1970-71	114,950	2,325
1971-72	87,807	2,427

The two primary causes of these shortfalls have been a continuing trend from compulsory to elective ROTC, and lessening pressure from the draft.

Two developments should help to overcome this problem, although they may not provide a final solution. First, recent legislation increased the number of ROTC scholarships, raised the subsistence payments to ROTC students, and authorized subsistence payments to PLC cadets. This legislation should make these programs more attractive to the college student. Second, officer requirements have decreased, particularly in the Army, which has experienced the greatest drop in enrollment. As a result, the Army will be able to assign about 7,000 of its newly commissioned ROTC graduates to fill officer requirements in the Reserves in FY 1973.

A final aspect of officer procurement in a zero-draft environment is the problem of meeting the Services' requirements for lawyers and physicians.

Despite our best efforts, the Department of Defense has been unable to attract and retain the number of well-qualified career military lawyers needed to meet minimum requirements. The Department of Defense has sponsored legislation designed to provide financial incentives needed to attract and retain quality military lawyers. This legislation was enacted by the House of Representatives in July 1971, and is currently pending action in the Senate.

During CY 1971 the Selective Service System was requested to call 1,608 physicians under the doctor draft for entry on active duty during the first seven months of FY 1972. Primarily because of the doctor draft call, CY 1971 Berry Plan participation improved over that of CY 1970. It is anticipated, however, that the CY 1972 Berry Plan participation will again decline significantly because of the approaching expiration date of the current draft law and overall reductions in the total strength of the active forces.

To meet the critical need of the military services for medical personnel, I again recommend increasing support of medical school students through medical scholarships. Under this proposal, the Department of Defense would, in effect, exchange subsidy of the individual's education in medical school for a specified period of military service. The House passed our medical scholarship proposal on November 3, 1971, and it is now pending in the Senate. While we hope to retain many physicians and dentists for continued military service beyond their initial obligations, many of these personnel will not remain in military service indefinitely. However, those who do not choose a military career will, after their period of obligated service, help to reduce the nationwide shortage of medical personnel.

Before leaving the subject of the zero draft and the all-volunteer force, I must again bring to your attention the incontrovertible fact that pay and improved management of people alone will not achieve this goal. The support of the public, particularly as reflected in the attitude of the American people toward their Armed Services, is vital to the success of the program. We cannot expect to recruit or maintain a high-quality volunteer force with good morale and discipline if a significant segment of our citizenry looks on the Armed Services with scorn. I ask the members of the Congress to join us in taking the lead in manifesting respect and support for the Armed Services -- an essential step toward the all-volunteer force.

E. MANNING AND TRAINING THE RESERVE FORCES UNDER THE TOTAL FORCE CONCEPT

One of the major challenges in moving to an all-volunteer force and implementing the Total Force Concept is maintaining the strength of the Reserves and Guard. It is especially critical that the strength of these forces be maintained because, under the President's policy, the Reserve and Guard will be the initial and primary sources for augmentation of the active forces in any future emergency.

Our experience during the past year, with the three-month draft interruption in the summer and low draft calls during the final months of 1971, indicates that it will be difficult to meet Guard and Reserve strength requirements as draft calls decline toward zero. The long and long-standing waiting lists of draft vulnerable applicants for Guard and Reserve membership have disappeared in most Reserve Component units, and actual strengths have dropped below statutory minimums.

The solution which we propose for these manning problems is to couple a vigorous and aggressive recruiting effort with a program of visible incentives which will make Guard/Reserve service an attractive avocation. We are not underestimating the incentive value of genuine missions and good equipment, and, indeed, we have evidence that these are effective motivators in some cases. One Army National Guard unit in Kentucky, for example, which had suffered significant losses of its experienced non-commissioned officers found these same people returning, and skilled prior service personnel applying, for membership after the unit received its complement of M-60 tanks and obtained a site where these new tanks could be used to develop combat readiness.

We are also confident that the incentives already enacted as part of the Military Selective Service Act (P.L. 92-129) will provide a measure of motivation for non-prior service people to enlist in the Guard and Reserve. Raising from $19 to $43 a month the supplemental income that a man receives upon his return from initial active duty training is a good selling point for our recruiters, particularly among low-income groups. This should be of special assistance in recruiting among minorities where we need to increase representation in the Guard and Reserve program.

Another provision of this same act permits, for the first time, payment of quarters allowance to young Guardsmen and Reservists with dependents during their initial four to six months active duty training. While this assistance does not compensate for the loss of civilian income or interruption of education involved, it does make it more nearly possible for the young married man to make ends meet during this critical post-enlistment period.

We are also pursuing new initiatives in the recruiting of prior service personnel. The Army has tested and is now implementing fully a program which allows early release from active duty for persons joining units of the Guard and Reserve. The test program was highly successful. As of October 29, 1971, some 31% of the separating servicemen interviewed had committed themselves to service with Selected Reserve units and, among these, some 46% of the black personnel made Reserve commitments. We have asked the Navy and Air Force to examine the advantages of a similar approach as an aid to meeting Guard and Reserve strength requirements.

Another approach we are stressing is the direct procurement of non-commissioned and petty officers in the Guard and Reserve. This administrative procedure permits the enlistment of individuals, whose civilian acquired skills are compatible with military skill requirements, at a pay grade higher than would normally be allowed.

Although recruiting efforts have been intensified and some favorable results have been obtained by using incentives now available, the results have not been sufficient to meet requirements. We are proceeding with the development of additional incentives which can be used as tools for recruiting and retention.

Moreover, we have included in the FY 1973 Budget funds to strengthen both local and national recruiting efforts by providing recruiting materials, offsetting the out-of-pocket expense of the people involved, and providing training which will enhance the ability of key people to perform their recruiting task.

Many of the incentive proposals we have selected as promising the greatest help for Guard and Reserve manning have been introduced in one form or another by members of the Congress. For the items which require legislative action we are in the process of getting our legislative proposals, as well as reports on legislation which has been submitted to us for comment, to the appropriate committees of the Congress. As one example, we have supported a bill to provide equity for Guardsmen and Reservists in the area of medical, dental and death benefits.

Among the other significant incentives being considered are:

-- A proposal to establish a variable enlistment and selective re-enlistment bonus, which would assist the Services not only to acquire the total numbers of people needed, but also to meet critical shortages in particular skills or geographic areas. These bonuses should encourage long-term enlistments and re-enlistments, and thereby improve readiness levels and enhance the stability of the Guard/Reserve portion of the Total Force.

-- A proposal to extend Serviceman's Group Life Insurance (SGLI) coverage to Guardsmen and Reservists on a full-time basis, and to those who have completed the required service but not attained the minimum age for retirement, so that their families will have a measure of protection in case they die before drawing retirement pay.

-- A proposal to allow Guardsmen and Reservists with 25 years of creditable service to retire at age 55 rather than at age 60 (this is comparable to retirement at age 60 with 20 years creditable service, which is now permitted).

-- A proposal to allow persons who have completed all requirements for retired pay, except reaching the minimum age, to elect at age 50 either a lump sum payment in lieu of further claims or a reduced annuity on an actuarially sound basis.

Our intent is to design a program which can be implemented on a phased basis, so that we can evaluate each incentive or other

action before adding the next in order to determine relative effectiveness of each item as an aid to recruiting and retention. The pay raise is now in effect. Recruiting effort is being intensified within existing funds. As soon as sufficient experience has been gained with these ongoing programs, we shall be in a position to determine the required scope of follow-on programs such as the variable re-enlistment bonus. Evaluation of such a next step would provide a basis for proposing an enlistment bonus if this were needed as a supplemental incentive. Other portions of the program would be designed to be applied at appropriate times as implementation of the program proceeds.

We are concerned with the early indications of shortfalls in strength of the Selected Reserves of the Guard and Reserve Components (45,000 below statutory strength minimums at the end of Calendar Year 1971, as shown on the following table).

GUARD/RESERVE STRENGTH TRENDS FY 1972

	ARNG	USAR	USNR	USMCR	ANG	USAFR
Mandated Strength	400,000	260,000	129,000	45,849	88,191	49,634
June	402,175	263,299	130,041	47,006	85,689	50,788
July	398,324	264,332	127,558	46,614	85,750	49,453
Aug	394,790	261,215	125,372	45,852	85,594	48,587
Sep	391,178	258,694	122,696	44,880	85,705	48,224
Oct	387,795	254,934	120,685	43,536	86,277	47,568
Nov	383,711	251,872	119,645	42,401	87,052	47,354
Dec	380,742	249,351a/	120,976	42,364	87,215	47,196a/
Shortfall	-19,258	-10,649	- 8,024	- 3,485	- 976	-2,438
% Shortfall	- 4.8%	- 4.09%	- 6.22%	- 7.6%	- 1.1%	- 4.9%

TOTAL DOD SHORTFALL -44,722

a/ Tentative Data

If this trend is not halted by higher pay and accelerated recruiting, then it will become necessary either to request authority for bonuses to stimulate Guard and Reserve enlistments or, as a last resort, to develop legislation which will allow us to draft people into the Selected Reserves.

We are hopeful that the impact of the November and January pay increases, coupled with intensive recruiting and retention efforts in all the Reserve Components, will produce a reversal of the current strength trend. However, if the shortfalls continue, we must initiate action in the April-June period of this year to present legislation to the Congress for authorization to use bonuses. At the same time, we would have to initiate the necessary reprogramming and supplemental funding for FY 1973 to accommodate such a bonus.

The possible use of a draft for the Selected Reserve of the Guard and Reserve may, as noted, become a necessity, but it is not considered such today. I believe that, if the incentives we are developing go forward and are implemented, we can attract adequate men and women volunteers for the National Guard and Reserve. I do not want to press for a draft authorization unless that becomes absolutely essential, and I do not think that it is at this point.

Solving the manning problem is an essential element of our efforts to improve reserve readiness. Equally important, however, are improvements in the training we provide to Reserve and Guard units.

Some units, particularly in the Army National Guard and Army Reserve, are experiencing difficulty in obtaining accessible sites for weekend readiness training. But our mobilization capability is being enhanced by increased participation in realistic mission training and closer association with active force units.

Army National Guard and Army Reserve

During the past year, the Army has initiated a program to provide Reserve Component units access to modern equipment, current doctrine and training facilities through association with Active Army units. The Reserve Component unit will still need its full complement of combat serviceable equipment, but the Reserve/Active association will permit personnel to become familiar with newer and more up-to-date types of equipment that are not yet available to the Reserve Component unit.

The Active Army also benefits by receiving maintenance support and services from Reserve Component units which would not otherwise be available. An example of this advantage is provided by three National Guard Transportation Aircraft Repair Shops (TARS) which perform maintenance on Army aircraft on a full-time basis, using technicians and other National Guard personnel. These shops repair and rebuild aircraft for both the Active Army and the Reserve Components, but receive their workload through Active Army channels. A high proportion of aircraft returning from overseas is rebuilt at these facilities.

Another interesting approach is to integrate the Reserve Component unit with the Active unit. The practical application of this concept was implemented last year when three Army Guard tank and two Army Guard mechanized battalions were associated closely during their annual training with the 1st and 2nd Armored Divisions at Fort Hood, Texas. The experiment appears to have worked satisfactorily.

This past summer the arrangement not only was repeated, but it was also expanded by having the 72nd Mechanized Infantry Brigade (Texas) train concurrently with the experimental 1st Cavalry (TRI-CAP).

In addition to these efforts, we are also pursuing more limited forms of association. Units which have achieved company level readiness in Army training tests may participate in active Army exercises in order to measure their capabilities against those of active units. Moreover, the Continental Army Command has implemented a program in which company-size Reserve Component units conduct training with Army units at nearby active installations. The Army Materiel Command is pursuing a similar program for Reserve Component combat service support units.

We are looking at other approaches to Reserve training. In May of last year, we directed that a comprehensive review of Reserve Component missions, programs, and manpower levels be made. A joint Service study group completed the review on July 15, 1971. For the Army, thirty-three concepts were identified which showed promise as means of improving Army Reserve Component readiness and Total Force capability. The Army is in the process of developing the program, schedule, and related cost data for the concepts to be tested and evaluated.

Naval Reserve and Marine Corps Reserve

During the year, the Naval Reserve attack air squadrons completed their reorganization into two combat-oriented Reserve Air Wings. This past summer these units deployed as full wings aboard Active Navy aircraft carriers, logging more than 1,700 jet landings without accident and attaining, for the first time, measurable levels of combat readiness attested by operational readiness inspections.

Naval Air Reserve anti-submarine warfare units also were reorganized into two ASW groups and 12 fleet-sized patrol squadrons. The ASW carrier groups, like the attack wings, conducted extensive operations during the summer, logging more than 2,000 carrier landings and receiving a fleet evaluation of "Excellent."

Members of the patrol squadrons received both training and operational experience as a result of participation in Active Navy operations. One squadron deployed to Okinawa for two weeks in support of Western Pacific commitments. Others rotated crews to Rota, Spain, throughout the summer to furnish support for 6th Fleet surveillance efforts while accomplishing their two-week active duty for training.

Also working with naval forces in the Mediterranean was the Naval Reserve destroyer USS GEARING (DD710), manned on a rotating basis by Reserve crews airlifted from the United States for two-week tours to augment its full-time nucleus crew.

As a result of testing of new mission concepts for the Naval Reserve, the Navy activated the first Naval Reserve Coastal/Riverine unit at Little Creek, Virginia.

The Marine Corps continued to integrate the 4th Marine Division and 4th Marine Aircraft Wing into Active Marine Corps training exercises to maintain the force at mobilization readiness training standards. The routine exercising of USMCR units of battalion, regimental and larger size in close coordination with Active Marine Corps units assures the availability of forces which can be deployed in accord with mobilization plans.

Air National Guard and Air Force Reserve

Tactical fighter, reconnaissance and airlift units of the ANG participated in seven joint exercises with active units of the Armed Forces. Two of these exercises were in Europe, two in Alaska, one in Panama, and the remainder within the contiguous United States. Air Force Reserve tactical airlift and special operations units also took part in numerous exercises supporting Army and Air Force requirements.

The ANG continued its active role as a part of the integrated air defense system, providing some 57% of the total interceptor units within Aerospace Defense Command and intercept force in Hawaii. Where the ANG units are located on the same base with Air Force air defense units, as are those at Bangor, Maine and Spokane, Washington, operations are integrated to insure maximum capability for both USAF and ANG units.

ANG units assigned military airlift missions continued to supplement MAC capability as a by-product of training. The Air Force Reserve has formed its 13th and last C-141 associate unit. Further plans for expansion of this productive and economical program call for four C-5 associate units in Fiscal Year 1974.

In addition to participation in Active Forces exercises and continuing operations, the ANG and USAFR provide aircrew training for themselves and the Active Air Force. The USAFR Combat Crew Training Center at Ellington AFB, Texas, trains C-130 crews, and ANG units at

Tucson, Arizona and McConnell AFB, Kansas, provide combat crew training for F-100 and F-105 Air Reserve Force aircrews. In addition, the ANG unit at Ellington AFB provides advanced interceptor training in F-101s and F-102s.

These training initiatives not only produce measurable improvements in readiness, but also enable all elements of the active and reserve forces to test and apply new concepts of training and organization which promise greater progress and more productivity in development of Total Force capability.

Closely related to the training problem is the need to improve the means of supporting and maintaining the modern equipment that the Reserve Components are receiving. Increases in the number and complexity of major equipment items create a critical requirement for full time personnel to make the equipment a readiness asset rather than a storage liability. Congressional action to increase the ceilings on National Guard technicians has alleviated a major problem in this regard. We are also taking steps to insure that the other Reserve Components have sufficient technicians to provide the essential full-time backbone of the mobilization force.

Another requirement related to equipment is the availability of adequate facilities. Not only must we provide secure areas for the storage and maintenance of equipment but we must also help our units to locate sites where this equipment can be put into action in live training through-out the year. We are carefully reviewing all previously approved and proposed construction programs to assure that available funds are being applied to properties used for Guard and Reserve training and to insure the continued availability of such properties.

Reserve Forces Policy Board

The Reserve Forces Policy Board has prepared a Report to the Congress, as required by Title 10, Section 133.1c of the United States Code. This report has been provided separately to the Committee for inclusion in the Record at whatever point the Committee desires. As I expressed to the Chairman of this Committee in my letter of November 13, 1971, my written report covering the expenditures, work and accomplishment of the Department of Defense, together with the personal reports by me and the senior officers of the Department of Defense, are deemed to satisfy requirements established for the Secretary of Defense and the Secretaries of the Military Departments by that same section of the code.

Summary

The progress made in 1971 and planned for 1972 and 1973 by no means brings us to full attainment of the Total Force objective as far as the National Guard and Reserve are concerned. The units of the Selected Reserve will require continuing priority attention in order to improve their readiness and reduce post-mobilization deployment times as they take on additional responsibilities.

A number of studies and analyses have been conducted during the past year. All of them will be used, along with our continuing analysis of readiness and capability, as a basis for determining the future force mix between the Active Services and the Reserve Components and for insuring the availability of the support required for the Guard and Reserve to perform their assigned portion of the total national security mission.

F. IMPROVEMENT OF MILITARY LIFE AND ACHIEVING HUMAN GOALS

To maintain the effectiveness of a force reduced in numbers, life as a member of the Department of Defense team must be made as attractive as possible without sacrificing good order and discipline. Many policies and programs to achieve this goal are also logical steps toward an all-volunteer force. Most of them, however, are simply matters of fairness and equity toward the men and women, both military and civilian, who serve the nation faithfully.

We must continue to view some of our self-perpetuating practices with critical eyes. For example, Kitchen Police (KP) duty and janitorial duties contribute little to the individual's military skills; the time spent on these tasks could better be devoted to training and other primary duties. The Services have started contracting these services to civilian organizations to release military personnel for military duties. We intend to continue efforts in this area to obtain better utilization of personnel in their military skills and to improve morale.

I continue to believe that adequate housing for both married and single personnel is a morale factor of prime importance, and this conviction is reflected in this Administration's budget submissions. While the FY 1969 budget contained a request for the construction of only 2,000 new units of family housing, the numbers requested have increased significantly to 9,684 in FY 1972 and 12,181 in FY 1973.

Good progress is also being made in developing housing for lower income military families under the provisions of the National Housing Act. In cooperation with HUD, community housing subsidized by FHA is being made available to these families on a preferential basis. The FY 1971 program provided 4,300 units in 14 locations, and 5,050 additional units in 38 locations are included in the FY 1972 program. Further housing gains from this source are expected during FY 1973.

We are also moving toward the goal of offering adequate quarters to all of the single military personnel who live in barracks and bachelor officer quarters. From FY 1969 through FY 1972, over 100,000 new and replacement barracks spaces and more than 9,000 bachelor officer quarters spaces will have been provided. The FY 1973 program calls for construction of about 34,600 barracks spaces and approximately 900 bachelor officer quarters spaces. In December, we concluded an agreement with the Federal Republic of Germany under which the barracks our soldiers occupy in Germany will be extensively renovated. We are improving existing barracks with emphasis on semi-privacy and enough furnishings to provide decent accommodations and meet ordinary, but not fancy, living standards.

We are continuing to improve the opportunities for service personnel to develop intellectually and gain civilian qualifications or marketable skills.

We have emphasized strengthening and broadening of existing Service programs to bring a full range of educational opportunities to the serviceman at his job site wherever it may be. We have placed special emphasis on high school completion and career or vocational opportunities. Two recent acts of Congress have been highly beneficial. Public Law 91-219, the Predischarge Education Program, provides additional benefits for servicemen who desire to complete high school or to take special courses to continue their education or training. Public Law 91-584 makes Veterans' Educational benefits available to servicemen after six months, rather than two years, of active duty. An Administration bill introduced in the last session of Congress would allow further expansion of in-Service education by providing higher education benefits.

Support for the DOD Overseas Dependents Schools is especially important to the morale of military families. The Department of Defense is continuing its efforts to provide quality educational programs for approximately 155,900 students enrolled in these schools and other 18,000 enrolled in tuition-fee schools. The funding

level planned for Fiscal Year 1973 will permit dependents schools to operate at an average pupil-teacher ratio of about 25:1 for kindergarten and elementary schools and 22:1 for secondary schools. These ratios are comparable to those of school systems of similar size in the United States. The North Central Association of Colleges and Secondary Schools (NCA) has indicated that, in general, the quality of education, the level of teaching and the general support of these schools compare favorably with the best schools in the United States.

Last year the Department took action to increase the scope of legal services available to military personnel and their dependents who are unable to pay civilian legal fees. Under a limited pilot test program, military attorneys in cooperation with state and local bar associations and judiciary have provided free professional legal services, including representation in civilian courts, to eligible personnel. Although the test program will not be completed and evaluated until mid-1972, the reaction to the program by both the civilian and military communities has been most encouraging. The final evaluation of the program and the determination whether it can be applied service-wide will in large measure depend upon the availability of sufficient military lawyers and funds. If the program proves to be feasible, it will be another step in the improvement of of military life.

Several major programs in support of one of the Department's Human Goals which have been reaching larger numbers of people in and outside the Defense Department each year will continue in FY 1973. Project TRANSITION, furnishing predischarge counseling, educational services, vocational training and job assistance to service personnel, is one. Since 1969 approximately one million personnel have received vocational counseling, and 175,000 have received vocational training under this program.

During FY 1972 and 1973, in compliance with the President's six-point program for veterans announced in June 1971, we are extending TRANSITION services to include Southeast Asia, the Far East and Europe and expanding services in the United States. Other new programs include vocational counseling and training in the drug control program and special skill training for 12,000 servicemen whose experience has been limited to combat-type jobs.

A similar endeavor is the REFERRAL Program, established in August 1970, to assist career personnel who are retiring in locating potential jobs.

The Department has continued to encourage the involvement of local installation commanders with their surrounding communities. The degree of success can be told in these figures describing the numbers of young people who were provided recreational, educational and training activities on military bases throughout the United States.

1969	250,000
1970	775,000
1971	2,700,000

The Department of Defense has taken a leading role among Federal agencies in the employment of the disadvantaged. For example, the Department has exceeded its quota for summer youth employment in each of the past three years, and has also operated special programs for the employment of Indian youths and Neighborhood Youth Corps enrollees.

G. SPECIAL PROBLEMS - RACE RELATIONS AND DRUG ABUSE

Two special problem areas were mentioned in my report last year -- race relations and drug abuse. In both, progress has been made.

1. Race Relations and Equal Opportunity

As we continue to translate the principle of equal opportunity established by the Department's Human Goals Statement into programs designed to increase the quality of military life, we have relied heavily upon methodologies designed to improve communications while yielding visible, measurable progress.

During the past year, the Military Departments and Defense Agencies initiated important new policies, including the setting of the numerical goals and timetables for minority employment. To invigorate managerial interest and compliance with the Equal Opportunity Program, each military and civilian manager's performance rating now includes an assessment of his effectiveness in this crucial area. We have also undertaken a detailed review of our Equal Opportunity grievance system.

The tangible results of these and earlier policies can be judged by advancements made by minority group members within the Department of Defense. These advancements are especially noteworthy because they occurred during a period when the total manpower strength was declining.

On the civilian side, since November 30, 1969, the numbers of minority group members in senior management positions (GS-13-15) has risen as follows: Blacks by 9.2 percent, from 977 to 1,067; Spanish-surnamed personnel by 15.6 percent, from 262 to 303; and Orientals by 6.2 percent, from 451 to 479. In the military services, the number of individuals of minority groups holding the top enlisted grades has shown a steady increase. Programs have been developed to increase the number in hard-skill job fields. In the officer corps of the Services, six of the officers selected for general or flag rank were from minority groups, and we continue to increase the input of junior officers from minority groups through intensified recruiting. Seven predominantly black colleges have been added to the Reserve Officer Training Corps program, bringing the number of such schools participating in the program to 26. At the Service Academies, the current minority enrollment total is 463; the 185 in the entering classes alone exceed the number of minority graduates during the preceding decade.

Progress in securing the right of all military personnel to available off-base housing has continued. During the past year the program was extended to overseas areas. In the United States, as of December 1971, 98 percent of over 36,000 multi-unit rental facilities surveyed are pledged to a policy of nondiscrimination. During the past two years black military occupancy of these facilities has increased by nearly 50 percent.

Despite our efforts in the Equal Opportunity Program and growing understanding on the part of most members of the Department of Defense of the gravity of the problem of race relations, we continue to experience a level of disharmony which has the potential for impairing our overall mission. In addition to renewed command emphasis, we are making new efforts to improve communications and understanding among the members of the different races through education.

Education in the dynamics of difference is one of the most important steps the Department of Defense has undertaken. Most people enter military service with insufficient knowledge of, and appreciation for, the culture, history, experience and sensitivities of persons of other races to enable them to function well in a multi-racial environment. In an effort to bridge the communication gap, on June 24, 1971, I established the Defense Race Relations Institute (DRRI). Located at Patrick Air Force Base, Florida, the DRRI graduated its pilot class on December 10, 1971. Students are drawn from the officer and enlisted ranks of the Services; upon completion of the seven-week course they are returned to their units as race relations instructors.

The Services have introduced ethnic literature, music, foods and cosmetics at commissary and exchange facilities. Sales in excess of $4,000,000 since the inception of this new program in 1970 indicate an increased sensitivity on the part of the Services to the minority serviceman's desires and needs.

The Department has continued to enforce equal opportunity requirements among Defense contractors. During 1971 under DOD compliance review total minority employment rose in the nation's five largest textile firms from 21,031 to 31,182, an increase of 48 percent between 1968 and 1971. During the same period minority employment gains were achieved by six major DOD aerospace contractors despite a 29 percent decline in their work forces. These gains include those of the McDonnell Douglas Affirmative Action Program, which has demonstrated good results during the past two years. Our minority employment objectives have also been attained in most DOD construction projects.

2. Drug Abuse and Related Problems

In dealing with the problems of drug abuse, including the improper use of alcohol, in the armed forces, we remain committed to providing to the serviceman a total program, which emphasizes prevention through education, as well as treatment, and rehabilitation of identified drug users.

We now have comprehensive programs in each service to educate their members in the dangers of drug and alcohol abuse. The amnesty program, now called the exemption program, is no longer on a trial basis, but was implemented service-wide in early July 1971.

The hard drug problem is still centered primarily in Southeast Asia. Consequently, we directed on June 17, 1971, that operational plans be placed into effect to increase our control efforts in this area. These included:

-- Testing of servicemen departing Vietnam to identify those who are using, or dependent upon, drugs.

-- Detoxification treatment for service members so identified prior to their return to the United States.

-- Opportunity for a minimum of thirty days of treatment in military facilities in the United States for service members whose terms of service are expiring and who need and desire treatment when Veterans Administration or civilian programs are not available.

-- Opportunity for treatment and rehabilitation for service members with time remaining in service. When extensive treatment is indicated, they will be phased into Veterans Administration programs as such become available.

Testing for presence of drugs for all returnees from Vietnam was in effect by June 21, 1971. Detoxification centers were established

in Vietnam, and rehabilitation facilities were set up there and in the United States. Since the initiation of these renewed efforts, the programs have been expanded to test and identify personnel for drug abuse on a worldwide basis.

As a result of our intensive efforts in Vietnam to control drug abuse, we can state we have succeeded in reversing a heroin epidemic within a year of its beginning to be a major problem. This has been shown dramatically by the reduction in the number of drug abusers detected at time of departure from Vietnam. From a high of 4.0% of returnees in August, this figure has dropped to 2.5% in December 1971. Other usage indicators in Vietnam such as deaths attributed to drug abuse and apprehensions for drug abuse are also down.

We believe these encouraging trends are due to:

-- Improved educational efforts which have removed the myths and glamour from drug abuse. We have emphasized the presentation of facts to allow for intelligent decisions on the part of those for whom drug abuse may be a temptation.

-- Identification procedures including random unannounced testing of units and individuals. This has assisted our commanders by giving them knowledge of the true status of drug abuse in their units, highlighting areas where the problem is the greatest, providing treatment for those identified as abusers, and acting as a deterrent for potential experimenters.

-- The initiation of comprehensive rehabilitation programs in Vietnam for those who turn themselves in under the exemption program and those who desire treatment after being identified as a user through the urinalysis testing.

This combination of education, detection and treatment in Vietnam has reduced significantly the numbers of servicemen returning to the United States with a drug habit and has greatly improved the chances that those involved with drugs will be able to enjoy a useful, drug-free life when they do return.

In connection with our emphasis on drug abuse in the military we have been increasing our emphasis in the area of alcohol control. The Department of Defense recognizes that in some respects alcoholism is even more formidable than narcotics abuse because of its insidious nature, the difficulty in early recognition and evaluation, and the universality of alcohol use. For these reasons, and the fact that consumption of alcohol is legal, the solutions are even more difficult. However, the services have made progress in educating personnel, altering attitudes and gaining treatment and rehabilitation experience through pilot rehabilitation programs and will continue to focus on this very serious problem.

H. MANPOWER STABILIZATION

The Department of Defense manpower reductions that have occurred under this Administration are of a magnitude topped only by the massive demobilizations following the two world wars. Table 4 displays past and planned manpower strengths for active duty and reserve military personnel and direct-hire civilians.

Reductions in strength of this pace and magnitude have created hardships for many members of the Department of Defense. While the personal hardship and turbulence for many of our military personnel has been real, it has been possible in the aggregate to manage the great bulk of military strength reductions through lower accessions and voluntary early releases of officers and men before their normal separation dates.

However, while it has been possible to hold down accessions of civilian employees, there has not been a widespread desire to leave government service. A "Stability of Employment" program to minimize involuntary separations was therefore established early in the period of drawdown. Under this program employment freezes have been used to retain vacancies for personnel who would otherwise be released. The skills of employees facing release are matched with vacancies throughout the Department of Defense, and the employees are given priority right to vacancies through a computerized placement system. This system has worked well, placing more than 45 percent of the employees who would otherwise havy been released. As civilian manning levels stabilize, we hope that normal attrition will cover future civilian reductions.

I have often said that people are our most precious asset. The manpower policies of the Department of Defense will continue to be formulated and carried out with this basic fact always in mind.

I

INTRODUCTION

The Defense Military Manpower Requirements Report of the Secretary of Defense is submitted to the Congress in accordance with Public Law 92-129. Because of the vital importance of military manpower and the broad defense issues that surround it, this Report for Fiscal Year 1973 goes beyond the minimum requirements of the law. This is done to improve understanding and thus make the national dialog about these important issues more productive. The time is past when broad and arbitrary changes can be made to defense manpower without affecting the national security posture.

This Report presents the Defense Manpower Requirements for FY 73, together with a summary of those factors related to the derivation, justification and explanation of these requirements. It should be read and used in conjunction with the FY 73 Defense Report to the Congress, submitted by the Secretary of Defense on 15 February 1972. That report contains a discussion of the National Security Strategy of Realistic Deterrence, the basic planning concepts related to implementing that strategy, and a brief summary of the manpower requirements derived from these planning concepts. This Report expands in detail on those manpower requirements.

This Report views the Department of Defense as a system whose final product is national security. It is a complex system, composed of many related parts, each of which contributes to the whole. These contributions, or outputs, taken together, form the final product. To produce outputs, any system needs resources. The Defense system is no different. And the most essential of all resources to the Defense system is manpower.

Overview of Manpower Requirements and National Security Policy

The basic national security objectives of the United States are twofold: the first objective is to preserve the United States as a free and independent nation, to safeguard its fundamental institutions and values, and to protect its people. The second objective is to contribute to the security of other nations with whom we have treaties or whose security significantly impacts upon our long-range security. Moreover, as President Nixon stated in his 1972 Foreign Policy Report to the Congress: "As the world's strongest power, this nation has important responsibilities to its friends as well as unique opportunities for improving global stability. American weakness would make no contribution to peace. On the contrary, it would undermine prospects for peace."

The President of the United States, as Chief Executive and Commander-in-Chief, has the responsibility of setting the broad national security policies and goals of this nation. It is the responsibility of the Secretary of Defense, in consultation with his military and civilian advisors, to

develop a comprehensive national security strategy to round out and implement the security objectives set by the President. This strategy, which is one of realistic deterrence, acknowledges that there are political, fiscal, strategic, and manpower realities, or parameters, which cannot be ignored in developing the defense program. Therefore, the Secretary of Defense, in order to minimize the risks to national security within those constraints, utilizes a total force approach to defense planning and evaluates the relative contributions, actual and potential, of the allied forces and our reserves, as well as our active duty forces.

In addition to the fulfilment of the national security strategy, the manpower required for the forces programmed is influenced by human productivity and by personnel policies. We are moving toward an All-Volunteer Force. This basic objective must be considered in terms of specific personnel policies, such as length of enlistments, nature and length of training, and services to be provided (medical care for dependents, commissaries, etc.). Men cannot be treated like machines and shuttled around on a schedule that would be optimum for meeting force needs but would lower morale or unreasonably disrupt the family lives of the men. The personnel policies we follow have substantial impact on the turnover of personnel in the Defense system and, consequently, on the support manpower we must have to maintain the planned manpower levels in the forces.

So the Services are guided by clear strategic concepts and personnel policies in developing their fiscally constrained force needs. Given a programmed force goal of, for example, x aircraft wings, y divisions, and z ships, the Services are charged with meeting that goal through a combination of equipment, manpower, and training. They must answer such issues as: how many crews are needed; how many men are needed to keep a plane serviced and flying; how much support does it take to keep a combat division in the field; what sort of headquarters does one need to direct the combat elements; what sort of training establishment must be maintained? The Services must address how the required manpower should be distributed into forward deployed units, active CONUS units, and reserve units in order to preserve the capability to deter or to respond to attack in a way whose timeliness is adequate to the threat, yet minimize the expense of maintaining adequate forces.

The Services and the Joint Chiefs of Staff next submit their force and manpower programs to the Secretary of Defense for review and decision on major force and manpower issues. These decisions by the Secretary of Defense represent the Secretary's approved force and manpower programs which, in turn, are the basis for Service preparation of their current fiscal year budgets. The budget submissions from the Services are then reviewed by the Secretary of Defense and the Office of Management and Budget. The decisions made in this budget review process become the basis for the Department of Defense portion of the Federal budget, which is, of course, reviewed and approved by the President.

Analytical Framework

Defense resources (manpower, weapons systems, organized units, and funds) are used in the ten Major Defense Programs. These programs are "major output" oriented (e.g., Strategic Programs include the resources associated with all aspects of strategic nuclear forces). Each program contains units (thus manpower) performing different functions (e.g., flying aircraft, maintaining aircraft, operating bases, etc.) but all having the same goal (i.e., providing sufficient and effective strategic nuclear forces for deterrence). However, many of these functions are common to more than one major program (e.g., base operations are required for strategic, general purpose, and mobility forces programs as well as for the non-force programs such as training and logistics). Since it is important to know how resources are used within each major program, this Report deals with military manpower in terms of major mission and support functions, i.e., Mission Forces, Other Missions, and General Support. 1/

Outline of the Report

In Chapter II we summarize the key policies and strategies established by the President and the Secretary of Defense which form the foundation for the military forces required to fulfill the national security objective. Chapter III describes the various kinds of "Mission Forces" we require, given the threats we face, to implement our policies and strategies. These forces are then translated into the military manpower required to man them. Chapter IV deals with the "Other Missions" which must be accomplished and how they are translated into manpower requirements. The "General Support" manpower required to maintain the programmed force levels is dealt with in Chapter V, followed by a discussion of economic aspects of manpower in Chapter VI. The rationale for forward deployments of our forces and their geographic locations comprise Chapter VII. The final Chapter, VIII, provides a summary of military manpower requirements by mission and by Service together with a discussion of average manyear requirements.

The following tables show the military manpower requirements of the Department of Defense for end FY 73 and the end strength and average strength authorizations required for each Service.

1/ A third important view is the appropriation structure. This structure provides information about the time profile of spending in each program and function (e.g., RDT&E is aimed at an improved defense program well in the future, procurement is aimed at improving and sustaining the program in the nearer future and the operating accounts (military personnel and operations and maintenance) are aimed at current operations). Although the appropriations accounts are not addressed in the Report, a diagram showing the relationship of Major Defense Programs, Major Mission and Support Functions and Appropriations is shown at Appendix A.

DOD MILITARY MANPOWER REQUIREMENTS a/
(Active Duty End Strengths in 000)

	FY 71 (Actual)	FY 72 (Estimated)	FY 73 (Estimated)
Mission Forces			
Strategic Forces	130	130	127
General Purpose Forces			
Land Forces	638	513	516
Tactical Air Forces	167	166	167
Naval Forces	205	206	195
Mobility Forces	72	64	57
Subtotal Mission Forces	1,212	1,079	1,062
Other Missions			
Intelligence and Security	91	75	68
Communications	55	52	50
Research and Development	37	37	35
Support to Other Nations	21	17	27
Subtotal Other Missions	204	181	180
General Support			
Base and Individual Support	580	513	506
Training	550	460	458
Command	138	129	121
Logistics	30	30	31
Subtotal General Support	1,298	1,132	1,116
Total DOD	2,714	2,392	2,358

a/ For the detail requirements by Service, see Chapter VIII.

NOTE: Details may not add to totals due to rounding. This applies to all strength tables throughout the Report. All manpower strengths in the Report are end strengths unless otherwise specified.

FY 73 DEFENSE MANPOWER REQUIREMENTS BY SERVICE
(End Strengths and Average Strengths, 000)

	Army	Navy	Marine Corps	Air Force	Total
Mission Forces	442 (477)a/	283 (358)	107 (130)	230 (434)	1062 (1399)
Other Mission	52	36	2	89	180
General Support	347 (312)	283 (208)	89 (66)	398 (194)	1116 (780)
Total End Strength	841	602	198	717	2358
Average Strength Required b/	870	601	198	727	2397

a/ The meaning of the numbers in parentheses is discussed in the paragraph following this table.
b/ See Chapter VIII for detailed discussion of the relationship of end strengths to average strengths.

It is important to note that categorizing manpower by functions gives rise to definitional problems. This is particularly evident in the case of General Support. As is explained in Chapter V, there are three tiers of support: organic, direct mission force, and central support. In the current categorization, the direct mission force support is categorized either with the mission forces or with general support; this varies by Service and function. Thus inter-Service comparisons of support are not valid. As the above table shows, General Support could vary by as much as 337 thousand, depending on the definitions of what functions are to be included in that category. The numbers in parentheses represent an alternative way of viewing manpower which excludes from General Support: base operating support; combat crew training; command and control of Mission Forces; and manpower responsible for maintenance and storage of war readiness materials. These categories of manpower can be considered direct Mission Forces Support rather than General Support. There is a major DOD effort underway to restructure and standardize manpower accounting.

P.L. 92-129 Reporting Requirements

Public Law 92-129 specifies the manner in which the Department of Defense is to explain and justify its force manpower requirements:

> "Such justification and explanation shall specify in detail for all forces, including each land force division, carrier and other major combatant vessel, air wing, and other comparable unit: (A) the unit mission and capability, (B) the strategy which the unit supports, and (C) the area of deployment and illustrative areas of potential deployment, including a description of any United States commitment to defend such areas."

These legal requirements are satisfied by the discussions in Chapters II, III, and VII, which deal with the relationship of forces and manpower to national security objectives and strategy (II and III); force unit missions and capabilities (III); the areas of deployment and potential deployment of our force units (III and VII); and U.S. commitments associated with these areas (III). In addition, for convenience, a set of summary tables which satisfy these reporting requirements of P.L. 92-129 has been extracted and is found at Appendix B.

P.L. 92-129 also specifies that manpower required for "support and overhead functions within the Armed Services" shall be explained and justified. Chapters IV and V of this Report treat these support manpower requirements.

II

KEY POLICY AND STRATEGY STATEMENTS

Two years ago, President Nixon clearly enunciated a policy designed to move this country and the world toward a generation of peace based on the principles of partnership, strength, and a willingness to join in meaningful negotiations. This is the basic policy underlying and driving the National Security Strategy of Realistic Deterrence.

Naturally, our national security strategy does not substantially change each year. The concepts and principles underlying the FY 72 Defense Military Manpower Requirement Report are equally valid for this report. We must, at a minimum, assure that for the decade of the 1970s the United States:

-- Preserves a sufficient strategic nuclear capability as the cornerstone of the Free World's nuclear deterrent.

-- Develops and/or continues maintenance of Free World forces that are effective, and minimizes the likelihood of requiring the employment of strategic nuclear forces should deterrence fail.

-- Pursues an International Security Assistance Program that will enhance self-defense capabilities throughout the Free World, and, when coupled with diplomatic and other actions, will encourage regional cooperation and/or security agreements among our friends and allies.

A. U.S. Nuclear Strategic Policy

The President has set forth criteria for strategic sufficiency of U.S. strategic offensive and defensive nuclear forces. Our objectives derived from these criteria include:

-- Maintaining high confidence that our second-strike capability is sufficient to deter an all-out surprise attack on our strategic forces.

-- Providing no incentive for the Soviet Union to strike the United States first in a crisis.

-- Preventing the Soviet Union from gaining the ability to cause considerably greater urban/industrial destruction than the United States could inflict on the Soviets in a nuclear war.

-- Defending against damage from small attacks or accidental launches.

B. Theater Nuclear Forces

An integral element of our deterrent and our ability to defend

in a theater conflict are our theater nuclear forces. These forces, in conjunction with strategic nuclear forces, deter a Soviet theater nuclear attack and by increasing the uncertainty as to the circumstances in which nuclear weapons would be used help deter a non-nuclear attack. In Asia, theater nuclear forces, in conjunction with strategic nuclear forces, deter Chinese or Soviet theater nuclear threats and may deter conventional attacks as well. Our planning reflects a continuing need to have realistic nuclear options for each theater which do not require sole reliance on strategic nuclear weapons.

C. U.S. General Purpose Forces

The application of basic U.S. strategy to general purpose forces requires that we plan forces which are able concurrently to: (1) either conduct, with our NATO Allies, a non-nuclear initial defense of NATO Europe against a Soviet-Warsaw Pact attack, or conduct, with our allies, a defense against PRC-backed aggression; (2) provide materiel, logistic, advisory, and intelligence support and, if necessary, limited U.S. combat force assistance to our Asian allies against non-PRC-backed attacks; and (3) meet minor contingencies arising elsewhere in the world.

1. NATO

Nuclear weapons alone cannot pose an adequate deterrent to conventional attack. The advent of strategic parity and mutual strategic deterrence between the U.S. and the Soviet Union makes it even more vital that NATO have a credible conventional deterrent to attack by Warsaw Pact forces. Accordingly:

a. Allied forces, including U.S. forces in Europe and reinforcements from the United States, must be capable of a strong and credible initial conventional defense against a full-scale attack, assuming a period of warning and military preparation by both sides. In addition, the immediate combat capability of NATO forces, both U.S. and allied, should also be enhanced to provide greater assurance of defending against attacks made after the Pact gains a lead in mobilization.

b. All NATO partners should contribute their full share to the effort required to maintain an effective deterrent. The U.S. will continue to play a major and key role. But our Allies must also do their part and cooperate in enhancing NATO's conventional force capabilities.

2. Asia

In Asia, our policy is one of helping our allies develop and maintain the capability of defending themselves against threats short of a conflict involving PRC or Soviet forces. We plan for materiel, logistics, and intelligence support, and backup tactical air and naval support. We will have the capability for land force backup should that be required. However, we encourage our allies to develop their own land forces such that U.S. involvement, if any, would be limited. Our allies must accept primary responsibility for non-Chinese, non-Soviet supported contingencies. We will aid them but we will look to the nations threatened to assume primary responsibility for providing the manpower.

We also maintain the capability to assist our Asian allies against a PRC attack with conventional forces, provided we are not fighting in Europe.

3. The Seas

The buildup of the Soviet Navy must also be considered. U.S. and allied forces must be able to protect the sea lanes of communication in the event of a NATO conflict. Moreover, it is our objective to deny the Soviets the reasonable assurance of success should they undertake a conflict at sea.

D. Summary

The Nixon Doctrine requires that we take a total force approach. Accordingly, in considering the spectrum of potential conflict, we will be guided by the following principles in our defense planning:

-- In deterring strategic nuclear war, primary reliance will continue to be placed on U.S. strategic deterrent forces.

-- In deterring theater nuclear war, the U.S. also has primary responsibility, but certain of our allies are able to share this responsibility by virtue of their own nuclear capabilities.

-- In deterring theater conventional warfare -- for example, a major war in Europe -- U.S. and allied forces share the responsibility.

-- In deterring sub-theater or localized warfare, the country or ally which is threatened bears the primary burden, particularly for providing manpower, but when U.S. interests or obligations are at stake, we must be prepared to provide help as appropriate.

III

MISSION FORCES AND MANPOWER REQUIREMENTS

Introduction

The foregoing summary of our strategy provides the framework within which our forces are planned and evaluated. This chapter deals with those forces. Before dealing with the major forces in some detail, however, it is necessary to explain how force size and structure are determined. The first step in the planning-programming cycle is to derive from the broad policies and national security objectives set forth by the President a more concise and specific set of defense planning criteria.

For instance, it is not sufficient for force planning to state that U.S. policy is to insure the protection of Western Europe. In order for precise force programming to follow from the strategy, such details as the assumed length of preconflict mobilization must be specified.

The development of this amplified guidance is initiated by the Joint Chiefs of Staff and, through an iterative process with full participation of his military and civilian advisors, results in the Secretary of Defense approved Defense Policy and Force Planning Guidance. This guidance is then sent to the Service Secretaries and the Joint Chiefs of Staff. Once they are provided with the policies in sufficient specification, the JCS and Military Services participate in the force planning process in the following manner:

1. The threat is examined; detailed threat estimates are developed.

2. Against the threat, estimates are made of U.S. and allied forces needed to successfully deter an attack or defend against a potential enemy (i.e., prevent him from being confident that he could achieve his objectives at acceptable cost).

3. The present and future forces and capabilities of our allies are then assessed.

4. U.S. forces and capabilities are also assessed.

5. The combined U.S. - allied capabilities are then compared with the threat and assessed as to adequacy.

6. Our force planning is adjusted, and coordinated with our allies such that our joint capabilities are adequate to achieve our mutual objectives against the threat.

The above steps are performed in an iterative fashion with cooperation among the NSC, the OSD staff, the JCS, and the Services. The Services and JCS initiate, within the bounds of specified strategy, fiscal, and force planning criteria, the mix of forces which will best meet the national security goals. The Secretary of Defense reviews these proposals, using three central criteria: the contributions the forces make to the strategy; the possibility of tradeoffs to increase capability or reduce costs; and the tradeoffs among force structure, modernization, readiness and support. The third criterion merits further explanation.

Divisions, air wings, capital ships and the like, are the most highly visible component of defense capability, and, as such, they contribute heavily to the reassurance of our allies and to the deterrence of conflicts. It is tempting, therefore, to preserve major components of the force structure even though funds are shrinking. But to do so is to run the risk of obsolescence. An example of this in the FY 73 program is the retirement of Navy ships, and thus lower force levels in the near term, in order to fund essential modernization. By about 1975, Navy force levels would begin to rise as the ships currently planned are built and delivered to the fleet.

The readiness of our forces to deploy and to have the capability to fight in accordance with our strategy also demands funds which could otherwise go to force structure or modernization. There is no glamour associated with readiness, and the funds it needs, such as those required for training, equipment maintenance, depot repair, munition stockpiles, etc., are frequently the first candidates for removal when the budget is reduced.

The support necessary for the combat forces to operate as required is another element demanding resources. Support is a vital adjunct to readiness; reductions, while not visible, can sap a combat element of its capabilities.

Mission Forces are divided into two primary categories: Strategic Forces and General Purpose Forces. The following table shows the manpower required for these primary categories as well as for the subcategories which comprise them. It also provides the civilian manpower programmed for Mission Forces for FY 73 for comparative purposes.

DOD MISSION FORCES MANPOWER (000)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Strategic Forces				
Offensive	88	88	89	2
Defensive	27	26	24	14
Surveillance & Control	14	15	14	2
Subtotal	130	130	127	18
General Purpose Forces				
Land Forces	638	513	516	35
Tactical Air Forces	167	166	167	13
Naval Forces	205	206	195	*
Mobility Forces	72	64	57	30
Subtotal	1,082	949	935	78
Total Mission Forces	1,211	1,078	1,062	96

The remainder of this chapter will deal with the strategies and threat analyses that form the bases for our force and manpower planning. The ways by which force requirements are translated into manpower requirements will be an integral part of this discussion. We first address Strategic Forces with the treatment of General Purpose Forces comprising the final section of the chapter.

Strategic Forces

A. The Threat

The primary strategic threat to the U.S. -- the capability of the Soviet Union to deliver long range nuclear weapons against targets in the United States -- has been a matter of grave concern to us. Shown in the table below is a comparison of Soviet and U.S. strategic forces:

STRATEGIC FORCE STRENGTHS

	November 1, 1971		Mid-1972	
	USSR	US	USSR	US
ICBM Launchers	1520 a/	1054	1550 a/	1054
SLBM Launch Tubes	475	656	580	656
Heavy Bombers	140 b/	565	140 b/	531
Total Offensive Force Loadings a/c/d/				
Weapons	2100	4700	2500	5700
Air Defenses				
Fighter-Interceptors	3200	612	3100	593
SAM Launchers	10000	895	10000	839
ABM Launchers	64	0	64	0

a/ Includes SS-11s at MR/IRBM complexes.
b/ Excludes about 50 Soviet tanker and several reconnaissance aircraft.
c/ Data not available for November 1971. Figures are as of mid-year.
d/ Figures for USSR are presented as computed. They should not create an impression of precise intelligence.

Although projections beyond those shown become progressively less certain, especially where they extend beyond the production and deployment lead-times of the weapon systems involved, we must make such projections for future defense planning.

The Soviets have built up their ICBM forces at a rapid rate during the past five years, and as of the end of 1971, had some 1,520 operational launchers and they are continuing to construct new silos. Whether new or modified missiles will be deployed in these silos is not yet clear.

The Soviet ICBM threat is augmented by a substantial nuclear-powered ballistic-missile submarine fleet that is presently the fastest growing element of the threat. The most capable component of this fleet is the Y-class, which, like the U.S. POLARIS, has 16 tubes for launching missiles. There are now at least 25 of these submarines operational -- capable of launching 400 missiles with a range of 1,300 nautical miles. The additional ballistic missile capability in older Soviet submarines gives them a total of more than 500 launchers in the operational inventory. Another 17 Y-class submarines are in various stages of assembly and fitting out. At the current production rate of about 9-10 SSBNs per year, the USSR could develop an operational force of Y-class submarines by 1973 comparable in size to the current POLARIS/POSEIDON force. A longer range submarine launched ballistic missile is under active development. We cannot estimate deployment at this time.

The Soviet intercontinental heavy bomber force remains at around 200 aircraft (including about 50 tankers). Although we believe the Soviet medium bomber force of some 700 aircraft is targeted primarily against the Eurasian area, we cannot ignore the fact that these aircraft do have a one-way mission capability against the United States. A new swing-wing bomber, the Backfire, is undergoing flight tests, but its exact characteristics and future role have not been determined.

With regard to the strategic defensive forces of the Soviet Union, there is extensive deployment of aircraft defenses, as well as an ABM system deployed around Moscow. The Soviets have a large inventory of radars numbering in the thousands and a force of over 3,000 interceptor aircraft. There is a slight trend toward a reduction in the number of these interceptors, but the quality of the force has improved. Four new interceptors have been added since 1964, and these newer models make up a substantial part of the force. In addition, at least four different SAM systems, with about 10,000 launchers, are presently deployed for strategic air defense. There is concern by some of our technical experts that the SA-5 SAM might be capable of adaptation for certain ABM roles.

The Soviets now have four MOSCOW ABM complexes (ABM-1) operational. They are continuing construction of surveillance radars which could be a part of an ABM system, and are actively working on R&D related to development of new ABM system components, including a new missile.

As for the strategic nuclear threat of the Peoples Republic of China, its progress toward achieving an ICBM capability is continuing. We cannot state with confidence just when China will have an ICBM capable of striking the continental United States, but it is estimated that deployment could not occur before 1975, with some 10-20 missiles being deployed by mid-1976.

B. Rationale for Strategic Forces

In planning strategic forces our principal objectives are to meet the military criteria for deterrence, based upon the sufficiency criteria enumerated in Chapter II. To fulfill our objectives in strategic force planning, we strive to maintain a reliable retaliatory force, placing primary emphasis on measures that both reduce our vulnerability to attack and assure our ability to penetrate defenses. In addition, we seek to provide: reliable early warning capabilities to minimize the likelihood and consequences of surprise; appropriate defense forces to protect against accidental or small scale air and ballistic missile attack; and effective and reliable command and control of these forces.

We continue to believe that an effective defense of our population against a major Soviet nuclear attack is not now feasible. Thus, we must continue to rely on our strategic offensive forces to deter a Soviet nuclear attack on our cities. Since we rely on these forces for deterrence, we must insure that they are adequate to convince all potential aggressors that acts which could lead to nuclear attack or nuclear blackmail pose unacceptable risks to them.

Recent analyses of strategic force effectiveness indicate that planned strategic forces should continue to provide an adequate deterrent for the near term. We do have reliable and survivable strategic retaliatory forces, and their capabilities for retaliation today cannot be denied by nuclear attack.

C. Strategic Offensive Forces

The basis for our offensive force planning is the retaliatory capability of these forces. Our forces must be capable of absorbing a surprise Soviet first-strike and still be capable of destroying a significant

fraction of the Soviet population and industrial base. To insure high-confidence in our second-strike capability, we plan a mix of mutually supporting forces: land-based missiles, sea-based missiles, and bombers. Such a force mix provides (1) assurance that a Soviet technological breakthrough against any one element will not negate the effectiveness of the entire force; (2) a hedge against widespread failures of any element due to unanticipated nuclear weapons effects; (3) a compounding of Soviet offensive and defensive problems in attempting to defeat or defend against U.S. forces; and (4) reinforcement of the viability of each element by the presence of the other, thereby strengthening the credibility of the total deterrent posture.

Land-based missiles have a high alert rate, quick response capability, reliable command and control, and the capability to cover a broad range of targets.

Sea-based missiles offer dispersion and concealment, pose a threat from several directions with short time of flight, and because of their survivability, are capable of extending responses over a long period of time

Bombers can deliver large payloads with the accuracy needed to destroy hard targets, can restrike targets as necessary, and can provide damage assessment of earlier strikes. They also can perform tasks in non-nuclear war, such as their conventional bombing role in Southeast Asia.

We are continuing the program to deploy MIRVs in our Minuteman and Poseidon missiles. Should part of our missile force be unexpectedly and severely degraded by Soviet preemptive action, the increased number of warheads provided by the remaining MIRV missiles will insure that we have enough warheads to attack essential soft urban/industrial targets in the Soviet Union. At the same time, the MIRV program gives us increased confidence in our ability to penetrate current and projected Soviet ABM defenses, even if part of our missile force were destroyed.

Although we are continuing development work on two new strategic offensive systems, the Undersea Long Range Missile System (ULMS) and the B-1 manned bomber, they will not be deployed in FY 73 and no operational manpower is provided for them.

For FY 73, there are no major numerical changes programmed for strategic offensive forces, shown in the table below:

	FY 71	FY 72	FY 73
Strategic Offensive Forces			
Bombers:			
B-52 (UE) a/	435	397	397
FB-111 (UE) a/	66	66	66
Missiles:			
Titan II	54	54	54
Minuteman	1000	1000	1000
Polaris/Poseidon	656	656	656
Ballistic Missile Submarines (SSBN)	41	41	41
Active Military Manpower (000s)			
Navy	18	18	18
Air Force	70	70	71

a/ Unit Equipment (UE) is the basis for manning aircraft squardons. This is less than the Total Active Inventory (TAI).

D. Strategic Defense, Control and Surveillance Forces

1. Ballistic Missile Defense

The Safeguard Anti-Ballistic Missile Defense System has been and continues to be designed to achieve several objectives against a combination of Soviet and Chinese threats. These include:

-- "Protection of our land-based retaliatory forces against a direct attack by the Soviet Union.

-- Defense of the American people against the kind of nuclear attack which Communist China is likely to be able to mount within the decade.

-- Protection against the possibility of accidential attacks from any source."

We are requesting in FY 73 authority to proceed with the Safeguard deployment at four Minuteman sites, as well as continued development of Hardsite to augment the Safeguard defense of Minuteman if later required.

2. Air Defense

In FY 73 we will maintain air defense forces capable of limited damage in a crisis from deliberate or unauthorized small air attack, restricting the unauthorized overflight of U.S. airspace, and defending the National Command Authority. However, the composition of the air defense forces to carry out these missions will change somewhat during FY 73. We will transfer additional active interceptor squadrons to the Air National Guard in keeping with the total force concept, and we plan reductions in both BOMARC surface-to-air missiles and the Back-Up Interceptor Control (BUIC) sites.

3. Missile Warning and Space Systems

Early warning of ICBM attack will continue to be provided by the Ballistic Missile Early Warning System (BMEWS) radars and the "forward scatter" Over-the-Horizon (OTH) radar system. The 474N system will give improved early warning of SLBM attack due to the addition in FY 72 of a long-range radar along the east coast. Development of the satellite early warning system is underway. This advanced system will provide early warning of ICBM, SLBM, and Fractional Orbit Bombardment System (FOBS) launches and will greatly improve the overall capability of our warning network, especially against both ICBM and SLBM launches.

Satellite tracking and identification will continue to be provided by the existing USAF Spacetrack system and the Navy's SPASUR system, both tied into the North American Air Defense Command and supported by the Space Defense Center for continuous space cataloguing.

4. Command and Control

To provide a much needed improvement in Naval and Air Force communications, and to strengthen the survivability and flexibility of our control and communications to the strategic bomber and SLBM forces, we have initiated in FY 73 a new communications satellite program for air and sea-mobile users - FLEETSATCOM.

In FY 72 funds were allocated to increase the survivability of our airborne VLF communications relay to the SLBM element of our strategic retaliatory force by putting fleet communications aircraft (TACAMO) on airborne status. In addition, we anticipate that in FY 73 improved TACAMO capabilities and changes in operation and deployment will further improve system performance and survivability.

The programmed forces and manpower for the strategic defensive, control and surveillance missions are shown below:

	FY 71	FY 72	FY 73
Strategic Defensive, Control and Surveillance Forces			
Interceptor Squadrons			
Active Air Force	11	9	7
Air National Guard	16	18	20
Surface-to-Air Missile Batteries			
Active Army	21	21	21
Army National Guard	27	27	27
Active Air Force	5	5	0
Active Military Manpower (000's)			
Army	6	7	7
Navy	1	1	1
Air Force	34	33	30

E. Manpower Requirements for Strategic Forces

The manpower required by each Service for the strategic forces discussed above is presented in this section. In addition, a more detailed view is provided of the components of the strategic forces for each Service, and the methodology the Service uses to compute the manpower required for those components is discussed.

1. Air Force Manpower Requirements

a. Air Force strategic offensive forces are a mixture of combat aircraft and intercontinental ballistic missiles assigned to the Strategic Air Command (SAC). SAC's primary mission is to prevent nuclear war through its ability to deliver this nuclear firepower to any part of the world, even if subjected to surprise attack. SAC also has the capability of delivering conventional (non-nuclear) weapons with its aircraft. To perform these missions, there are 26 B-52 squadrons composed of 397 unit equipment (UE) aircraft; 4 FB-111 squadrons composed of 66 UE aircraft; Hound Dog and Short Range Attack Missiles; 38 KC-135 tanker squadrons with a UE of 615 aircraft; 6 Titan missile squadrons with a UE 54 missiles; and 20 Minuteman squadrons with a UE of 1,000 missiles.

Strategic offensive force manpower includes the crews as well as the organizational and field maintenance personnel (depot maintenance is included in the Logistics category), weapons system security personnel, and munitions maintenance personnel required to support the weapons systems. Force manpower also includes the personnel required to man the necessary command posts and mission planning functions of the squadrons and wings. Finally, it includes the remainder of the squadron and wing staffs who perform such functions as staff intelligence, unit training, flying safety, command and administration. See the Tactical Air Forces section for a description of how the manning factors are derived.

b. Strategic defensive forces contain the aircraft and missiles in the Aerospace Defense Command and Alaskan Air Command, supported by the Air National Guard as well as the ground environment systems. These forces are required for the defense of the North American Continent and certain overseas land areas against any aerospace threat. To perform this mission there are 7 F-106 squadrons; 2 EC-121 squadrons; and 10 F-102 squadrons, 4 F-106 squadrons, and 6 F-101 squadrons in the Air National Guard (ANG). The ground environment systems include 3 NORAD Manual Control Centers in Alaska and one in the CONUS, 99 Surveillance Radar sites, of which the Air Force mans all but 26 located in Canada, and 31 Distant Early Warning (DEW) stations primarily manned by contractor personnel.

The manpower for defensive forces includes the crews, the organizational and field maintenance personnel (depot maintenance is included in the Logistics category), weapons system security and munitions maintenance personnel required to support the aircraft and missile weapons systems. For the ground environment systems, manpower is required to operate and maintain authorized equipment as well as to perform some 60 functions directly associated with the system. For example, in the case of surveillance radar, manpower is needed to perform the following functions: command, administration, radar operations, radar maintenance, radio maintenance, crypto maintenance, refrigeration/air conditioning maintenance, heating systems maintenance, etc. Personnel are also required to man the wing and squadron staffs as discussed in the offensive forces section.

c. Strategic control and surveillance forces are a mixture of strategic offensive and defensive detection, tracking, control, communications and surveillance systems. Although the equipment and manpower for these forces are addressed separately, they are an integral part of our offensive and defensive forces. Control and surveillance (C&S) forces consist of the following aircraft: 1 squadron of SR-71s for reconnaissance; 29 Post Attack Command and Control System (PACCS) aircraft which are used by the Strategic Air Command for airborne command posts, communication relay, and launch control centers, and will take charge should SAC ground facilities become inoperative; and 3 EC-135 aircraft which are the National Emergency Airborne Command post aircraft located at Andrews AFB. The ground environment includes the NORAD Combat Operations Center in Cheyenne Mountain near Colorado Srings which is the nerve center for air defense of the North American Continent; 3 Ballistic Missile Early Warning sites; 8 Submarine Launched Ballistic Missile Detection and Warning sites; 7 SPACETRACK sites consisting of radars and Baker-Nunn cameras, including the FPS-85 phased array radar at Eglin AFB; 9 Over-the-Horizon Radar sites with transmitters in the Pacific and receivers in Europe; the ground data system for the satellite early warning program and portions of the national military command and control system. Finally, C&S forces include communications and command and control support equipment associated with the Strategic Air Command forces.

The C&S manpower is varied because of the numerous one of a kind systems identified above. The manpower associated with the aircraft is based on force levels and activity rates. The ground environment manpower requirements generally are based on equipment authorized and positions which must be manned. However, there are many complications, such as contractor support, internal support, and climate.

Illustrative of the types of functions which are performed by C&S personnel is the operation of the Eglin AFB FPS-85 phased array radar. Radar operations functions include, but are not limited to: computer operations and maintenance; satellite object identification and analyses; radar operations and maintenance; communications operations and maintenance; and refrigeration/air conditioning.

d. Air Force manpower required for strategic forces is shown in the table below along with the TOA for FY 73:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
104	104	102	4.5	22%

NOTE: Throughout the Report, "% MILPERS" represents the amount of the Military Personnel appropriation divided by the TOA amount shown in the table.

The strategic manpower totals shown above represent the number of personnel directly employed in carrying out the strategic mission. There are, however, additional Air Force personnel who support the strategic mission, but are accounted for in General Support manpower programs. These support personnel provide supply support to strategic field maintenance units and food, transportation and military police services. The Army and Navy normally include these personnel in their strategic-direct mission manpower totals.

2. Navy Manpower Requirements

a. Navy strategic offensive forces consist primarily of the 41 Polaris/Poseidon ballistic missile submarines and their 5 supporting tenders. Also included are support personnel who provide technical assistance, material support, and program management.

The ships are manned on the basis of the operating, maintenance, and administrative workloads to which Navy manning criteria are applied. The resulting manpower requirements are expressed in Ship Manning Documents (SMD) for each class of submarine and tender. The development of these SMDs is discussed in detail in the presentation on Naval Forces. For an SSBN, the standard manning is 26 officers and 248 enlisted men (13 officers and 124 men in each of two crews for an SSBN). Manning levels are also provided for ships in overhaul and conversion since a portion of the planned work is accomplished by the crew.

Given these standard factors, the manpower requirements for strategic forces are computed as follows:

Type of Ship	Average Manning Factor	No. of Units	Total Manpower (Thousands)
SSBN	263 a/	41	10.8
Tenders (AS)	1,161	5	5.8

a/ Includes active ships and those in overhaul/conversion. For active ships only, the manning is 274.

Additional personnel are needed to man the support craft (e.g., floating drydocks) and other related activities (e.g., Atlantic Fleet Polaris Material Office).

b. Strategic control and surveillance forces consist primarily of 9 SPASUR sites and 12 TACAMO aircraft (EC-130G).

c. Navy manpower and TOA required for strategic forces is shown in the table below:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
19	19	19	2.4	6%

3. Army Manpower Requirements

a. Army strategic defensive forces consist of CONUS Air Defense forces, the Office of Civil Defense, and the SAFEGUARD system now being developed and deployed. They provide surface-to-air missile units, and supporting facilities to assist in the defense of the United States against hostile air and missile attack. Included are the United States Army Air Defense Command (ARADCOM) NIKE HERCULES batteries (21 active and 27 Army National Guard units), command and fire coordination centers, and the developmental elements of the SAFEGUARD system.

The manpower needs of these forces are arrived at by first determining the number of operating positions needed in each firing unit. Using a standard work week, the number of men needed to operate the system on a continuous basis is calculated. In a similar way, engineering standards are used to estimate the number of maintenance manhours the system will require. These factors are then translated into numbers of men. Finally, using standard factors based on experience, the required numbers of administrative and support personnel (e.g., cooks, clerks) are determined. The sum of these calculations is the manpower requirement for the unit. This number is then set forth in a Table of Organization (TO) which is the official Army manpower authorization document. TO's are periodically audited and reviewed to insure that the original estimates (in the case of new kinds of units) are valid. For example, a TO of a NIKE HERCULES firing battery with 12 launchers consists of the following:

AIR DEFENSE FIRING BATTERY - CONUS

Functional Area	Manpower Spaces
Battery Headquarters	16
Fire Control Platoon	47
Launcher Platoon	58
Security Section	13
Battery Total	134

Additional personnel are needed to man command and fire coordination centers and to provide system-wide supervision.

b. Army manpower required for strategic forces is shown in the table below:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
6	7	7	1.7	4%

General Purpose Forces

The role of our General Purpose Forces is, together with the forces of our allies, to deter war and to defend if conflict occurs. Ready and deployable General Purpose Forces in peacetime have significant value in deterring war. The size and mix of General Purpose Forces are predicated upon two policy judgments which have been in effect for many years. These policies are: (1) that the security of the U.S. and protection of our vital interests require forces for forward deployment and forward defense; and (2) that strategic nuclear forces, in and of themselves, cannot be relied upon to provide a credible deterrent or a reasonable response to the entire spectrum of aggression which we must be prepared to face.

Our General Purpose Forces are sized so that the United States will be prepared for an initial defense of NATO Europe or a joint defense in Asia against PRC backed aggression, and to assist allies in Asia against a non-PRC attack, while providing forces for a relatively minor contingency and for a strategic reserve. In our force planning, we do not attempt to build forces to meet all of these possible contingencies or to become engaged in numerous different areas simultaneously. By sizing our forces to meet certain major threats, we expect to be able to handle lesser threats with the same forces. The two major areas of concern, and of greatest potential threat, are in NATO and Asia.

A. The Threat in Europe and Asia and U.S. Conventional Strategy to Meet It.

1. NATO

Our NATO commitment to the common defense of Western Europe is one of the most significant factors in determining the size of our land and tactical air forces. Based on extensive analysis, three successive Presidents have concluded that a conventional defense of Western Europe against a full scale conventional attack by the Warsaw Pact is essential to our own security interests. Such a defense becomes feasible only with substantial numbers of U.S. forces stationed in Europe, backed up by reinforcement and resupply capability.

The USSR and other Warsaw Pact forces facing NATO are maintained in forward areas with forces immediately ready for combat. These forces are designed to blunt a NATO attack and then seize the initiative. Additional objectives are the maintenance of Soviet influence in Eastern Europe and keeping political pressure on Western Europe. While these forces pose a substantial military threat to NATO, a war is not presently considered likely in Europe. This is based on our assumption that the Soviets are

deterred from attacking NATO because the present size of NATO's conventional forces is sufficient to require that any conventional attack by the Warsaw Pact be a large, mobilized attack. And even after mobilization by both sides, the conventional combat capability of NATO appears roughly commensurate with that of the Warsaw Pact. Given this situation, the Pact military commanders should not have reasonable confidence of attaining their objectives by conventional force or by threat of conventional force. U.S. strategic strength insures that the Soviet Union would have no incentive for launching a first strike against the United States in order to attain objectives in Western Europe or anywhere else. So, across the spectrum of warfare - conventional to strategic - the U.S. and its NATO Allies possess the forces adequate and appropriate for deterring various threats of aggression.

a. The Warsaw Pact Threat

While we do not consider aggression by the USSR likely in the present political climate, the fact remains that the Soviets have a vital interest in preserving the status quo in Central Europe and in retaining their hold on Eastern Europe. A crisis that could lead to a conflict could arise if the political situation substantially changed in a way which threatened the USSR or its hegemony over Eastern Europe, or if a Soviet government saw opportunities for other ways to apply critical pressures on the cohesion of the Alliance. Such a crisis could escalate to hostilities.

Whatever the immediate cause, the crisis could trigger localized hostilities or mobilization by the Pact and NATO. Even at that state, both sides might desire to avoid or extinguish any hostilities.

b. NATO Conventional Defense

NATO, with the current U.S. contribution, has a major conventional capability. This capability is being enhanced significantly by the force improvement actions now being undertaken by each of the NATO countries.

If NATO is to deter the Warsaw Pact from judging that offensive military action, or the threat of such action, is an attractive option during a period of political crisis, the NATO peacetime forces must possess a total capability to provide an effective defense. As long as there is no overall imbalance in strength between the two opposing sides, the Warsaw Pact cannot realistically assume that the initiation of hostilities is an attractive means of achieving some political objective. The current deployment of NATO forces is considered adequate to deny the Warsaw Pact high confidence that a Pact attack in the Central Region[1] would be successful. Finally, the Soviet Navy provides the USSR with the capability to support Soviet initiatives on the northern and southern sea flanks of NATO and to threaten the vital sea lanes to Western Europe. Our two deployed carrier task forces provide a viable deterrent to this Soviet naval threat in the Mediterranean.

1/ The Central Region consists of West Germany, BENELUX, France, and the United Kingdom on the NATO side, and East Germany, Poland and Czechoslovakia on the Pact side. The "Southern Flank" of NATO is comprised of Italy, Greece, and Turkey, while the "Northern Flank" is the Scandinavian countries.

c. U.S. and Allied Cooperation in NATO

The past year has been one of considerable stability in Europe, and of the expansion of cooperation within the NATO Alliance. The Alliance defense has been put on its most solid footing in many years, as a result of the NATO Alliance Defense Study (AD-70) efforts, the desire of the Europeans to show that they are definitely shouldering more of the NATO defense burden, and our own efforts to improve the readiness of our forces in Europe. The Total Force Planning Concept is working in NATO. In addition, NATO has considered a number of diplomatic initiatives toward detente in Europe. The most prominent of these has been MBFR (Mutual and Balanced Force Reductions). The Department of Defense has played an important role in the U.S. and NATO studies and discussions of MBFR, given the special and unique responsibility of Defense Ministers for assuring that our common security is safeguarded.

That our efforts have been reasonably successful in the past year is, however, no reason for complacency. The common coordinated force improvement must be sustained, because we see no slackening of Warsaw Pact defense efforts.

The NATO AD-70 study moved from the phase of study into the phase of implementation this past year. Ministers of Defense endorsed the priority areas which had been proposed to them for the further implementation of AD-70 recommendations. Both U.S. and Allied improvements are to be directed into these areas. During the next year, we will continue our discussions of the most efficient and cooperative ways to introduce improvements in these areas into NATO forces. The U.S. has taken several important initiatives in this regard, especially in electronic warfare and maritime surveillance capabilities.

d. Negotiations

On MBFR we have, together with our NATO Allies, stressed the critical need for insuring that MBFR continues to receive the most searching examination possible within our respective governments. We are determined that Allied decisions on MBFR be based on thorough preparation and full consultation. Our common purpose in MBFR must be to maintain the security of the Alliance and enhance the stability of the military situation in Europe. We are considering in our studies a combination of reductions plus constraints and verification provisions, which, arrived at through a carefully phased negotiation, may in fact be the key to an acceptable approach.

e. Burden Sharing

While the primary burden-sharing efforts in NATO are directed toward mutual improvement of our military forces, we have also recently concluded a very satisfactory offset agreement with the Federal

Republic of Germany. The agreement will cover fiscal years 1972 and 1973, and will amount to more than $2 billion over the period. In establishing this amount, the particularly large separate German contribution to the $1 billion European Defense Improvement Program (EDIP) was taken into account. A key new element of the agreement is a program for the rehabilitation of barracks and other facilities used by U.S. forces in Germany. Germany will make available over $180 million for this program.

We also welcome the recent agreements on exchange rates which we have reached with our major Allies. This should permit a more stable economic relation between us and alleviate U.S. balance of payments problems.

f. Allied Improvement Efforts

Our NATO Allies are fulfilling their end of the bargain whereby the U.S. would maintain and improve its forces in Europe given a similar approach by them.

The EDIP program of $1 billion over five years, announced in December 1970, is being rapidly implemented. Over two-thirds of the total program of aircraft survival measures (i.e., shelters and other facilities) is already the subject of definite NATO programming or implementation action. Action on all special national force improvements and the $79 million inter-alliance aid project announced as parts of EDIP are also going ahead on time.

But EDIP is only a small part of the total European contribution to the Alliance. For the year 1972, almost all of our Allies are planning significant increases in their defense budgets. At current prices the total planned increase for 1972 is over $1 billion, without counting certain likely supplementary budget appropriations to meet further rises in costs. Our Allies in the last few years have also taken important steps to modernize the structure and equipment of their forces. Many of these steps are in consonance with the priorities established in the AD-70 study, and the Allies are also engaged in re-examining and where necessary, re-shaping their ongoing defense programs to fit those priorities. In any case, they have important programs for the modernization of their forces.

Our Allies have made clear that the maintenance of their force levels and their extensive improvement programs are worthwhile because of the continued U.S. commitment to NATO defense, given the high quality of U.S. forces, the critical part they play in NATO defense plans, and their link with U.S. nuclear deterrent power. Our Allies have also made clear that efforts to achieve sufficient defense capabilities is a necessary corollary to realistic negotiations on security and cooperation in Europe.

g. Improvements to U.S. Forces in Europe

The U.S. is also making a strong effort to maintain and improve its forces in Europe. During the past several years, manpower shortages and personnel turnover have caused readiness problems for U.S. forces in Europe. In the past year, we raised the priority of our European forces for personnel, and the units are now close to 100% of authorized manning. Perhaps of even greater importance is the fact that the turnover of personnel in our Army units will ease in FY 73, thus reducing turbulence. In addition, we are taking steps to improve combat readiness of U.S. units in Europe through increased training, enhanced equipment maintenance, and better facilities.

Modernization of the equipment of U.S. forces is also progressing well. In the first instance, we are making significant improvements in our anti-armor capabilities. The TOW anti-tank guided missile is being introduced in significant numbers now, and the smaller DRAGON missile will follow. We plan to introduce the M60A2 tank with stabilized guns and SHILLELAGH missile launchers with a new laser range finder. We will equip two Armored Cavalry Regiments with additional M-551 SHERIDANS, also equipped with the SHILLELAGH missile. Our program to replace gasoline-powered armored personnel carriers with new and improved diesel models is nearing completion. We plan to deploy the LANCE missile to Europe as scheduled.

As for our tactical air forces, we have about completed conversion of F-100 aircraft to F-111 and F-4. We have already built over 300 aircraft shelters and should finish the program with over 400 by the end of calendar 1972. We are steadily increasing logistics stocks and improving unit manning. The same kind of progress applies to our electronic warfare capability. Finally, we hope to decrease force vulnerability by increasing the number of available dispersal bases and thus reduce wartime air base loading.

2. Asia

The United States is a Pacific power, and as such must recognize and accept its responsibilities in the area. We seek to do so as a partner, as one of a group of concerned nations acting in concert. It is our objective to support our allies and fulfill our treaty commitments in the context of the Nixon Doctrine.

We do not plan for the long term to maintain separate large U.S. ground combat forces specifically oriented to the Asian theater alone, but we do intend to maintain strong air, naval and support capabilities. To serve as a deterrent and to support our allies, we continue, of course, to maintain balanced, forward deployed ground, air and naval forces in the Asian theater. However, we expect to continue to emphasize the strengthening of the military capabilities of our friends and allies, as we move toward Nixon Doctrine peacetime deterrent forces.

In Asia it has been our policy to seek progressively to develop the capability and commitment of Asian allies to assume a greater share of deterrence and defense against enemy attack. Our primary objective is to help our allies develop and maintain the capability of defending themselves against both internal and external threats. To date, the total force concept is progressing in Asia, as it is in NATO. Our Asian allies are doing more for themselves as envisioned in the Nixon Doctrine, and they are contributing more heavily. The U.S. effort in assisting our allies is directed toward the following goals.

-- Assure allied capability to control insurgency.

-- Assure allied ground capability to defend against non-PRC threats.

-- Assure allied air and naval capability to defend against non-PRC threats.

-- Increase allied capability to contribute ground forces for defense against PRC threats.

In broad terms, the present security situation in Asia looks like this:

a. In Northeast Asia

(1) The Threat. The North Koreans appear committed to a strategy of developing a "revolutionary struggle" in the South. The primary danger in this area is that major hostilities might result from miscalculation or overreaction in an increasingly tense situation.

(2) Meeting the Threat. Our security assistance investment is being amply repaid, as the Koreans have made good progress in improving their armed forces, particularly the ground forces. Problems do remain, and the South Koreans continue to require our material assistance. The South Korean air force, with such old planes as the F-86, is on the verge of obsolescence. We, therefore, are asking the Congress to support continued security assistance to South Korea.

b. In Southeast Asia

(1) The Threat. (This addresses only the threat in the mid and late 70s, after Vietnamization has been completed.)

The situation in Southeast Asia in the 1970s is much more difficult to predict and U.S. force requirements are a good deal less certain because:

-- The threat is believed to be logistically constrained in Southeast Asia, but the road capacity to move supplies is uncertain.

-- The level of insurgency we can expect is not known. It is estimated that insurgency levels which do not receive significant foreign support should be within the capabilities of our allies using police forces and militia alone.

(2) Meeting the Threat. Because of environmental conditions and the limited land LOC, a conflict in SEA probably would not involve the continuous-front warfare anticipated in Europe. Military operations would more likely be carried out with relative independence over a broad area and concentrated in only a few canalized routes. In many areas, the opposition may include guerrillas as well as enemy forces, with no secure rear areas and no clearly defined lines of contact. The possible range of U.S. and allied forces required to meet specific contingencies is too broad to make meaningful estimates at this time.

c. U.S. Forces for Asia

We currently plan forces to provide materiel, logistics, and intelligence support, and backup tactical air and naval support for our Asian allies. We plan only a limited backup ground force capability for non-Chinese, non-Soviet supported contingencies. We also maintain the capability to assist our allies against a PRC attack with conventional forces in Asia provided we are not fighting in Europe. In the event of a conflict in Asia, we would draw on those forces in CONUS maintained either for a NATO conflict or as part of our unallocated strategic reserve, if needed. By calling Reserve and Guard forces to active duty, we would rebuild our capability to meet our NATO commitment. In broad terms, therefore, our long-term policy places more reliance upon our allies, and does not require us to support large U.S. ground forces earmarked solely for Asia.

3. Sub-theater Conflict, Contingencies, and Strategic Reserves

We must face the prospect that conflicts running from localized insurgency or guerrilla warfare to the type of conventional attack which North Korea itself could mount against South Korea will continue to threaten the security of our friends and allies through the 1970s. We classify such potential conflicts separately from large-scale conflicts directly involving the Soviet Union and the Warsaw Pact, or the PRC. Such a distinction between theater and sub-theater conflict may be considered artificial by some, particularly in the case of an intense localized conflict such as the war in Southeast Asia. It is important, however, because under the Nixon Doctrine, as exemplified by the Vietnamization Program, we believe that our allies can and must increasingly bear the primary burden for planning to cope with sub-theater and localized conflicts.

However, as we move in this direction under President Nixon's Strategy for Peace, there may be situations where only U.S. capabilities would provide the flexibility of action which may be necessary in the future. Therefore, in addition to the forces required for a NATO or Asian conflict, we also maintain added forces for limited contingencies elsewhere in the world. This force also provides a hedge (a strategic reserve) should the actual force requirements for theater conflict exceed those we estimate would be required. We also maintain certain special mission forces for specific needs in selected areas.

B. Land Forces - Forces, Capabilities, Missions, and Manpower

1. Summary of Forces

Land forces manpower and the number of divisions manned for FY 71-FY 73 are shown below:

LAND FORCE LEVELS

	End-FY 71		End-FY 72		End-FY 73	
	Div	Support Increments	Div	Support Increments	Div	Support Increments
Army						
Active						
Deployed	8	13 1/3	5 2/3	8 2/3	5 1/3	8
CONUS/Hawaii	5 2/3	6	7 1/3	6 1/3	7 2/3	6
Reserve	8	24	8	27	8	27 2/3
Total Army	21 2/3	43 1/3	21	42	21	41 2/3
Marine Corps	Div. Forces		Div. Forces		Div. Forces	
Active						
Deployed	1		1		1	
CONUS	2		2		2	
Reserve	1		1		1	
Active Military Manpower (000)						
Army	562		432		435	
Marine Corps	74		78		79	

By the end of FY 72, the active Army force structure will consist of 13 active division equivalents: 3 armored, 4 mechanized, 2 2/3 infantry, 1 1/3 airmobile, 1 airborne, 1 tricap division, and division-size

support increments. In addition, six separate special mission and school brigades and three armored cavalry regiments will be in the active Army. The Marine Corps will have three active divisions and three active wings. Reserve land forces will include eight National Guard divisions and one Marine Corps Reserve division. Additionally, there are 25 separate Army Reserve brigades and regiments which provide roughly the equivalent of 1/3 division each. The above forces, excluding the separate brigades, combine to form total U.S. land forces of 25 divisions (21 Army and 4 Marine) at the end of FY 72, compared to 31 2/3 at the end of FY 69, the height of the Vietnam War.

By the end of FY 72 we will have completed the planned reduction in major land forces from their levels at the Vietnam peak. The end-FY 73 force structure will be the same as at end-FY 72, with the exception of one less active support increment and one less separate brigade.

The force structure described above, while austere, should suffice to implement the Nixon Doctrine and the national security strategy of realistic deterrence in the foreseeable future, provided that: (1) we succeed in increasing the capability of our Reserve and Guard forces; (2) we continue to increase the capability of both Active and Reserve forces through planned modernization programs; (3) our allies continue to improve their forces; and (4) sufficient warning is achieved and mobilization is effected.

2. Capabilities of Land Forces

Two of the major land forces categories are division forces and special mission forces. The Army division forces are the combat divisions and additional units required within a theater of operations to support the sustained combat operations of the divisions. These division forces are the deployable expeditionary forces of the Army designed to provide the bulk of combat power for a land war. For planning purposes the size of an individual division force is set at 48,000 structure spaces. Each division force is separated into a division and two support increments; some of the support increments are in the Reserve Forces. A division contains about one-third of the manpower in a division force and the support increments about one-third each. Marine divisions, augmented with combat support and combat service support units from the force troops, are the basic ground elements of the Marine Amphibious Forces (MAF's), integrated air/ground teams.

a. Army Divisions

The division is a major administrative and tactical unit which combines in itself the needed arms and services required for sustained combat. It consists of about 16,000 men. U.S. Army land forces contain the following types of divisions:

(1) Armored and Mechanized Divisions

These divisions have the most tanks and anti-tank weapons which are important to counter the armor-heavy forces of the Warsaw Pact. They also have great battlefield mobility, important in a NATO war. Mechanized forces have also been used in Asia. At end-FY 73 the U.S. will have 4 1/3 mechanized divisions and 3 armored divisions. Of the total 7 1/3 divisions, 4 1/3 represent our peacetime deployments in Germany, with the rest in CONUS: one in Texas, one in Colorado, 2/3 in Kansas, and 1/3 in Georgia.

(2) Infantry Divisions

These divisions have much less anti-armor capability than mechanized and armored divisions, and fewer vehicles. They can operate in more difficult terrain, and require less transport to deploy than the heavy divisions. At end-FY 73 the U.S. will have two and two-thirds infantry divisions.

(3) Airmobile Division

The airmobile division is roughly an infantry division with helicopter mobility. It is best for controlling large land areas against relatively unsophisticated enemies and because of its high tactical mobility would be useful in NATO. At end-FY 73 the U.S. will have one airmobile division. The division is stationed in Kentucky.

(4) Airborne Division

The airborne division is capable of parachute assault, which makes it the most lightly equipped and most quickly deployable division in the Army. The 82nd Airborne Division in North Carolina is the primary quick reaction Army force at the President's disposal.

(5) Tricapability Division

The Army will have one tricap division stationed in Texas in FY 73. This is currently an experimental division which combines armored and mechanized capability with that of airmobile infantry and air cavalry. The testing being performed will indicate whether the airmobile capability developed in Southeast Asia can be effectively used in conjunction with mechanized and armored forces for the defense of NATO.

b. Army Support Increments

Most non-divisional units in division forces are of battalion size or smaller, but are aggregated to division size increments for planning. The support increments contain both combat and support units.

(1) Combat Units

Although most of the combat power of the division force is found in the division itself, the support increments also contain substantial combat forces, such as armored cavalry regiments, independent artillery battalions, surface-to-surface missile battalions, separate air defense batteries, and helicopter combat units. The reserve support increments contain separate brigades and armored cavalry regiments.

(2) Support Units

The support units of a division force provide the capability to support the combat units in sustained combat operations. These units provide engineers, communication, maintenance, ammunition and fuel supply, military police, and the many different kinds of personnel services required to sustain combat forces. Some of the support increments for the active Army are in the National Guard and Army Reserve and not in the active Army. This is possible because fewer support units are required to support the initial stages of combat. Reserve support units can train and deploy much faster than can reserve divisions.

c. Marine Divisions

The Marine division, as a part of a MAF, has the capability to make forced entry amphibious assaults. Two of our MAFs can be tailored for immediate commitment to high intensity combat to provide this capability. The third active MAF, or elements thereof, would be available simultaneously for immediate commitment to meet the requirements for minor contingency operations worldwide and to provide assistance to allies as required. In FY 73 we will have three active Marine Divisions. One division, the ground combat element of II MAF is located in North Carolina. Battalion landing team (BLT) size elements of this division are forward deployed continuously to Guantanamo Bay, Cuba and with afloat air/ground task forces in the Mediterranean and Caribbean. Another division, the ground combat element of I MAF is located in California. The third division, the ground combat element of III MAF, is located in the Pacific Ocean area (Okinawa and Hawaii). Two BLT size elements of this division are afloat continuously in the Western Pacific.

d. Special Mission Forces

Special mission forces make up the other principal category of land forces. These include units tailored for such missions as initial defense of the Panama Canal, Alaska, and Berlin. They also provide surface-to-surface and surface-to-air missile support in Europe and the Pacific and the defense of CONUS and Alaska against enemy air attack.

e. Combat to Support Balance

We recognize the importance of achieving an optimum balance of support troops to combat troops consistent with combat requirements. In FY 73 the programmed Army forces will move towards a lower ratio of support to combat forces. An indicator of the emphasis placed on combat power within active division forces can be obtained by examining the number of divisions and support increments in the active forces. The table below shows the breakdown of divisions and support increments from FY 70 to FY 73:

SUMMARY OF ACTIVE ARMY DIVISION FORCES

	FY 70	FY 71	FY 72	FY 73
Divisions	17 1/3	13 2/3	13	13
Support Increments	27 1/3	19 1/3	15	14
Percentage of Divisions in Division Forces	39%	41%	46%	48%

The percentage of the force that is made up of divisions is shown continually increasing from 39% in FY 70 to 48% in the FY 73 baseline force, reflecting an increasing emphasis on combat power in the active division forces for this time period.

A further measurement of the relative emphasis the Army places on combat power is the ratio of total Army manpower to the number of divisions. This ratio is shown below:

RATIO OF ARMY MANPOWER TO NUMBER OF DIVISIONS

		FY 70	FY 71	FY 72	FY 73
Ratio:	$\frac{\text{Total Army Manpower}}{\text{Number of Divisions}}$	76,300	82,200	66,200	64,700

Although the ratios above are at a very aggregate level, they do reflect that in our land forces the proportion of combat units increases as the Army returns to a peacetime footing and relies more heavily on Reserve backup for support forces. A more complete discussion of the entire combat/support issue is included in Chapter V.

3. Regional Missions for Land Forces

a. NATO

The most demanding contingency for U.S. land forces is in NATO Europe. Our land force requirements are largely determined by planning for U.S. and allied conventional forces which, after a period of warning and mobilization, would be able to defend NATO Europe against a conventional attack by the Warsaw Pact. We plan to continue in FY 73 land force deployments to Europe at their FY 72 level of approximately 199,000, as follows:

Combat Forces	
4 1/3 Divisions	65,000
2 Armored Cavalry Regiments	6,000
Berlin Brigade	3,000
Other Combat Units a/	17,000
Missile Forces	15,000
Total Men in Combat Units	106,000
Support Forces	
Units Supporting Divisions	71,000
Strategic Communications, Intelligence, and Security	11,000
DOD/Joint Activities, Free World and Other Services Support, and Others	11,000
Total Authorized Army Strength	199,000

a/ Artillery, Combat Aviation, and Combat Engineers.

In the event of a major conflict with the Warsaw Pact we plan on deploying many of our active divisions. The length of the NATO frontage to be defended, the European terrain and road network, and the size and high degree of mechanization in Pact forces all combine to make possible rapid advances by attacking forces. For this reason, the early arrival of large U.S. reinforcements is critical to a successful defense of NATO Europe.

b. Asia

We do not plan for the long term to maintain separate large U.S. ground combat forces specifically oriented to Asia. If a large land war involving the U.S. should occur in Asia we would be prepared to mobilize, and would initially use our non-NATO-committed forces and, if required, portions of the forces based in the U.S. and earmarked for NATO. In the future, we expect the emphasis in Asia more and more to be placed on U.S. support to our allies who themselves will provide the required ground forces manpower.

4. Determination of Manpower Requirements

Based on the forces and missions described above, the Army and Marine Corps determine manpower requirements for those forces as follows:

a. Active Army

Active division forces consisting of 13 divisions and 14 support increments would have a wartime strength of over 400,000 men and would receive the support of additional reserve support increments with mobilization.

The manning level of each unit will vary and is determined by the mission of that unit and the readiness needed to fulfill that mission, given the unit's peacetime location. Under current readiness concepts a division is available to load for deployment after personnel and equipment fill, training, and packing. Availability of divisions for deployments is a function of peacetime manning level. Manning combat units at less than 90% significantly restricts the amount of training the unit can carry out in peacetime.

As was stated earlier, the principal requirement for U.S. land forces is the initial defense of NATO. We plan on the assumption that there would be a few weeks of warning time before a NATO war started. Thus our forces stationed in Europe are manned to allow them to be substantially ready for combat.

Because support units are smaller than divisions and generally require less time to get ready, and further because many support units do not have to be deployed until some time after the division is deployed, the average manning for support increments is slightly lower than for divisions. Depending upon the size of the unit involved, certain units within the 16,000-man support increment may be manned at higher than 90%. and some at lower. Support units which are not needed in the early stages of mobilization are in the Reserves. All Reserve Component units are manned at 98% in peacetime.

The table below summarizes the active Army manpower and TOA required for land forces:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
562	432	435	7.0	53%

b. Marine Corps

In general, Marine Corps manpower requirements are based on:

(1) The approved force level; that is, the structure which is to be manned. For the Marine Corps, this consists of the three Divisions, three Wings, and two force troops commands which provide combat, combat support, and combat service support units.

(2) The number of manpower billets required in each of the units which make up the major forces authorized. This is determined by the operational capability required, and is related to the equipment necessary to perform the tasks or missions which are envisioned.

Military manpower requirements are not based on a fixed standard work week, but on operational requirements to achieve the mission capability of that unit. As part of a continuous review of manpower needs, a major task analysis study for all occupational fields is currently in progress to update manpower needs in relation to job requirements. This study is serving to better identify manpower requirements and training requirements.

The manpower requested for the Marine Corps in FY 73 would permit a manning level worldwide for the Fleet Marine Force which will make these units substantially combat ready. The manpower required by the Marine Corps for land forces is:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
74	78	79	1.0	61%

C. Tactical Air Forces - Forces, Capabilities, Missions, and Manpower

The threat discussed earlier poses a wide range of potential conflict situations in which military response might be required. The tactical air force structure described in this section provides to the National Command Authorities a variety of options, ranging from small, conventional deployments to large scale conventional and/or tactical nuclear operations. These forces are being structured to provide the responsiveness, positive control, and overall capability best suited to provide a wide variety of options to meet the requirements of our strategy.

The flexible nature of tactical air forces enables elements of the combat and supporting forces to be deployed as a package to meet threats to our national interests at the level of theater or subtheater conflict. These contingency force packages can be configured to expressly counter threats to our allies or for minor contingency situations where rapid reinforcement or force presence may be required.

1. Summary of Forces

In order to meet the tactical air portion of national strategy goals, the forces shown on the following page are planned for FY 73. Forces for FY 71 and FY 72 are shown for comparison. As can be seen in this table, all military assets are considered in force planning. For example, the Air National Guard and Air Force Reserve tactical aircraft are included in the table, and are an integral part of planned deployments for a NATO conflict.

U.S. TACTICAL AIR FORCES
(Authorized Active Inventory For End Fiscal Years)

	FY 71	FY 72	FY 73
Active			
Air Force Tactical Fighter Wings (TFW)	21	21	21 3/4
Air Force Reconnaissance Squadrons	14	13	10
Navy Fighter/Attack Squadrons	67	67	70
Navy Reconnaissance Squadrons	14	13	10
CVA/CVAN/CV	14	14	14
Marine Tactical Air Wings	3	3	3
Marine Reconnaissance Squadrons	3	3	3
Reserve			
Air National Guard Fighter/Attack Squadrons	27	33	36
ANG Reconnaissance Squadrons	11	6	6
Air Force Reserve Fighter Squadrons	0	1	3
Navy and Marine Corps Reserve Fighter/ Attack Squadrons	21	19	19
Active Military Manpower (000)			
Navy	60	60	65
Marine Corps	27	27	27
Air Force	79	80	75

2. Capabilities of Tactical Air Forces

Tactical aircraft have the capabilities to carry out a variety of missions in a conflict. These capabilities include close air support, interdiction, air defense (both fleet and area), reconnaissance, and special purpose missions.

a. Close Air Support

Close air support sorties are flown against enemy forces in close proximity to friendly forces. Primary goals of close air support are: (1) to destroy or neutralize enemy forces close to friendly forces; (2) to attack these enemy forces rapidly after requests for close air support; and (3) to attack other enemy targets near the front line which cannot be engaged by other means due to time, location, or other constraints. CAS systems should be able: (1) to deliver accurate, lethal fire; (2) to provide fire support responsive to the ground commander; (3) to survive in likely enemy air defense environments; (4) to maneuver well enough to employ proper tactics on various targets; and (5) to carry sufficient ordnance in quantity and variety.

b. Interdiction

On land, interdiction sorties (deep or strike -- Air Force and Navy) are flown against a wide range of targets, including (1) enemey forces maneuvering behind their front lines, (2) enemy lines of communication, (3) enemy air bases, and (4) storage and production facilities in rear areas. At sea, interdiction sorties are flown against enemy surface ships, such as surface-to-surface missile launching patrol boats and cruisers and surfaced submarines. Fighter escort sorties are provided in support of interdiction raids

c. Air Defense

Air defense sorties are flown to protect friendly air, sea, or ground forces from enemy air attack. These sorties provide defense of rear areas (depots, ports, lines of communication, troop staging areas, and air bases), troops on the front line (from enemy close air support), the Navy fleet, and convoys.

d. Reconnaissance

Reconnaissance aircraft provide surveillance of enemy activity through day and night photography, side looking radar, and infra-red imagery.

e. Special Purpose

Special purpose aircraft are used in electronic warfare (detection of and counter-measures against enemy electronic emitters), special operations forces (for example, specifically tailored for Southeast

Asia), tactical air control (enroute and terminal control of tactical aircraft), and airborne early warning (airborne search radar).

3. Missions of Tactical Air Forces and Employments

a. Missions

The mission of tactical air forces is to assist other forces in countering air, ground, and naval threats. For example, those portions of tactical air capability directed against the enemy's air threat are referred to as the counter air mission. This mission is primarily a combination of air defense capabilities with a portion of interdiction capabilities.

b. Employments

(1) NATO - Center Region

In the NATO center region, the Soviets have a numerical superiority in tanks. NATO has developed a substantial numerical advantage in ground attack aircraft that can assist in countering a Pact armored assault. Moreover, NATO ground attack aircraft possess better all-weather, range, and payload capabilities which could be used to advantage against Pact armored units to the extent that NATO tactical air forces can achieve local numerical parity or air superiority over the battle zone. The Warsaw Pact has developed a tactical air force with primary emphasis on air defense and combined this force with an extensive ground radar network complemented by anti-aircraft guns and surface-to-air missiles. Most of the center region U.S. tactical air forces would be provided by the Air Force.

(2) NATO - Flanks

The NATO flanks have generally not received as much analysis as the Center Region. The problem of the NATO Southern Flank (Greece, Turkey, and Italy) is compounded by the Middle East situation. Particularly in these areas, the mobility of our tactical air forces, including the carriers on the southern flank, provide the U.S. with the capability of meeting unexpected thrusts.

(3) Asia

Both the Air Force and the Navy would provide tactical air support for conflicts in Asia. Because of the limited number of land bases, the utility of carriers is enhanced. Other limitations include the distance for resupply and the possibility of conflict in two theaters, Northeast Asia and Southeast Asia. Tactical air provides the U.S. with the ability to provide rapid and significant support in Asian conflicts without involving substantial land forces. In addition, tactical air forces provide flexibility against the spectrum of conflicts possible in these areas.

(4) Sea Lane Protection

Our dependence on sea lines of communication necessitates their protection. The Navy, and to a lesser extent the Air Force, plan to provide tactical air for sea lane protection. The mission involves defending both military and support shipping from bombers with air-to-surface missiles and cruise missiles fired from surface ships and submarines. By using carriers and bases in both the U.S. and allied countries, U.S. tactical air can provide the defensive umbrella necessary to maintain the sea lines of communication essential in both NATO and Asian conflicts.

(5) Contingencies

The high degree of readiness maintained by the Marine Corps enhances its value in contingency situations. These forces could also be used in Asia or NATO conflicts. Marine Corps tactical air is an integral part of the Marine Amphibious Force.

4. Determination of Manpower Requirements

The tactical air forces described above represent a demand for manpower from the Air Force, Navy, and Marine Corps. The methods for determining the levels of manpower and the actual manpower required are as follows:

a. Air Force

To perform the tactical air forces mission there are 21 3/4 tactical fighter wings consisting of 72 squadrons; 10 reconnaissance squadrons; 11 special operations squadrons; various Air National Guard and Air Force Reserve aircraft; and, basically, three control systems.

Tactical air forces manpower includes the crews, organizational and field maintenance personnel (depot maintenance is included in the Logistics category), the weapons system security personnel, and the munitions maintenance personnel required to support these weapons systems. Also included are personnel required to man the necessary command posts and mission planning functions of the squadrons and wings. Finally, manpower is needed for the squadron and wing staffs which perform such functions as staff intelligence, unit training, flying safety, command and administration. In the case of the Overseas Air Weapons Control System, manpower is required to operate and maintain the radar equipment and control the aircraft for this system located in Europe. For the Tactical Air Control System and the Southeast Asia Tactical Air Control System manpower is required to operate and maintain assigned equipment as well as the Forward Air Control and Air Liaison Officers necessary to support Army and allied ground forces.

The manpower requirements for a tactical air wing are derived from a logical building block approach, starting with the individual aircraft and progressing through the squadron and wing levels. To illustrate how this is done, the following example for the A-7 aircraft is provided:

Crews: The crew composition of the A-7 is one pilot. The crew ratio is 1.1 per aircraft. Crew ratios are based upon: combat readiness requirements; sufficient capability to maintain aircrew proficiency required to accomplish the mission; lead time required to adjust or alter procurement and training of aircrews; operational requirements (type of aircraft and when flying, i.e., nighttime, daytime, 24-hour alert, etc.); and estimates of time lost due to sickness, leave, TDY, and other causes. The 1.1 crew ratio means that for a squadron composed of 24 aircraft, 27 pilots would be required in primary crew positions.

Maintenance: The key determinant in computing maintenance manpower requirements is the maintenance manhour per flying hour factor. This factor is developed by examining maintenance manhour data that are collected daily from each maintenance activity in the Air Force. The maintenance manhour per flying hour factor for the A-7 is 25 hours; i.e., it takes 25 productive direct manhours of maintenance to produce one flying hour. The maintenance manhour factor times the number of flying hours each aircraft must generate per month equals the total productive direct maintenance manhours that must be made available for each A-7 each month. To this must be added manhours for maintenance of the aerospace ground equipment (e.g., starters, generators, etc.) associated with the weapon system. On the average this requires an additional 15% of the maintenance manhours. The manhour requirement developed thus far pertains only to the worker or "wrench turner." It is also necessary to add a factor for maintenance supervision. This factor varies by weapon system and by deployment configuration but Air Force-wide the factor amounts to 10% of the manhours required to maintain the weapon system and the aerospace ground equipment.

The manhour requirements for maintenance, computed in the above manner, are converted to authorizations by dividing by the number of hours an individual is available for direct productive work in an average month. Air Force surveys have determined that an individual who is on a 10 hour shift, six days a week, is available for work 218 hours per month. 1/ This number excludes the time lost for sickness, leave, training, etc. Further, surveys have determined that he is directly productive, doing actual "wrench turning," 60% of this time, with the remaining time devoted to indirect requirements such as standby, cleanup, etc.

To summarize the requirements computation for the A-7:

25	Productive Direct Maintenance Manhours/Flying Hour
x 50	Flying Hours
1,250	Maintenance Manhours/Aircraft
x 24	No. of Aircraft/Squadron
30,000	Maintenance Manhours/Squadron
x 1.15	Ground Support Equipment Maintenance
34,500	Manhours for Maintenance of Aircraft and GSE
x 1.10	Maintenance Supervision (Planning, Scheduling, Quality Control)
37,950	Total Manhours Required

218	Hours Available for Work/Month
x .60	Productive Direct Manhour Factor
130.8	Direct Productive Manhours/Month

$$\frac{37{,}950 \text{ Productive Direct Manhours Required}}{130.8 \text{ Productive Direct Manhours Available Per Man}} = 290 \text{ Spaces Required for Squadron Maintenance}$$

$290 \div 24 = 12.1$ Maintenance Spaces Per Aircraft

1/ Maintenance manning for tactical air forces is calculated on a 60 hour wartime work week using wartime flying hours.

Munitions: These requirements are based on management engineering criteria. Included in this area is the manpower required for: loading, unloading, arming and dearming of committed munitions; inspection, testing and maintenance of all aircraft weapons release systems; maintenance, ammunitions loadings, activation and deactivation of aircraft gun systems; and a 30 day capability for munitions maintenance, storage and handling. The factor for the A-7 is 7.29 manpower authorizations per aircraft.

Supervision and Wing Staff: These requirements are based on management engineering standards and criteria. Included are the men required for squadron supervision and the squadron contribution to wing staff. These personnel perform such jobs as command, operations, planning and scheduling, flying safety, quality control on aircrew training and proficiency, etc. Each A-7 squadron requires 16 Officers and 35 Airmen.

Weapons Security: These requirements are based on manpower determinants. Security personnel are required for entry control, close and distant boundary support, security alert teams, etc. The requirement for an A-7 squadron has been determined to be 1 Officer and 46 Airmen.

Flying Hours: 50 hours per month (Wartime)

APPLICATION OF FACTORS

(24 aircraft, each flying 50 hours per month, with personnel working 10 hours a day and 6 days a week.)

	Officers	Airmen	Total
Crews: 24 x 1.1	27	0	27
Maintenance a/: 24 x 12.1	7	283	290
Munitions a/: 24 x 7.29	4	171	175
Wing/Squadron Staff	16	35	51
Weapons Security	1	46	47
Manpower Required for Typical A-7 Squadron	55	535	590

a/ Manhour factor converted to manpower with $2\frac{1}{2}\%$ as officers.

Manpower requirements for other types of squadrons are calculated in a similar manner. The following table shows complete breakdown of Air Force manpower required for all tactical air active squadrons:

TACTICAL AIR SQUADRON MANPOWER

	OFF	AMN	T/M
A-7 squadrons-typical squadron	(55)	(535)	(590)
Element total	495	4,795	5,290
F-105 squadrons			
24 UE typical squadron	(85)	(621)	(706)
12 UE typical squadron	(58)	(392)	(450)
Element total	143	1,013	1,156
F-4 squadrons			
18 UE typical squadron (SEA)	(80)	(558)	(638)
18 UE typical squadron	(64)	(486)	(550)
24 UE typical squadron	(85)	(625)	(710)
24 UE typical squadron (dual mission)	(103)	(835)	(938)
12 UE typical squadron	(57)	(365)	(422)
Element total	3,880	28,202	32,082
F-111 squadrons			
18 UE typical squadron	(76)	(576)	(652)
20 UE typical squadron	(81)	(630)	(711)
24 UE typical squadron	(94)	(730)	(824)
Element total	1,071	8,309	9,380
RF-4 squadrons			
18 UE typical squadron (SEA)	(96)	(617)	(713)
18 UE typical squadron	(78)	(458)	(536)
Element total	798	4,740	5,538
Special Operations squadrons			
10 UE A-1 squadron	(43)	(176)	(219)
16 UE AC-119K squadron	(155)	(553)	(708)
18 UE AC-130 squadron	(364)	(1,355)	(1,719)
10 UE CH-53 squadron	(53)	(168)	(221)
Typical squadron (mixed acft/UE)	(82)	(260)	(342)
Headquarters	(114)	(72)	(186)
School	(29)	(17)	(46)
Element total	1,343	4,173	5,516
Tactical Drone Support squadrons			
Typical squadron	(55)	(258)	(313)
Element total	55	258	313
EB-66 squadrons			
Typical squadron	(95)	(307)	(402)
Training squadron	(30)	(120)	(150)
Element total	125	427	552

The following table summarizes Air Force manpower and TOA required for tactical air forces:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
79	80	75	3.3	22%

The tactical air manpower totals shown above represent the number of personnel directly employed in carrying out the tactical air mission. There are, however, additional Air Force personnel who support the tactical mission, but are accounted for in General Support manpower programs. These support personnel provide supply support to tactical field maintenance units; bare base support to deployed units; and food, transportation, and military police services. The Army and Navy normally include these personnel in their tactical-direct mission manpower totals.

b. Navy

To perform the Navy's tactical air forces mission there are 14 attack aircraft carriers (CVA/CV) and 70 attack/fighter aircraft squadrons. Each carrier air wing consists of a mix of aircraft, including fighters, attack planes, reconnaissance aircraft, and support aircraft such as inflight tankers. Aircraft of a similar type are organized into squadrons. For each type of aircraft, criteria are established for the number of aircrews and maintenance personnel needed to keep the plane flying a specified number of hours per month in a fashion similar to that previously described for the Air Force. To these requirements are added personnel for administration and support. These total manpower requirements are expressed in a Squadron Manning Document for each type of aircraft squadron.

As an example, the manpower for an F-4B squadron is developed as follows:

Aircrew per aircraft: 2 (1 pilot, 1 radar intercept officer)

Aircrewmen needed for a 12 aircraft squadron: 32 (provides additional aircrews in order to fly the required number of sorties with sufficient crew rest between sorties - crew ratio is 1.33).

Maintenance men: 220

Administration & Support: 55

The specific manpower engineering techniques used to determine above manpower levels and to develop the requirements for aircraft carrier crews are discussed in the Naval Forces section.

The total requirement for Navy tactical air forces is then computed by multiplying the individual unit factors times the number of units in the force. A few additional personnel spaces are also provided to achieve a continuous maintenance capability for Naval Reserve tactical air units.

The manpower and TOA required for Navy tactical air forces is shown in the table below:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
	Manpower		TOA	% MILPERS
60	60	65	3.1	17%

c. Marine Corps

The Marine Corps has programmed 3 attack wings to carry out its tactical air forces missions. The manpower requirements for these forces are determined by essentially the same method as the Navy since the same types of aircraft are involved. The manpower requirements for the Marine Corps tactical air forces are:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
	Manpower		TOA	% MILPERS
27	27	27	.7	27%

D. Naval Forces - Strategy, Missions, Threat, Forces, Capabilities, and Manpower

U.S. Naval force planning, particularly as it applies to the sea control mission, is less tied to specific theater assumptions than land or tactical air forces. Accordingly, the strategy and threat for naval forces were not discussed earlier in the NATO and Asia sections of this Report.

1. Strategy and Missions

The principal sea control missions required of the Navy are:

a. In a NATO war U.S. and NATO Allied forces should be able to protect U.S. Naval forces at sea, military support shipping, and an austere level of economic support shipping.

b. In addition, in a NATO war U.S. and NATO Allied forces should be able to indefinitely maintain a minimum necessary flow of supplies from the U.S. to Europe against a maximum Soviet conventional interdiction effort.

c. Furthermore, in a NATO war U.S. forces in the Pacific should be capable of supplementing the forces of our Pacific allies to insure that a minimum necessary level of supplies can be maintained against expected threats to the sea lanes.

Other sea control missions can be met with forces planned for a, b, and c above. In addition to the above considerations, the Navy possesses a capability with its deployed forces to respond to crisis situations anywhere in the world with fully supported air and amphibious forces.

2. Threat

a. The Soviet Navy possesses a large submarine force including both nuclear and diesel long-range attack submarines capable of extended deployments on a worldwide basis. Included in the Soviet submarine force are several classes of cruise-missile launching submarines which appear to have been developed to counter the U.S. and allied surface naval forces.

b. Soviet Naval aviation possesses long-range, air-to-surface missile-armed bombers which can be projected against both naval forces and shipping in the sea lanes.

The Soviets also possess a sizable force of long-range reconnaissance (BEAR) aircraft. These aircraft have the range and endurance to be employed into either the Atlantic or Pacific.

Although Soviet surface forces have limited access to the open ocean, they have been increasing their overseas deployments in peacetime and developing the capability for sustained operations in the open ocean. Soviets surface forces do not possess sea-based tactical aircraft and, consequently, lack strong air defense capability except when within range of land-based interceptors. As a result they are most suitable for surprise attacks at the initiation of hostilities or defensive operations when within interceptor range of Soviet bases.

3. Planning Assumptions

Planning for general purpose naval forces begins with estimates of U.S. and allied land and tactical air forces needed to meet planned objectives in various areas of the world. These estimates include the requirement for U.S. Naval "projection" forces -- tactical air forces from carriers and amphibious forces. The amount of military support shipping that must be provided depends on the U.S. and allied forces committed in each theater.

Next, the economic support shipping required to sustain the countries allied with the United States during the conflict must be determined since this shipping may need protection. Generally an austere level of economic support is envisioned rather than the full peacetime level. In addition, a standown of economic shipping is considered during the early stages of a conflict to allow shipping to be organized into convoys and to allow naval forces to counter the high threat to the sea lanes anticipated early in a conflict.

With "projection" forces and military and economic shipping requirements determined, support force and sea control (or "protection") force requirements can be developed. Support forces (replenishment ships, tenders, and repair ships) are sized to provide required endurance at sea of naval forces and to provide logistics and material support to naval forces from forward sites.

Sea control forces are sized to provide protection to other naval forces and mercantile shipping against the surface, submarine, and air threat in the areas where naval operations are planned and shipping must operate. The appropriate level of sea control forces depends on such factors as the number of forces or ships requiring protection, the size and sophistication of the expected threat, and the geography involved. A mix of sea control forces with different types of weapon systems, both land-based and sea-based, are employed. This mix of forces provides defense in depth, takes advantage of geographic "choke points," and achieves a realistic balance among area and barrier-type forces and active point-defense forces.

In sizing our naval forces we must take into consideration more than just the level of wartime activity in any one land theater. This is because the Soviet Union may extend hostilities at sea into areas far removed from a concurrent land war where the U.S. and our allies must maintain essential sea lanes. It is necessary, therefore, to plan U.S. Naval forces worldwide.

Finally, in planning U.S. Naval forces, the total capabilities of both the U.S. and our allies must be considered. U.S. allies possess significant naval capabilities, including forces and equipment that have been obtained, financed, or modernized with U.S. assistance. Although few allied ships or aircraft are comparable to the most recent high technology U.S. forces, many of the allied forces are as capable as less recent U.S. forces.

An important factor in considering the capabilities of our allies is the coordinated planning required to operate U.S. and allied forces together in a timely manner in wartime. It is important that we and our allies perceive the threat in the same way in order for U.S./allied operations to be effective. Continuing U.S./allied dialog and operations are designed to improve coordination and communications between the U.S. and our allies.

4. Naval Forces and Their Capabilities

The following table shows the naval forces and manpower programmed for FY 73:

U.S. NAVAL FORCES

	FY 71	FY 72	FY 73
Forces			
Carriers (CVA and CV) a/	14	14	14
ASW Carriers (CVS)	4	3	2
ASW Air Groups (CVSG)	4	4	4
Attack Submarines			
Nuclear	51	57	60
Diesel	50	38	27
Surface Combatants	224	226	207
Amphibious Forces (MAF)	1 1/3	1 1/3	1+
Underway Replenishment Forces	59	60	61
ASW Patrol Squadrons	24	24	24
Total Active Ships	702	657	594
Active Military Manpower (000)			
Navy	205	205	194
Marine Corps	1	1	1

a/ Manpower for carriers and associated air wings is included in tactical air forces.

Naval forces are designed to perform projection and sea control missions in support of U.S. strategy. Naval projection forces include attack aircraft carriers which can project tactical air sorties ashore and amphibious assault forces which can project land forces ashore. Sea control forces include submarines; surface combatants, and tactical and ASW aircraft (both land-based and sea-based) which provide area and point defense to naval forces and mercantile shipping at sea. Support forces are provided to sustain naval operations at sea and provide mobile logistics and repair support from advanced bases. Briefly the major naval forces are:

a. Carriers

(1) Two types of carriers comprise U.S. carrier forces: attack carriers dedicated to tactical air missions and ASW carriers dedicated to broad ocean ASW. The concept of a multi-purpose carrier, or CV, which combines the attack and ASW carrier missions has been developed, and all our carriers are now scheduled for conversion to the multi-purpose role.

(2) Attack carriers contribute to tactical aircraft sortie requirements (as discussed in the section on tactical air forces). They have proven particularly valuable in areas where the U.S. does not have land bases or when land bases are overcrowded. This is exemplified by the employment of carriers in the Korean War and off Vietnam when the

carriers were not opposed. In direct confrontation with the Soviet Union, strong Soviet surface, air, and submarine naval forces could pose a serious threat to U.S. carrier forces requiring careful judgment in their employment. Accordingly, the Navy is continuing to improve defensive capability of the carrier forces to allow greatest possible latitude in their use.

(3) Attack, Multi-Purpose and ASW carriers contribute to the control of vital sea lanes. ASW carriers employ both fixed wing aircraft and helicopters to conduct ASW missions over broad ocean areas and to augment point ASW defense around naval forces and vital shipping convoys. All three types of carriers provide air defense against enemy bomber and reconnaissance aircraft employed against naval forces and convoys. They also provide aircraft to search out and attack enemy surface Naval forces should these forces pose a threat.

b. Submarines

General purpose submarines are designed primarily to perform anti-submarine warfare (ASW) missions. Because of their unique capabilities, wartime employment of submarines is envisioned in advanced ASW barriers across strategic "choke points" in the transit routes of enemy submarines between homeports and patrol areas. The roles, missions, and characteristics of future submarines are now under study by the Navy.

c. Surface Combatants

(1) Surface combatants comprise a wide spectrum of surface ship types that perform a variety of missions. In this category are cruisers, including the nuclear-powered LONG-BEACH; conventional and nuclear-powered frigates; "destroyer types," including the new SPRUANCE-class destroyer; and small ocean escort ships, including the KNOX-class destroyer escort.

(2) The principal mission of surface combatants is to provide point defense and escort forces to other naval forces and convoys. In this role they provide, in conjunction with other sea control forces, protection against submarine and air attack. Some protection against surface attack is currently provided by the conventional guns on most surface combatants. This capability is limited against the threat of Soviet missile-equipped surface ships and will be enhanced significantly when the U.S. surface-to-surface missile system (HARPOON) is introduced into the fleet.

(3) Surface combatants can perform a number of additional missions in combat including shore bombardment, search and rescue, air surveillance and control, offensive and defensive patrol, and naval blockade.

d. Anti-Submarine Warfare (ASW) Aircraft

Air ASW aircraft forces includes both carrier based aircraft (fixed wing and helicopters) and 24 squadrons of land-based P-3 maritime patrol aircraft. These aircraft, like submarines, can be used in a variety of roles in the control of the sea lanes: in advanced ASW barriers; as area search and destroy forces; and as escorts.

e. Amphibious Forces

These forces provide the capability to perform amphibious assaults in support of U.S. NATO and Asian strategies. Equally important, amphibious assault forces provide a high-readiness contingency force for landings with men, equipment, and aircraft integrated for combat. To carry out their missions, amphibious forces generate a requirement for other naval forces for protection (ASW, AAW, anti-surface), ancillary missions (mine warfare, close air support, naval gunfire support), and logistic support (replenishment and repair).

f. Support Ships

Support ships include underway replenishment ships; repair ships and tenders; and tugs, salvage vessels, and miscellaneous auxiliary ships. These forces increases the endurance of naval forces at sea, provide for logistic and material support of naval forces from advanced undeveloped sites, and perform various auxiliary roles. They contribute indirectly to the major missions performed by the Navy.

5. Determination of Manpower Requirements

a. Navy

After determination of the force mix, the associated force manpower is derived on the basis of workload requirements for specific ship and aircraft types. The primary device for measuring the workload is the Navy Manning Documentation Program. Using accepted work study techniques and manpower productivity criteria, the manpower needed to permit a given class of ship or aircraft squadron to perform its mission is established. These manpower levels are reflected in Ship Manning Documents (SMDs) and Squadron Manning Documents (SQMDs) for each type of squadron or ship.

In developing manning documents, the following workload, manpower productivity, and time available for work (i.e, standard work week, etc.) assumptions are used:

Standard work week for enlisted personnel afloat.

At Sea

Watchstander	74 hours
Non-Watchstander	66 hours

In Port

Watchstander	45 hours
Non-Watchstander	41 hours

1-in-6 Duty Rotation Minimum Objective

Standard work week routine:

	Watchstander		Non-Watchstander	
	At Sea	In Port	At Sea	In Port
Watch	56.00	9.33	--	--
Training	2.00	2.83	3.00	3.00
Service Diversions	2.50	3.37	3.00	3.50
Scheduled Work	13.50	28.67	37.50	31.00
Unscheduled Work		.80	22.50	3.50
Total Work Week	74.00	45.00	66.00	41.00

Service diversions include quarters inspections; sick call; and pay line, administrative and judiciary requirements. They are accomplished during normal off-watch working hours and, therefore, deduct from an individual's capacity to do productive work. These factors have been developed from experience, based on work sampling techniques.

A percentage allowance is also applied to basic productive work requirements to reflect those delays arising from fatigue, environmental effects, personal needs, and unavoidable interruptions which serve to increase the time required for work accomplishment.

Application - 20% factor applied to all maintenance transactions

Example - 1.00 Maintenance work required
x .20 Productivity allowance

1 hr. 12 min. allotted to complete transaction

A further time allowance for tool drawing, publications gathering, equipment entry, transaction recording, and put away is also used for preventive maintenance efforts.

Application - 30% applied to all PM transactions

Example - 1.00 PM work required
x .30 Make ready/put away allowance

1 hr. 18 min. allotted to complete transaction

The work week on board a ship at sea under wartime readiness conditions that is used for manpower planning is summarized below:

Watchstander		Non-Watchstander	
74	Available for work	66	Available for work
-56	Watchstanding	-6	Total service diversion
18	Available for maintenance	60	Available for maintenance (includes allowances)
-4.5	Total service diversion		
13.5	Available for maintenance (includes allowances)		

Using these standards, manning documents are prepared for each class of ship, establishing the manpower requirements. These requirements are further subdivided by pay grade to provide the proper mix of skill levels and to provide for command and supervision. Thus, a DDG-2 class destroyer has a manpower requirement of 338 personnel. Of these, 19 are officers, 22 are Chief Petty officers, and 297 are other enlisted grades. One-hundred ninety-five of the 338 men are required to continuously man operational positions, and the remainder are needed for maintenance, administration, and support. Aircraft squadrons are similarly manned based on the air crews, maintenance, and support personnel needed to support the wartime flying rate.

EXAMPLES OF FY 73 NAVAL FORCES MANPOWER

Unit	Average Manning	Number of Units
ASW Carrier	1,630	2
ASW Air Group	950	4
ASW Patrol Squadron	351	24
Attack Submarines	108	87
Destroyers (DD/DDG)	300	140 (35 NRT)
Major Fleet Escorts:		
Cruiser (CG/CLG)	987	8
Frigate (DLG)	413	29
Amphibious Assault Ships:		
Other than LST	416	45
LST	223	20
Underway Replenishment Ships	332	61

The above figures illustrate the planning that is used in developing manpower requirements. The actual budget is based on a detailed analysis by individual ship and aircraft type, with special allowances used for ships in overhaul, conversion, and precommissioning status. In addition

to ships and aircraft squadrons, manpower must be provided for such combat support units as Mobile Construction Battalions (Seabees), Underwater Demolition Teams, and Fleet Support Squadrons. These requirements are based on the tasks to be performed in each unit and the assigned missions. All of these individual requirements for each ship, squadron, and combat support unit are then summed to determine the total manpower needed for naval forces, shown in the table below:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
205	205	194	7.2	22%

The total Navy military manpower requirements are also influenced by the necessity for providing shore billets for certain categories of personnel whose skill specialities are not required ashore in sufficient numbers to allow equitable sea/shore rotation patterns. These categories of personnel include such ratings as boilermen, engine and hull specialists, and ordnance personnel. Because currently the time between sea/shore rotation exceeds four years for these categories of enlisted personnel, they are designated as "deprived ratings," and assigned to other productive occupations ashore which do not necessarily require military personnel with their skills. In FY 73 there are about 12,000 of these billets.

b. Marine Corps

The Marine Corps provides security detachments for major Navy ships carrying nuclear weapons. The manpower and TOA required for this purpose is shown below:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
1	1	1	*	100%

NOTE: * - less than .1 Billion.

E. Mobility Forces - Strategy, Missions, Forces, Capabilities and Manpower

1. Strategy

The goal of the total force concept in supporting realistic deterrence is to provide a combination of allied forces and U.S. forces adequate to deter all forms of war. One aspect of this deterrence is the visible ability to bring our forces to bear quickly when it is in our national interest. A major factor supporting this goal is the clear capability, when consistent with our policy, to bring U.S. forces to our allies' aid in time to deter or to counter aggression which they alone cannot meet. One means of achieving such a clear capability would be to maintain an adequate level of U.S. forces in each potential trouble spot. An alternative strategy is to maintain a smaller total U.S. force stationed at central locations and provide mobility forces to deploy them quickly. In fact, the goal of strategic mobility forces is to provide flexibility of deployment so that the overall level of general purpose forces is lower than would otherwise be necessary to constitute a realistic deterrent.

2. Missions

The threats to which U.S. forces must respond, and in turn require lift from our mobility forces, range from a minor contingency, requiring one to two brigades, to a Warsaw Pact attack on NATO. Deployments to a minor contingency can for the most part be accomplished by the active mobility force. In order to meet deployment requirements in response to a Warsaw Pact attack on NATO, or Chinese aggression in Asia, we would rely on full mobilization of reserve forces and large numbers of commercial aircraft and ships in addition to the active forces.

Present planning for the spectrum of possible deployments utilizes principally military and U.S. commercial assets. However, recognizing the considerable lift assets of our NATO Allies, we are beginning to adjust our planning to include their participation in supporting deployments to NATO.

3. Mobility Forces and Their Capabilities

a. Introduction

Mobility forces are comprised of strategic and tactical airlift, sealift, pre-positioned equipment, and mobility support forces including air and sea terminals. Specialized forces such as aeromedical evacuation, aerospace rescue, and air weather service are also included.

The table below displays the current program for selected major mobility force components and manpower:

MOBILITY FORCES

	FY 71	FY 72	FY 73
Airlift			
Active Strategic Airlift (Squadrons/AAI)	17/334	17/339	17/356
Active Tactical Airlift (Squadrons/AAI)	28/549	18/354	17/327
Reserve/Guard Airlift (Units/AAI)	54/323	55/350	51/314
Sealift			
Active Strategic Sealift (Ships)	94	71	69
Active Military Manpower (000)			
Air Force	68	60	53
Navy	3	3	3
Army	2	1	1

b. Airlift

(1) Strategic Airlift: As presently programmed, U.S. strategic airlift resources will provide the basic capability to meet the spectrum of deployment requirements through the 1970s. By the end of FY 73, the full C-5A force structure will be attained and the active strategic airlift force will consist of 4 squadrons of C-5As and 13 squadrons of C-141s. In addition to these military assets, U.S. mobility forces include approximately 330 commercial aircraft in the Civil Reserve Air Fleet (CRAF), 60% of which possess the capability to transport cargo.

In FY 73, we are planning additional adjustment to the resources of our mobility forces to revise the mix of aircraft and aircrews, as well as maintenance and aerial port personnel, in support of our deployment

objectives. We have also made adjustments in the ratio of active to reserve personnel in our strategic airlift force by reducing the number of active personnel while increasing the number of reserve personnel in the Associate Units.

(2) Tactical Airlift: In contrast to the strategic airlift force which provides the deployment capability for U.S. forces, tactical airlift provides airlift within the contingency area for U.S. and allied forces. This support includes the movement of unit equipment, resupply, and passengers. In FY 73, our active tactical airlift force will consist of 16 squadrons of C-130E aircraft and one specialized ski-equipped C-130 squadron stationed in Alaska. To replace the active force STOL capability transferred to the Reserve forces and lost due to the VNAF modernization program and replace the aging C-130 force, we will proceed with the Advanced Medium STOL prototype program. This program will result in an operationally suitable prototype aircraft which will provide an option for procurement.

(3) Reserve Airlift: In addition to our increased emphasis on the reserve portion of our strategic airlift force, we have also significantly increased the tactical airlift capability of the reserve forces. The Air Force Reserves will have 17 units equipped with C-130 aircraft and 6 squadrons equipped with STOL aircraft. The Air National Guard will possess 10 units equipped with C-130 aircraft and one specialized C-123 unit in Alaska.

c. Sealift

We rely very heavily on sealift to move the bulk of our equipment and supplies. Massive lift capability is essential. For example, although the equipment for an infantry division weighs only 30,000 tons, the equipment required for the supporting units for the division weighs 86,000 tons. The division and its support units consume supplies at the rate of about 1,300 tons per day when in sustained combat.

In the mid-1970's, without acquisition of new assets, the DOD strategic sealift force of government-owned and long-term chartered vessels will be limited to roll-on/roll-off vessels. To meet wartime needs, DOD must rely almost exclusively on U.S. commercial shipping which can be mobilized under Presidential authority. During a NATO contingency, DOD could also rely on the commercial shipping assets of our NATO Allies, although the timing of their availability is uncertain. In the next several months, DOD will be working with our Allies to develop agreements regarding the availability of these NATO-flag vessels. Despite these U.S. and foreign commercial shipping resources, DOD may require specialized shipping which is not available from commercial sources.

The major DOD sealift policies and programs are currently undergoing extensive review through an interagency examination of military sealift procurement, requirements, and capabilities. Participants, in addition to DOD in this examination, entitled the Sealift Procurement and National Security (SPANS) Study, are the Department of Commerce, Federal Maritime Commission, and Office of Management and Budget. The issues which are to be resolved by the SPANS Study by the end of March 1972 are: (1) possible revision of the competitive negotiated procurement system used to obtain rates for the movement of peacetime cargo under shipping and container agreements; (2) the need to acquire especially designed vessels for a DOD controlled fleet; and (3) the development of a strengthened Sealift Readiness Program which will make available in a timely manner sufficient commercial shipping resources needed to meet the requirements of minor contingencies.

4. Determination of Manpower Requirements

The manpower required to carry out mobility forces missions is determined by each Service as follows:

a. Air Force

Mobility forces perform the strategic and tactical airlift missions of the Air Force, operate the aerial port terminals for the transportation of cargo and personnel, and perform Air Force weather, aeromedical evacuation and aerospace rescue/recovery missions.

Mobility force manpower includes the crews, aircraft maintenance personnel, weapons system security personnel, and airlift support services personnel required to support the forces. The determination of these requirements is in accordance with the procedures described in the section on tactical air forces. Airlift support services manpower is distributed throughout the Military Airlift Command airlift wings, support wings, support groups, and various support squadrons and detachments to provide enroute aircraft maintenance, supply support, and airlift command posts. Force personnel are also needed to man the squadron and wing staffs to perform such functions as unit training, flying safety, and command and control. In the case of air weather service, it also includes the personnel required to operate base weather units. These manpower requirements are predicated on specific equipment, hours of operation, and mission requirements for each individual location. There is also a manpower requirement to support Army weather needs and the Air Force weather and aerospace rescue and recovery headquarters.

The table below summarizes Air Force manpower required for mobility forces:

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
Manpower			TOA	% MILPERS
68	60	53	1.2	44%

The mobility manpower totals shown above represent the number of personnel directly employed in carrying out the air mobility mission. There are, however, additional Air Force personnel who support the mobility mission, but are accounted for in General Support manpower programs. These support personnel provide supply support to mobility field maintenance units and food, transportation and military police services.

b. Navy

Navy mobility forces consist, primarily, of the Military Sealift Command (MSC). Since MSC ships are civilian manned, the only military personnel required for MSC are those in headquarters elements. However, also included in mobility forces are the Navy Weather Service and the Navy Oceanography Office. The Weather Service consists of Fleet Weather Centrals at major Navy bases and detachments at other naval air station and operating bases. The manpower requirements are determined by the services provided to the fleet. Using standard work measurement and workweek criteria, the number of men needed to produce the required services is determined. A small number of administrative personnel is also needed to control and supervise these operations.

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
	Manpower		TOA	% MILPERS
3	3	3	*	32%

NOTE: * - less than .1 Billion.

c. Army

Military manpower required for mobility forces consists of those personnel involved in the operation of Department of Army non-industrially-funded water ports in the overseas areas. Personnel provide traffic management services in support of the movement of DOD cargo and passengers within CONUS and to overseas commands. Included are Army elements of the Military Traffic Management and Terminal Service (MTMTS), the DOD single manager for surface transportation.

The bulk of the work force (86%) is civilian. The military manpower requirements are based on the number of terminals to be operated, and the command, control, and management requirements derived from the estimated volume of cargo and passengers to be moved. These factors are reviewed annually, and the manpower needs adjusted accordingly. As an example, the Army terminal at Bayonne, New Jersey is manned with 50 military and 1,090 civilians, for a total of 1,140 personnel.

MILITARY MANPOWER (000) AND TOA ($ BILLIONS)

FY 71	FY 72	FY 73	FY 73	
	Manpower		TOA	% MILPERS
2	1	1	*	24%

NOTE: * - less than .1 Billion.

IV

OTHER MISSION FORCES

The "Other Mission Forces" carry out major defense-wide programs under centralized control. These missions include Intelligence and Security, Communications, Research and Development, and Support to Other Nations. The following table shows the military manpower programmed for these missions in FYs 71, 72, and 73 along with the civilians estimated in FY 73 for comparative purposes.

DOD OTHER MISSION MILITARY MANPOWER (000)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Intelligence & Security	91	75	68	36
Communications	55	52	50	20
Research & Development	37	37	35	84
Support to Other Nations	21	17	27	5
Total Other Mission	204	181	180	145

Intelligence and Security

This category includes the centralized intelligence gathering agencies of the Department of Defense. Their operations are directed primarily toward the development of national or strategic intelligence for use in strategic planning and national intelligence estimates. In addition to their role of satisfying national intelligence requirements, intelligence units also provide some support to tactical commanders. We plan these activities on a completely integrated basis to ensure that there is no unnecessary duplication of effort. As a result of centralized direction, significant manpower efficiencies have been possible without a reduction in intelligence effectiveness. From a level of 91,000 military in FY 71, we plan for 68,000 military in FY 73, a reduction of 25%.

Intelligence resource policies and controls are exercised by the Secretary of Defense. To strengthen this management, a new Assistant Secretary of Defense (Intelligence) was appointed during the past year to improve management of intelligence resources, programs and activities and to readjust from the operational problems of Southeast Asia to the longer term strategic needs. The specific requirements for the intelligence collection activities are established at many levels. The Services establish their requirements for intelligence to support force planning, field operations, such as those in Vietnam and other contingencies, and research and development. The Joint Chiefs of Staff compiles its own intelligence requirements along with those of the Unified and Specified Commands. These and other strategic guidance issuances from the Office of the Secretary of Defense (OSD) form a basis for budget and manpower allocations. The national intelligence community (the National Security Council, the Central Intelligence Agency and the Department of State) relies heavily on the intelligence resources of the DOD and through the medium of the United States Intelligence Board establishes requirements and priorities for which the intelligence elements of the DOD and Services must apply dollar and manpower resources.

INTELLIGENCE AND SECURITY MILITARY MANPOWER AND TOA
(Manpower in Thousands, TOA in Billions)

	FY 71	FY 72	FY 73	FY 73	
	Manpower			TOA	% MilPers
Army	32	25	20	.4	53%
Navy	18	15	14	.4	28%
Marine Corps	2	2	2	*	93%
Air Force	38	33	31	2.2	13%
Total Intelligence & Security Manpower & TOA	91	75	68	3.0	21%
Military Assigned to Defense Agencies a/	7	6	6		
Total Military Assigned to Intelligence & Security Functions	97	81	74		

NOTE: * Less than .1 Billion.

a/ Military personnel authorized for Defense intelligence agencies are included in the Command category (see Chapter V). To permit a complete discussion of intelligence functions, they are also included in this section.

The total Defense Intelligence Program can be divided into three sub-categories.

1. Consolidated Cryptological Program (CCP) and Advanced Program Support (APS), managed by the Director, National Security Agency.

The manning of individual military intelligence units is determined by functional requirements, manning criteria, and engineering standards. These normal manning authorizations are altered from time to time to fit unusual situations. The criteria for these authorizations have been arrived at through experience, and they are modified from time to time as broad missions of the staffs change, as science and technology impacts on the methods and procedures of intelligence, and as actual combat experience requires.

2. General Defense Intelligence Program (GDIP), managed by the Director, Defense Intelligence Agency.

a. Cryptologic Program

The cryptologic program consists of the resources required to carry out the mission of the National Security Agency which involves the performance of highly specialized technical functions in support of the intelligence activities of the United States. Resources included are those authorized and appropriated by the Congress, for selected intelligence organizations of the Army, Navy and Air Force as well as the National Security Agency.

Detailed management of the cryptologic program is vested in the Director, National Security Agency who has been assigned three basic responsibilities for this purpose under the Secretary of Defense:

(1) organizing, operating, and managing certain activities and facilities for the production of intelligence information;

(2) organizing and coordinating the research and engineering activities of the U.S. Government which are in support of the Agency's assigned functions; and

(3) regulating certain communications in support of Agency missions.

b. General Defense Intelligence Program

The General Defense Intelligence Program complements the Cryptologic Program by collecting intelligence information by human and technical means under the management of the Defense Intelligence Agency. Some of the activities include human collectors managed by the Military Departments. Technical collection includes that intelligence collected by air and ground based sensors such as aircraft and ground based radars.

Communications

This category is made up of the centralized communications systems of the Services and the Defense Communications Agency providing the backbone common-user system for all elements of DOD. This program is also centrally managed in order to avoid duplication of effort and to improve the responsiveness of the communication system to our national command authorities. As a result of our improved management, we have reduced the manpower needed to support our communications systems without reducing our capabilities. A reduction from 54,000 military actually used in FY 71 to a planned requirement of 50,000 in FY 73 represents an 8% reduction.

Command and control of our forces is exercised through the Defense Communications System and the supporting Service communications system. The basic communications requirements are established by the deployment of

our forces. Then, based on prior experience and the expressed needs of the field commander, the required capacity for each of several modes of communication (e.g., voice, teletype, etc.) is determined. The required capacity and the technical state of the art then determine the number and location of transmitter sites, relay stations, etc. Each such operating location is manned based on the number of operating positions to be filled, maintenance manhours required, and the need for administration and support. The total strength of the communications category is then determined by the number of operating locations, the manning of each, and additional personnel for supervision and support of the system as a whole.

COMMUNICATIONS MILITARY MANPOWER & TOA
(Manpower in Thousands, TOA in $ Billions)

	FY 71	FY 72	FY 73	FY 73	
	Manpower			TOA	% MilPers
Army	16	14	13	.4	29%
Navy	10	10	9	.4	23%
Marine Corps	*	*	*	*	-
Air Force	29	28	27	.8	40%
Total Communications Manpower/TOA	54	52	50	1.5	32%

NOTE: *Less than 500 manpower spaces or .1 Billion TOA

Research and Development

This category covers the research and development not associated with the development of major weapons systems that have been included in other categories such as Strategic or General Purpose Forces. In general terms, this category covers mainly the technology base of the DOD R&D program. The foundation of all U.S. weapon system development is this large "technology base". Many new weapon concepts originate in this base, and the progression from idea to weapon always involves the base in various ways. From the base also come advances in such areas as oceanography, meteorology, and medicine which contribute directly to improved operational capability and personnel performance. The technology base is characterized by breadth, complexity, and constant change. It encompasses virtually all aspects of the physical, biomedical, environmental and behavioral sciences, plus the engineering disciplines. The military personnel assigned to R&D perform technical and management duties at our 122 DOD Laboratories and Test Facilities. They also participate in special evaluations of equipment by serving in experimental troop units or comparable military organizations.

We have attempted to retain military manpower in R&D activities at a reasonably stable level over the years to assure the accomplishment of these essential stated objectives. Even so, a small reduction of 5% is being made in the area.

Military personnel assigned to this category are a vital part of the entire DOD R&D program. This is true for two reasons: First, many of our military personnel hold advanced degrees in science and engineering and are well respected in the scientific community for their contribution to Science. The second and probably the most important requirement for these personnel is that being experienced military professionals they are very familiar with military requirements for new weapons and equipment, and they bring this experience with them to help orient the direction and thrust of the DOD R&D program and insure that the program is directed towards areas that will satisfy the requirements of the Armed Forces.

RESEARCH AND DEVELOPMENT MILITARY MANPOWER AND TOA
(Manpower in Thousands, TOA in $ Billions)

	FY 71	FY 72	FY 73	FY 73	
	Manpower			TOA	% MilPers
Army	9	9	9	1.5	6%
Navy	8	8	8	1.5	5%
Marine Corps	*	*	*	*	-
Air Force	20	19	19	1.8	12%
Total Research & Development Manpower	37	36	35	4.8	8%

NOTE: * Less than 500 manpower spaces or .1 Billion TOA.

Support to Other Nations

This category consists of Military Assistance groups and international military headquarters. In conjunction with the Department of State and the U.S. Ambassador to the host nation, each assistance activity is individually tailored to meet the needs of the country to which it is assigned. In view of the emphasis the Nixon Doctrine placed on helping our allies help themselves, this program has increased. Most of the increase represents an accounting transfer of manpower from U.S. combat forces to Support To Other Nations.

SUPPORT TO OTHER NATIONS MILITARY MANPOWER AND TOA
(Manpower in Thousands, TOA in $ Billions)

	FY 71	FY 72	FY 73	FY 73	
	Manpower			TOA	% MilPers
Army	15	10	10	1.4	18%
Navy	4	5	5	.1	45%
Marine Corps	*	*	*	*	-
Air Force	2	2	12	.7	9%
Total Support to Other Nations Manpower	22	18	27	2.2	17%

NOTE: * Less than 500 manpower spaces or .1 Billion TOA.

Other Mission Manpower Summary by Services

The table below displays military manpower by Service. The differences in Other Mission manpower among Services is due to differences in missions. Even though these workloads are somewhat independent of the overall level of U.S. forces, the reductions from 204,000 to 180,000 military represent a 12% reduction in three years, which is consistent with a 13% reduction in total DOD military end strengths for the same period. Since FY 68, Other Mission manpower has been reduced 21% (228,000 to 180,000).

OTHER MISSION MILITARY MANPOWER (000)

	FY 71 (Actual)	FY 72 (Programmed)	FY 73
Army	72	58	52
Navy	41	38	36
Marine Corps	2	2	2
Air Force	89	82	89
Total Other Mission Manpower	204	181	180
Other Mission Manpower/Total Service Manpower			
Army	6%	7%	6%
Navy	7%	6%	6%
Marine Corps	1%	1%	1%
Air Force	12%	11%	12%

V

GENERAL SUPPORT AND MANPOWER REQUIREMENTS

Purpose and Types of Support

Combat forces cannot survive in conflict without adequate support. During peacetime, the readiness of our mission forces and their standard of living are the direct products of the support system. As we look forward to the all-volunteer environment, cognizant of the increasing cost of manpower, it is essential that we fully understand the role of support in the Department of Defense and that we take continuing action to provide the necessary support at the lowest cost.

There are three tiers of support in the Defense structure:

Organic Support functions are performed by individuals assigned to combat, or mission, units. These would include, for example, men performing maintenance, security, and administration in an infantry battalion or tactical fighter wing. Such men are trained and expected to bear arms against an enemy and are integral to units whose primary mission is combat. Because it is difficult to draw a clear line between these support people and their more combat-oriented counterparts in the same units both are included in mission forces. Nevertheless, each military service periodically reviews the composition of its combat units in order to increase the effectiveness per man in each such unit, aiming to provide adequate organic support with the minimum of support manpower.

Direct Mission Force Support consists of activities which, while not fully allocable to a specific kind of unit (division, wing, or ship), directly support a group of complementary mission functions that produce a common major output and are called a program (e.g., Strategic Programs). These activities usually fall into categories called base operations, logistics, training, and command. For example, a Strategic Air Command base provides maintenance, supply, security, and general housekeeping services for a group of strategic program functions assigned to that base (e.g., B-52's, tankers, SR-71 reconnaissance aircraft, and airborne command posts).

Central Support is that which cannot be associated easily with a single Defense program or mission, and therefore takes on a character of being joint or common support. Included are centralized supply, maintenance, training, and headquarters which provide service-wide support to several major programs (e.g., Navy undergraduate pilot training trains men for fighter-attack, ASW patrol, transport and helicopter missions). General Support includes both direct program support and central support. Such an aggregation permits a more comprehensive view of support than we have had in the past and opens the door to more thorough analysis to enable us to provide necessary support in a more economical manner.

In the remaining sections of this chapter, we discuss the "combat-to-support ratio" and we describe and discuss in detail the components of the major fiscal guidance category of general support.

The Combat-to-Support Ratio

A. Introduction

In earlier chapters of this report we discussed the mission forces of the Department of Defense and the manpower required to operate those forces, and in the previous section we defined a concept of support. A comparison of combat elements and support is inevitable. There are several alternative ways of reflecting the distribution of manpower between combat and support functions.

B. Defining the Ratio

There is a wide range of valid answers to the question, "What is the combat-to-support ratio?" There is no "best" definition. The definition of what can be included in combat varies by Service because of differing organizations and missions; for example, the Navy and Air Force tend to be weapons systems oriented, requiring fewer men directly engaging the enemy than do the Army and Marine Corps. Therefore, there are many ways to define combat and support and no simple ratio can be used as an adequate measure of whether there is a proper balance between mission forces and support.

This report presents seven different views of combat and support for each Service, beginning with a very detailed level (i.e., individual skills) and ranging up through the broad level of major Defense Programs. A detailed discussion of each method is shown below.

Combat Skills. This category includes all individuals whose primary duty is to fire at the enemy. For the Army and Marine Corps, it includes infantry, armor/cavalry, and artillery skills. For the Navy, it includes unrestricted line officers, torpedomen, fire control technicians, aviation antisubmarine warfare operators, gunners mates, and minemen. For all Services, it includes the crews of mission aircraft.

Intermediate Combat Units. This category includes units at the battalion, squadron, ship level whose primary mission is to fire at the enemy. For the Army and Marine Corps, it includes infantry, armor/cavalry, and artillery units of battalion or smaller size. For the Navy, it includes combat ships. For all Services, it includes combat aviation units of squadron or smaller size.

Modified Major Mission and Support Categories. This grouping is the same as described below, except that units which provide direct support are removed from the standard categories and placed in a separate Direct Support category. For example, Navy support ships are moved from Force Mission to Direct Support. The number shown is the percentage of total manpower which remains in Force Mission units.

Major Mission and Support Categories. This system was introduced in Chapter 1 and consists of three major categories: Force Mission, Other Mission, and General Support. The number shown is the percentage of total manpower in Force Mission units. The logic here is that the Services are given primary missions (as discussed in Chapter III), and they require a certain amount of support to accomplish those missions; the support is discussed in Chapter IV (Other Mission) and later in this chapter (General Support).

Major Combat Units. This category covers large organizational elements that engage in combat as an entity even though parts of the organizations may not directly face hostile fire as their primary mission. For the Army and Marine Corps, it includes divisions and their deployed supporting units, separate brigades, regiments, and separate combat units such as artillery, air defense, aviation, target acquisition, and special forces. For the Air Force and Marine Corps Air Units, it includes the total wing structure, including aircraft and missile squadrons, maintenance, munitions, weapons system security and command functions. For the Navy, it includes the fleet structure, encompassing fleet commands, type commands, and all subordinate units.

FYD Programs I, II, IV. This category includes the Five Year Defense Programs I (Strategic Forces), II (General Purpose Forces), and IV (Airlift, Sealift Forces). In addition to combat and combat support units, these programs include all base support, crew and unit training, logistics support, and command and control support necessary to accomplish the mission of the programs.

Operating Forces. This category consists of all combat units, combat support units, and all deployed support. This represents a close approximation of the Operating Forces categories that were previously used in budget presentations to the Congress prior to FY 1962, the main categories of which are Operating Forces, Supporting Forces (including special activities), Training Forces, and Individuals (transients, patients, and prisoners).

Using the preceding seven definitions, the table below indicates for each Service the per cent of total military manpower which could be considered as "combat." In general, there has been a slight decline in these percentages since 1964, for reasons which are explained later in this section.

PERCENT OF MILITARY MANPOWER IN COMBAT/FORCE MISSION UNITS, FY 64-73 a/

	FY 64	FY 68	FY 71	FY 72	FY 73
Army					
Combat Skills	*	*	23	23	24
Intermediate Combat Units (Battalions)	*	*	23	24	26
Major Mission & Support Categories (Modified)	37	31	27	33	34
Major Mission & Support Categories	57	50	51	51	53
Major Combat Units (Divisions)	*	*	49	52	54
FYD Programs I, II, IV	63	52	53	53	54
Operating Forces	64	55	57	56	57
Navy					
Combat Skills	*	*	11	11	11
Intermediate Combat Units (Ships/Sqdns)	38	35	33	35	34
Major Mission & Support Categories (Modified)	38	35	33	35	34
Major Mission & Support Categories	50	50	46	48	47
Major Combat Units (Fleets)	53	53	49	50	49
FYD Programs I, II, IV	63	63	58	59	57
Operating Forces	62	63	60	61	60
Marine Corps					
Combat Skills	*	*	28	28	28
Intermediate Combat Units (Battalions)	*	*	28	32	32
Major Mission & Support Categories (Modified)	42	42	38	45	45
Major Mission & Support Categories	58	52	48	54	54
Major Combat Units (Divisions/Wings)	*	*	48	53	54
FYD Programs I, II, IV	68	61	59	63	64
Operating Forces	69	60	60	65	65
Air Force					
Combat Skills	*	*	5	5	5
Intermediate Combat Units (Squadrons)	9	11	12	12	12
Major Mission & Support Categories (Modified)	31	32	29	29	28
Major Mission & Support Categories	34	44	33	33	32
Major Combat Units (Wings)	61	61	57	58	56
FYD Programs I, II, IV	63	64	59	58	58
Operating Forces	74	77	72	71	70

a/ Numbers shown are "combat" personnel as a per cent of total manpower in each Service. The total includes "individuals" (trainees, transients, etc.). If combat personnel are taken as a per cent of the manpower in units, the percentage will be higher.

NOTE: * Data presently not available.

The categories shown in the table can and do serve to measure general trends in combat-to-support ratios. But this is all they can do. Forces cannot be designed to meet an abstract concept like combat-to-support

ratio, but instead must be designed to provide an efficient mix of combat and support units to accomplish the specific tasks given to the Services.

C. The Development of a Support System

In determining support requirements for its combat forces, each military Service considers such factors as its operations plans and policies, to estimate the logistical impacts of mission; enemy situation; type of combat forces to be supported; terrain and climate; availability in the operational area of medical, transportation, and communications facilities; and special requirements for other Services and allied forces. Additional information is obtained from administrative plans and policies about medical evacuation, materiel stockage level, in-theater maintenance, construction, and other logistical problems. A simple change in policy can have a very significant impact on the support requirements. For example, an accelerated medical evacuation policy decreases requirements for engineer construction units in the theater (as fewer hospitals need to be built) but increases the need for transportation units and replacement personnel.

Certain underlying principles are also used in the force structuring process, including:

. Maximizing combat power through advanced technology rather than gross application of American combat soldiers.

. Making forces essentially self-sustaining.

. Being versatile enough to support our various global commitments.

These principles, which help determine the shape and texture of our force structure, differ from those of other nations. For example, compared to combat forces of other armies, U.S. combat units generally have much greater staying power than most foreign units.

Technology and Combat Power

One of our principles is to decrease the number of our men exposed to enemy fire by taking advantage of technology to attain equal or increased combat effectiveness. We have thus been able to reduce our total force, and particularly the percentage of our force dedicated to direct combat.

Improved weapons systems such as tanks, attack helicopters, and artillery munitions, have permitted increased combat productivity in terms of effectiveness per man directly exposed to enemy fire. A gross measure of increases in combat productivity is obtained by applying Weapon Firepower Potential Scores (WFP) to the weapons found in 1951

and 1969 Army forces. Based on WFP, the table below shows that the 1969 standard M60A1 tank is nearly three times as effective as the 1951 standard M4A3. (Actual effectiveness may be considerably better since WFP is an index based on the lethal area covered by the weapon. It ignores advances such as armor protection, range, and mobility and compares weapons only on the basis of the lethality of each round and the number of rounds the weapon is expected to deliver.

WEAPON FIREPOWER POTENTIAL (WFP), 1951 - 1969

Weapon	Year	Type	% Change in WFP	1969 Times as Effective as 1951
Tanks	1951	M4A3		
	1969	M60A1	+165%	2.7
Anti-Tank	1951	75mm RR		
Weapons	1969	TOW	+350%	4.5
Machine	1951	.30 Cal		
Guns	1969	7.62 mm	+ 82%	1.8

WFP scores are potential. The M60A1 tank is a potentially more powerful weapon than the M4A3: it has a larger, more accurate main gun; it provides a far more stable firing platform; its range-finding system enables the gunner to fire with much greater accuracy. Similarly, today's TOW wire-guided anti-tank missile has been demonstrated to be far more accurate than the 75mm recoilless rifle of the Korean War era, and it allows the infantryman a greater stand-off distance from the target. However, these modern weapons require more support to ensure their effective operation on the battlefield. In order to achieve their potential firepower, these weapons need more maintenance, supply, and transportation than did the weapons of the Korean War. More training is required both for the operators and those who must maintain these weapons. Finally, we must continue our research and development programs (which are also considered support) in order to equip our soldiers with the most effective weapons which our technology can provide.

Using the same years and WFP for comparison, the next table, Unit Firepower Potential (UFP), 1951 - 1969, shows that a tank battalion in 1969 is nearly twice as effective as it was in 1951 even with 28 per cent fewer tanks. The table also shows that an infantry battalion with only two per cent more men is nearly three times as effective as it was in 1951.

UNIT FIREPOWER POTENTIAL (UFP), 1951 - 1969

Unit	Year	Combat Strength	% Change	% Change in UFP	1969 Times As Effective as 1951
Inf Bn	1951	538			
	1969	547	+ 2%	+186%	2.9
Tank Bn	1951	406(71 Tanks)			
	1969	294(54 Tanks)	-28%	+ 83%	1.8
Div Arty	1951	1623(72 Tubes)			
	1969	1653(76 Tubes)	+ 2%	+600%	7.0

Modern technology has dramatically increased the combat capability of our forces and permitted reductions in the number of soldiers directly exposed to enemy fire. At the same time these more complex weapons have increased the requirements for supply, transportation and maintenance personnel. In addition, systems such as tactical nuclear weapons and helicopter gunships, while very destructive on a per weapon basis, have been added to the force and carry with them large support requirements. The net effect has been a decrease in the percentage of men in direct combat positions since the Korean War.

In non-combat units, technology has also contributed improvements. For example, improved techniques in medical evacuation using helicopters have made it possible to provide earlier and more sophisticated medical treatment to the wounded contributing, at least in part, to the declining casualty rates experienced in recent conflicts. For example, the table below shows that, while the Vietnam casualty rate was only about 13 per cent lower than in the Korean War, the rate for battle deaths was nearly 44 per cent lower.

CASUALTY DATA
(Annual Rates per 1000 Soldiers)

	WWI	WWII	Korean War	Vietnam War	Per Cent Change Korea to VN
Battle Casualties a/	83.5	30.6	22.7	19.8	-12.8%
Battle Deaths b/	16.1	9.2	6.4	3.6	-43.8%

a/ Total killed and wounded in action.
b/ Total combat deaths.

D. Support Requirements of Forward Deployments

In the event of NATO mobilization, the preponderance of forces deployed from CONUS to Europe initially are tactical maneuver units and supporting firepower and combat engineer battalions. Thus, the in-country support forces with minor augmentation must sustain the administrative, logistical, and medical base for a rapidly expanded tactical force in intense warfare before major increments of follow on support units are deployed. Most of the forces of other nations are deployed within or in very close proximity to their own borders. In other words, the price of distance is additional support.

There are, moveover, U.S. forces in Europe which are there for purposes other than supporting the combat divisions. These include long range missile units (Pershing and Sergeant), the Berlin Brigade, theater air defense units, and Army strategic intelligence and communications units which are part of the total defense system.

General Support Size and Cost

The Defense program for FY 73 provides for 7.5% fewer military personnel in General Support jobs than in FY 64, as shown in the table below:

MILITARY AND CIVILIAN MANPOWER IN GENERAL SUPPORT, FY 64 AND FY 73 (000)

	FY 64	FY 73	Per Cent Change
Military	1208	1116	- 7.5%
Civilian	941	915	- 2.8%
TOTAL	2149	2031	- 5.5%

While the total number of military and civilian people in General Support has declined, the relative percentage of General Support manpower to total Service manpower has increased slightly from 56 per cent in FY 64 to 58 per cent in FY 73. While the percentage of military manpower in General Support has also increased since FY 64 (45 to 47%), it has remained stable since FY 68. The increase in General Support manpower since FY 64 is attributed to several factors:

Real changes in the level of support being provided, as in medical care for active duty personnel and their dependents, as well as retirees and their dependents.

. More rapid reductions in force units than are possible in the General Support base. For example, from FY 64 to FY 73 the active Navy fleet declines from about 932 ships to 594, with large reductions in mission forces and total Navy manpower. The number of major active CONUS ports, however, remains constant at eight (four on each coast) and 10 shipyards have stayed open. While some of the manpower at each port and shipyard could be released, there are certain fixed requirements which must be met regardless of the number of ships in the active fleet.

In addition, we can more easily activate forces than open bases. A recent Air Force study has shown opening a closed undergraduate pilot training facility costs two-to-three times the annual cost of operating the facility, and rehiring skilled civilians may be extremely difficult. Moreover, the air space reverts to civilian control (FAA) when a base is closed, further hampering attempts to reopen the base to meet new military requirements.

. Better identification of support manpower. To illustrate, all Services except the Air Force have maintained in the General Support category an account for "transients," personnel who are moving between two permanent units. The Air Force established a transient account in FY 71; about 10,300 billets are shown in this account in FY 73.

In addition, there are external factors which affect the size and cost of General Support. These are principally constraints which emanate from both national and international economic and political considerations. For example, closing a base, without adequate lead time and preparation of offsetting programs, can have a harsh economic impact in the vicinity of the base. Additionally, there are legislative requirements to retain the level of certain activities (e.g., the size of the Reserves and the number of Naval Districts). These activities require support and must be considered in the overall support plan.

The next table summarizes military manpower in each component of General Support and shows FY 73 civilian strengths for comparison.

GENERAL SUPPORT MANPOWER, TOTAL DOD
(Military and Civilians in Thousands)

	Military			Civilian
Category	FY 71	FY 72	FY 73	FY 73
Base and Individual Support:				
Base Operating Support	313	300	294	331
Medical Support	100	95	94	43
Other Individual Support	167	118	119	11
Sub-Total	580	514	507	385
Training	551	460	458	40
Command	138	129	121	95
Logistics	30	30	31	395
TOTAL GENERAL SUPPORT	1300	1133	1116	915

The components of General Support will be discussed next in detail; they are Base and Individual Support, Training, Command, and Logistics.

Base and Individual Support

This category includes the functions and resources needed to support the base structure and to provide various services to the individuals in the force. It is divided into three major subcategories: Base Operating Support, Other Individual Support, and Medical Support.

A. Base Operating Support

The Department of Defense maintains a base structure to provide facilities for:

. Operating forces in wartime (i.e., air bases, ports, etc.)

. Keeping forces in peacetime (i.e., training areas, ranges, hangers, troop housing, etc.)

. Supporting forces (arsenals, depots, shipyards, training centers, schools, research laboratories, etc.)

. Providing services to personnel and dependents (family housing, commissaries, theaters, etc.).

The number and location of bases depends on the size of the force and support structure, the need for strategic presence (proximity of forces to theater of operation), the need for dispersion, and geographic, topographic, economic, and political considerations.

The Department of Defense operates 795 principal installations and activities (493 in the United States, 302 overseas). Of these, 392 (320 in the U.S, and 72 overseas) are major bases. A major base contains 1000 or more permanent party personnel, is self-supporting (i.e., does not depend on another base for its services) and contains a wing, division, or similar force unit or operates a major school (e.g., pilot training). In addition the Army maintains 232 camps (called kasernes in Germany) overseas (excluding Southeast Asia). Camps collectively provide the same services as bases, but individually are much smaller (containing no more than a battalion). Of the total major bases, 107 are manned predominately by civilians. These include supply and maintenance depots, arsenals, shipyards, and other logistical, research and development, and administrative activities.

Base Operating Support (BOS) provides a wide range of services in support of the entire Defense effort. These services are similar to those provided by local government, utilities, and the "service industry" segment of the civilian economy. In Defense, these services can be grouped as follows: (a) services which directly support forces and troops (e.g., airfield operation, wharf operation, food services, payroll activities, and base

supply activities; (b) services needed to maintain the base facilities (e.g., building and road construction and repair, police and fire protection, trash and sewage disposal, utilities); (c) services needed to maintain the standard of living of troops and dependents (e.g., commissaries, exchanges, religious activities, sports and entertainment facilities).

The requirement for manpower to perform all of these base support services is workload dependent. The relationship of workload to manpower is based on engineered standards which are periodically revised by the Services. The manpower required is determined from manning documents covering the various types of services performed.

The level of manpower required in BOS can be viewed as depending on the number of bases and the size of the force supported. The services provided at the bases, and the forces on them, generate workload. The decision to open or retain a base generates a workload that requires a relatively "fixed" number of people (activities such as road repair or electrical power plants are relatively insensitive to the number of people on the base, bur rather depend on the existence of the base). The "fixed" requirements change over time because of policy decisions to provide additional services (i.e., longer commissary hours). For FY 73, the "fixed" portion of BOS manpower ranges from 300 to 800 (military and civilian) per base. This amounts to about 37% of the total BOS manpower in FY 73.

The remaining 63% of BOS manpower depends on the population that is being supported. Thus, it can be viewed as a rate of support (i.e., how many BOS people are needed to support one operating person).

Organizational and operational differences between the Services make inter-Service comparisons of BOS invalid. In the Navy much support is provided by the crews of combat vessels. In the Army support is either organic to the combat unit (i.e., an infantry battalion has food service and supply personnel) or in direct support of a combat unit. However, Air Force flying squadrons have almost no support personnel. They receive the same kind of support from BOS as is provided organically in Army and Navy units. Therefore, BOS manpower directly supports the forces and is designed to be deployed with the forces.

The following table summarizes the base operating support military manpower for FY 71-73, shows total FY 73 funding and indicates the percentage of BOS funds devoted to military personnel:

MILITARY MANPOWER AND TOA, BASE OPERATING SUPPORT
(Manpower in Thousands; TOA in $ Billions)

	Military Manpower			TOA in FY 73	
	FY 71	FY 72	FY 73	Total	% Mil Pers
Army	47(18)	46(18)	45(15)	2.4	16%
Navy	57(15)	55(13)	56(14)	1.3	35%
Marine Corps	24(2)	20(2)	20(2)	.4	37%
Air Force	187(23)	180(23)	173(23)	3.2	43%
DOD TOTAL	313(58)	300(56)	294(54)	7.4	32%

As stated above, BOS provides a wide range of services in support of force maintenance and operation. Because of organizational differences between the Services, it is difficult to determine where resources should appear. Therefore, similar support functions occasionally appear in different Fiscal Guidance categories. As an illustrative example, Field and Theater Army Support units (includes: administrative, civil affairs, legal, finance, maintenance, medical, supply, transportation and military police), Construction, Engineer Battalions, and Combat Area Signal Battalions, provide services similar to Army garrisons (which are in BOS). Similarly, Underway Replenishment Ships, Repair Ships, Tenders, and Mobile Construction Battalions, provide services similar to Naval Stations (which are in BOS). Unlike the Army and Navy, in the Air Force, most base supply and service units (direct mission support) appear in BOS. The figures in parentheses above show the illustrative effect on BOS military manpower levels of fully excluding BOS that is in direct support of mission force programs.

B. Medical Support

Medical Support provides the resources for the operation of Department of Defense "fixed site" medical activities, compensation for dependent and retiree care in non-military medical facilities, and manpower spaces to offset reduced unit manning resulting from lost time for Servicemen requiring extensive hospitalization.

The Department of Defense operates 210 hospitals and approximately 491 dispensaries with a current total of 39,397 operating beds. The Department of Defense operates these medical facilities to provide necessary care for wounded and ill servicemen. Pursuant to Chapter 55, Title 10, U.S. Code, medical care is also provided to persons who are not in the active military. In addition to active military manpower, 7.3 million retirees, dependents, and other beneficiaries are eligible to receive medical care from the Department of Defense. Fifty-two per cent of out-patient care (total out-patient visits in FY 71 were 51.8 million) and 32% of in-patient care provided in military facilities was devoted to dependents and retirees in FY 71.

Many dependents and retirees live in areas where they cannot receive

medical care at military facilities due to distance or because of limited capacity at the medical facility. These people (about 800,000) are reimbursed for a major portion of their medical expenditures through the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS). CHAMPUS comprises approximately 17% of Medical TOA. Expansion of CHAMPUS funding over recent years (561% increase FY 64 to FY 73) has enabled the Defense Department to meet the medical needs of the dependent population and the increasing retiree population (140% increase FY 64 to FY 73 estimate) while increasing military manpower (excluding "patients") in Medical Support only 14%.

The number of people needed to staff medical activities is based on detailed workload studies for each facility. For example, the number of nurses in a hospital depends on patient load, which is based on an estimate of the expected number of patients and the expected duration of illness. CHAMPUS funding is based on the expected average number of claims per person as well as the population utilizing CHAMPUS, and expected inflation of civilian medical costs. A discussion of possible means to obtain more health services from civilian sources will be addressed in a separate report as required by PL 92-129.

Manpower is provided to offset the time lost as a result of servicemen being hospitalized for periods in excess of 90 days during the year. This "patient" allowance is necessary to prevent degradation of unit effectiveness due to the loss of personnel because of wounds or illness. The level of "patients" is based on the level of military manpower and the probability of men being wounded or contracting a hospitalizing illness. The level of "patients" has dropped from 35,200 in FY 68 to 7,600 in FY 73.

The following table shows the manpower levels in Medical Support for FY 71 to FY 73. The decreasing manning level for the Army is primarily the result of decreasing "patient" requirements.

MILITARY MANPOWER AND TOA, MEDICAL SUPPORT
(Manpower in Thousands; TOA in $ Billions)

	Military Manpower			TOA in FY 73	
	FY 71	FY 72	FY 73	Total	% Mil Pers
Army	49	42	39	1.0	41%
Navy	19	18	21	.5	39%
Marine Corps	1	1	1	*	100%
Air Force	31	33	33	.7	52%
DOD TOTAL	100	95	94	2.2	44%

NOTE: * Less than .1 billion.

C. Other Individual Support

This category includes manpower to provide miscellaneous personnel related services and to offset the productivity lost by men in transient or prisoner status. The major components are:

Recruiting and Examining manpower operates recruiting offices, central recruiting activities (e.g., preparation and distribution of mass media advertising) and the Armed Forces Entrance and Examination Stations. The manpower required for these activities depends on the need for new accessions, the draft level, and the average productivity of a recruiter. Efforts to achieve an All Volunteer Force have required increased recruiting efforts. Thus, recruiting manpower has increased as shown below:

RECRUITING AND EXAMINING MANPOWER (000)

FY 64		FY 68		FY 73	
Military	Civilian	Military	Civilian	Military	Civilian
12.5	1.0	13.4	2.9	21.1	5.4

Transients comprise the largest share (69% in FY 73) of Other Individual Support. Additional manpower is needed to offset the productive time lost by "transients" -- personnel engaged in Permanent Change of Station (PCS) moves. This additional manpower is necessary to prevent the degradation of unit effectiveness and readiness resulting from undermanning units. The number of spaces needed is based on the expected number of PCS moves (i.e., the number of operational, rotational, and training PCS moves), and the average duration of the move. It is therefore related to accession, release and rotation policies. During the war in Southeast Asia, a one-year tour has been maintained for military personnel assigned to that region. This tour policy created a substantial turbulence. As forces are withdrawn from Southeast Asia, this turbulence is diminishing, thus reducing the need for transient spaces as shown below:

BUDGETED TRANSIENT MILITARY MANPOWER SPACES (000)

	FY 68	FY 71	FY 72	FY 73
Transients	217.5	140.0	89.6	87.8
% of Total Active Military Manpower	6.1%	5.2%	3.7%	3.7%

Prisoners - Manpower spaces are authorized for "prisoners" to offset expected lost time in units resulting from Servicemen being in extended disciplinary confinement. This additional manpower is necessary to prevent degradation of unit effectiveness due to undermanning. The requirement for "prisoners" is based on the level of military manpower and has remained relatively constant at 0.1% of active manpower.

Other minor activities included in Other Individual Support are Overseas Dependent Education and Military Family Housing. These involve approximately 500 military personnel.

The table below summarizes military manpower for Other Individual Support, shows total FY 73 funding and the percentage of funds used for military personnel.

MILITARY MANPOWER AND TOA, OTHER INDIVIDUAL SUPPORT
(Manpower in Thousands; TOA in $ Billions)

	Military Manpower			TOA in FY 73		
	FY 71	FY 72	FY 73	Total	% Mil Pers	a/
Army	86	56	55	1.1	41%	
Navy	49	33	34	.6	42%	
Marine Corps	21	15	15	.2	56%	
Air Force	11	14	14	.7	18%	
DOD TOTAL	167	118	119	2.6	37%	

a/ Excludes PCS movement costs.

Training

Training is an important element of general support. It consists of the officers, enlisted men and cadets who undergo formal training in the military training establishment, as well as the military personnel who conduct and support training activities.

In order to have a smoothly functioning, efficient and ready military, it is necessary to man it with the right number of men, with the proper skills, at the right time. Producing these trained personnel is the task of the training establishment. The rate at which men must be trained in a given skill is a function of projected skill requirements versus projected skill inventories. If the inventory of men in a skill is not forecast to be as large as the need, new men must be trained. The manpower requirement for trained strength is determined by the force to be manned. The inventory of trained men in a given year is determined by the inventory in the previous year minus the losses to that inventory. The losses in a given year depend heavily on the re-enlistment rate. Because training rates are dependent on losses, reductions in training due to the increased retention rates of a volunteer force will not occur immediately, but rather in future years when the draft induced volunteers have left the force and been replaced by true volunteers.

There are many different types of training. With few exceptions, however, each type of training falls into one of the following categories: recruit, specialized, flight, crew and unit, professional and officer

acquisition. The largest training programs in terms of manpower are recruit, specialized and flight training. The following table summarizes the manpower in these training elements.

SUMMARY TABLE OF TRAINING ELEMENTS
(Military Manpower in Thousands)

	FY 71	FY 72	FY 73
Recruit	198.3	148.7	150.9
Specialized	180.9	152.3	153.6
Flight	56.7	47.4	43.8
Other	114.6	111.5	109.5
TOTAL	550.5	459.9	457.8

Recruit or initial entry training provides new accessions with the basic skills and knowledge necessary to enter the military environment.

The size of the recruit training establishment in a given year is related to the number of active and Reserve Component new accessions in that year. The average length of time a recruit spends in basic training varies according to Service. The Army currently provides 8 weeks and 3 days of basic training at Army Training Centers (ATC) located at 8 bases in the United States.1/ In response to diminishing recruit training loads two bases, Fort Lewis and Fort Campbell, are phasing out their ATC's. About 64% of the Army recruits who graduate from basic training receive immediate advanced individual training (AIT) or combat support training (CST). AIT trainees receive instruction in the combat arms skills whereas CST trainees become clerks, drivers, mechanics, cooks, wiremen or radio operators. AIT/CST trainees are also trained at ATC's and are included in the recruit training account. Navy recruit training is given over a 9 week span at 4 separate bases. One of these recruit training centers is programed to be phased out by end FY 73. All Air Force recruits undergo 6 weeks of training at Lackland Air Force Base, Texas. Marine Corps basic training and infantry combat training (ICT) are currently held at 4 bases for a duration of 12 weeks. However, the Marine Corps plans to reduce recruit/ICT training from 12 to 11 weeks achieving a one man-week savings for all recruit accessions.

The number of personnel required to support a given trainee load in each phase of recruit training is established through military staffing guides which result from work measurement studies and historical experience. In general terms, however, the number of instructors and overhead staff in

1/ Includes WAC basic training (8 weeks) and modified basic training for conscientious objectors (6 weeks).

recruit training is related to the trainee load which is the number of recruit trainees in training per week. This load includes active and reserve personnel. The following table summarizes for each Service the relationship between the average trainee load the number of instructors and staff in recruit training.

RECRUIT TRAINING
(Military Manpower in Thousands)

	FY 71	FY 72	FY 73
Army			
Average Trainee Load	123.8	91.3	105.9
Instructors and Staff	28.7	26.1 a/	26.0
Navy			
Average Trainee Load	18.7	20.7	29.4
Instructors and Staff	1.7	1.8	2.1
Marine Corps			
Average Trainee Load	15.7	15.5	15.5
Instructors and Staff	3.7	4.2	3.9
Air Force			
Average Trainee Load	17.1 b/	12.8	14.8
Instructors and Staff	1.5	1.5	1.7

a/ Recruit training structure temporarily underutilized due to fewer new accessions than planned at the beginning of FY 72.
b/ Reflects a 30 June on board strength inflated by abnormally high accessions in the latter half of FY 71.

Specialized training provides individuals with new or higher degrees of skills to match specific job requirements. Each year a certain percentage of those who graduate from recruit training receive immediate additional specialized training. Therefore, the number of men in the specialized training establishment in a given year is, in general, a function both of the number of new accessions in that year and the number of men already in the Service who require additional training. In addition, foreign military, the Reserve Components and some civilians are trained in specialized training.

In the Army, specialized training takes place at one of 28 schools. At these schools a recruit learns skills necessary to become a radar and microwave repairman, an armament repairman or one of many different categories of technicians. About 24% of the Army recruits who graduate from basic training go directly to specialized training. The percentage of recruits who receive AIT or CST training as opposed to less combat oriented specialized training is diminishing slightly (70% in FY 71, 69% in FY 72 and 67% in FY 73). This reflects a decreasing relative need for combat skills. The average course length for school trained students in the Army is 16.5 weeks.

In the Navy, specialized training for recruits is predicated on the long range requirements for growth and advancement to the E4 grade. In FY 73 about 58% of the recruit training graduates will be given specialized training at approximately 65 schools. This compares with 71% in FY 71 and 67% in FY 72 and results from the fact that the need for men with specialized training has remained relatively constant while the number of recruits has risen. The average course length of schools in specialized training is only 18 weeks, though the range of course lengths is wide depending on the school. The Marine Corps provides specialized training for 57% of the recruit training graduates for an average duration of 2.7 months.

The Air Force provides specialized training at 5 Air Force bases. The percentage of basic training graduates who enter technical training skills varies according to predetermined trained personnel requirements for each Air Force specialty. In FY 73, 82% of those who graduate from basic training will be given specialized training, compared with 80% in FY 71 and 86% in FY 72. The average course length in Air Force specialized training will be 14.8 weeks in FY 73.

The following table summarizes by Service the average student load (average number of students in specialized training per week) and the number of instructors and staff required to support that load. As in recruit training, the number of instructors and staff is related generally to the average student load; however, the actual programing of instructors and staff is done at a much more detailed level.

SPECIALIZED TRAINING
(Military Manpower in Thousands)

	FY 71	FY 72	FY 73
Army			
Average Student Load	47.5	40.3	37.1
Instructors and Staff	31.6 a/	20.0 a/	20.0 a/
Navy			
Average Student Load	53.1	53.5	56.7
Instructors and Staff	19.9	18.8	20.7
Marine Corps			
Average Student Load	19.5	14.1	13.0
Instructors and Staff	5.1	4.2	3.6
Air Force			
Average Student Load	26.2 a/	28.2	29.2
Instructors and Staff	14.1 a/	13.5	13.8

a/ End year strengths.

Flight Training needs are based on the demand for military pilots and navigators. Since the average length of flight training per man is about 50 weeks for pilots, and 38 weeks for navigators, the number of men to be trained in a given year is a function of future requirements and retention rates.

We need enough pilots and navigators to provide (a) crews for the aircraft in the force, (b) instructors and students for the training base, (c) necessary supervision of flying and flying related activities, and (d) a supplement consistent with war assumptions, considering reasonable combat tour lengths and rotation policies. During the late 1960's, requirements increased drastically to meet SEA demands. At the same time, unpopularity of the war and attractive opportunities with the civil airlines produced a drop in retention rates. As a result, flight training rates were increased significantly above pre-SEA levels. Recent events have reversed this trend; force levels and SEA activity rates are being reduced, thereby reducing requirements, while retention rates have improved as a result of military pay raises and the softness of the civilian economy.

The following table summarizes by Service the pilot and navigator training outputs for FYs 71, 72 and 73. Pilot training has decreased by 45% (80% in the Army) while navigator training has remained relatively level. (The Air Force did not surge its navigator training rate until FY 72 due to a lesser demand for navigators than pilots.)

DOD FLIGHT TRAINING PROGRAM
(Training Output)

	FY 71	FY 72	FY 73
Army			
Pilots	4,609	1,900	856
Navy			
Pilots	1,475	1,415	1,440
Naval Flight Officers	638	561	610
Marine Corps			
Pilots	632	485	460
Naval Flight Officers	247	150	100
Air Force			
Pilots	3,867	4,150	3,100
Navigators	1,036	1,200	1,300
TOTALS			
Pilots	10,655	8,050	5,856
Navigators/NFOs	1,921	1,911	2,010

The preparation of individuals for flying a particular type of aircraft is included under the classification of crew and unit training. Also included in this category is formal training which is applied simultaneously to an entire military unit by full time instructors as opposed to unit personnel. Examples of this type of training are the Jungle Warfare School in the Army, the Arctic Warfare School in the Army and Crew Survival School in the Air Force.

Professional training activities include Service operated military schools designed to prepare officers for command or comparable staff duties and technical and scientific degree granting programs conducted both by the military and civilian institutions for the purpose of fulfilling requirements for advanced scientific, engineering, medical and managerial skills. Officer acquisition programs include the Service academies, ROTC, Junior ROTC, and other institutions established for the purpose of procuring and training young officers.

An important function of the military school system is performed by school troops. These are a small group of units located at major school centers which are used for practical training, student field exercises and demonstrations. The only significant recent change in the number of school troops is a reduction of five thousand in the Army in FY 72.

A summary of manpower in training is shown in the table below by Service. Included is the FY 73 estimated cost of training and the percentage of this cost accounted for by military personnel pay and allowances (MILPERS).

TRAINING: MANPOWER AND TOA
(Military Manpower in Thousands; TOA in $ Billions)

	Military Manpower			TOA in FY 73	
	FY 71	FY 72	FY 73	Total	% Mil Pers
Army	261	184	175	2.5	55%
Navy	125	124	131 a/	2.0	53%
Marine Corps	51	45	44	.5	73%
Air Force	112	107	108	1.6	64%
TOTAL DOD	550	460	458	6.6	57%

a/ Increases in Navy training in FY 73 are caused by high losses of four year enlistees that entered the Navy in FY 69, coupled with an essentially level end strength from FY 72 to FY 73.

Command

Command provides manpower for (1) operating headquarters and staffs at and above the level of numbered Army, Air Force Air Division, Navy Ship Division, Navy Air Wing, and Fleet Marine Force; (2) supporting headquarters and staffs (i.e., training, logistics, reserve components, etc.); (3) administrative staffs and support activities (i.e., departmental headquarters, finance centers, data processing centers, etc.); and (4) special activities (i.e., operating Presidential aircraft, Civil Air Patrol, supporting Defense and Federal Agencies, etc.). In general, Command functions are related to the size of the force, the composition of the force, and the organization structure. There is continuing substantial effort to make our command structure more efficient through reorganizations and consolidations. As a result, the level of military personnel in Command activities in the Department of Defense decreases by 12% between FY 71 and FY 73. The results of this effort are shown in the table below:

COMMAND MANPOWER
(Military Manpower in Thousands)

	FY 71	FY 72	FY 73
Army	29(25)	25(22)	24(20)
Navy	36(19)	35(19)	33(18)
Marine Corps	10(7)	9(7)	9(7)
Air Force	64(33)	60(32)	56(29)
TOTAL	138(84)	129(80)	121(74)

Command includes a wide range of headquarters and administrative functions, and a varying number of echelons of organizations for each Service. Because of organizational differences between the Services, it is very difficult to determine where resources should appear. Therefore, similar headquarters and administrative support functions occasionally appear in different Fiscal Guidance categories. For example, the Army includes in land forces the headquarters and support commands of the corps and divisions. Similarly, in the Navy, Task Force Groups, and vessel command staffs are included with Naval Forces. These organizations perform functions similar to those of Numbered Air Forces and Air Divisions which are included in the Command category. The figures in parentheses above show the illustrative effect on Command military manpower levels of fully excluding Command that is in direct support of mission force programs.

It should be noted that Command is not synonymous with "headquarters." Forty-six percent of the military manpower in Command is in headquarters. The balance performs other administrative tasks (e.g., operate Presidential aircraft, audit records, operate computers). On the other hand, there are 19,000 military personnel in headquarters which are not included in the

Command category (e.g., personnel in headquarters of combat units). The level of military manning in Command and Headquarters for each Service for FY 73 is:

COMMAND AND HEADQUARTERS MANPOWER
(FY 73 Military Manpower in Thousands)

	Army	Navy	Marine Corps	Air Force
Command (a + b)	24	33	9	56
a. Administrative Support in Command	13	12	7	36
b. Headquarters in Command	11	22	1	21
c. Headquarters Not in Command	11	2		6
Headquarters (b + c)	22	24	1	28

There are four types of command organizations. The first contains individual billets (rather than organizations) which are outside of the control of the Services. The other three contain the headquarters, administrative and support staffs necessary to accomplish the mission of the various Service organizations.

A. Support Outside of Service

Unified Commands - These organizations are used by the Joint Chiefs of Staff to command and control operating units of all Services in unified and coordinated activities. The Services supply manpower to these commands. Included are North American Air Defense Command, European Command, Pacific Command, Atlantic Command, Alaskan Command, Southern Command, Readiness Command, and airborne command posts.

Defense and Federal Agencies - This category consists of manpower which the Services provide to Defense and Federal Agencies. Organizations included are: Office of the Secretary of Defense, Joint Chiefs of Staff, Defense Intelligence Agency, National Security Agency, Defense Communications Agency, Defense Nuclear Agency, Defense Supply Agency, Selective Service System, Coast Guard, Public Health Service, National Security Council, White House Staff, Central Intelligence Agency, Federal Aviation Administration, National Aeronautics and Space Administration, U.S. Embassies.

B. Operating Commands - These organizations provide Service command and control of deployed (or deployable) forces and forces tasked with the defense of the continental United States. Organizations included are: overseas Army commands, Army Air Defense Command, Navy type commands, Navy fleet commands, Sea Frontiers, Fleet Marine Force commands, Strategic Air Command, Alaskan Air Command, Aerospace Defense Command,

Tactical Air Command, Pacific Air Forces, U.S. Air Forces in Europe, and Military Airlift Command.

C. Support Commands - These organizations provide the administration of training, logistics, and Reserve and National Guard components. Organizations included are Army Materiel Command and Commodity Commands, Air Force Logistics Command and Air Materiel Area Headquarters, Naval Materiel Command and Systems Command, Air Training Command.

D. Administrative Commands and Administrative Support Activities - These organizations provide overall policy formulation and administration of the entire Service, and administration of geographic areas of the United States. Included are departmental headquarters and staffs, Naval Districts, Continental Army Command, CONUS Numbered Armies, and HQ Command USAF. Also included are administrative support activities including: personnel assignment activities, central finance and payroll activities, judge advocate activities, inspector general activities.

The level of manpower in these categories for selected years is:

COMMAND MILITARY MANPOWER (000)

	FY 64	FY 68	FY 71	FY 72	FY 73
Operating Commands	61	76	54	49	47
Support Commands	22	19	12	13	13
Administration	46	47	48	43	38
Unified Commands	5	8	8	7	6
Defense & Federal Agencies[a]	17	20	16	17	17
TOTAL	150	170	138	129	121

a/ Includes about 6,000 military personnel in FY 73 assigned to Intelligence Agencies (e.g., DIA and NSA) discussed in Chapter IV.

The Services continually review their command structure at all levels and attempt to make the most effective use of administrative manpower consistent with necessary control and review procedures through organizations and consolidations.

The following table shows Command funding and the share of Command funding devoted to military personnel:

COMMAND TOA, FY 73
($ Billions)

	Army	Navy	Marine Corps	Air Force	TOTAL
TOA	$1.2	$.9	$.2	$1.3	$3.8
% Mil Pers	23%	38%	48%	52%	36%

Logistics

Logistics includes those centrally managed supply, maintenance and support activities needed to: (1) procure equipment and supplies; (2) store supplies used by the combat forces and keep centralized inventory control of major equipment and spare parts; (3) maintain the approved equipment inventory by repairing, modernizing and overhauling major systems and components (aircraft, tanks, engines, etc.); and (4) provide support services such as printing and laundry.

The cost and manpower needs of our central supply and maintenance programs depend on the size and activity of the combat forces, the amount of logistics support provided at unit and base level, depot maintenance repair rates and the cost of performing the individual supply and maintenance functions. The table below shows the manpower needs of the Services and the Defense Supply Agency based on these criteria.

LOGISTICS MANPOWER STRENGTHS (000)

	FY 71 Actual		FY 72 Estimated		FY 73 Estimated	
	Military	Civilian	Military	Civilian	Military	Civilian
Supply	16	140	16	133	17	130
Maintenance	9	250	9	237	9	230
Logistics Support	5	37	5	35	5	35
TOTAL	30	427	30	405	31	395

In FY 73 about 426,000 people will conduct central supply and maintenance operations for DOD. This work force is composed mainly of civilian employees (93%). Military personnel fill supervisory positions, throughout the supply and maintenance system.

Supply Operations - The personnel employed in supply operations are required to buy, store, distribute, manage, and control the supplies and spare parts used by the Services. In FY 73, approximately 147,000 men and women will perform these operations (17,000 military; 130,000 civilians). The Services' supply manpower requirements are based on the size and activity of the equipment inventories and the amount of

maintenance performed on these equipments (aircraft, ships, tanks). Equipment inventory size and maintenance levels determine the number of parts and supplies needed by the operating units and the repair depots. The larger the equipment inventory, the more parts and supplies are needed to support that inventory. Using standard work measures the Services translate parts and maintenance demands into manpower needs to manage and control the supply system.

Since 1969 (peak-Vietnam) the inventory levels and maintenance demands have continuously declined. The number of civilians in the supply system has therefore been reduced. The number of military men in supply operations has increased slightly over the last two years however. This increase reflects an attempt by the Services to improve their supply and inventory control management system which provides supply services at over 350 depots and control centers world-wide.

Maintenance Operations - The personnel employed in maintenance operations repair, overhaul, and modify the Services' major weapon systems and equipments. In FY 73, approximately 239,000 men and women will perform these operations (9,000 military and 230,000 civilians). Maintenance manpower requirements are based on the size and activity of the equipment inventories (force structure) and the maintenance repair/overhaul criteria established for each type of equipment. Each of the Services have criteria which state the frequency of overhaul/repair for each piece of equipment based on engineering standards and past experience. For example, in FY 73 the Air Force will have 455 B-52's in the force. Based on current standards, the overhaul interval for each B-52 is 36 months. Thus in FY 73, about 151 of these aircraft will require overhaul at the Air Force's B-52 depot maintenance facility. Given the demand for B-52 overhauls, the Air Force then estimates the maintenance manpower required to conduct the overhauls based on B-52 workload planning and personnel productivity factors.

The total demand for maintenance manpower is determined by summing the individual maintenance demands for all equipment to be repaired or overhauled by the Services during the year.

Since the peak Vietnam year (1969) the inventory and activity levels of our force have been decreasing. Thus, maintenance demands have also declined; civilian employee levels have dropped about 20,000 since 1971. Civilians accomplish most of the maintenance workload in the Services' depot facilities. Military manpower levels have remained constant over the same time period, reflecting the Services' desire to maintain effective management control of the more than 100 depot facilities world-wide.

Logistics Support Operations - These support personnel perform a wide variety of tasks throughout the logistics establishment; major tasks include writing and publishing the documents and manuals which describe in detail how to repair/overhaul each piece of equipment in the

DOD and overseeing the shipment of cargo from CONUS and overseas ports. Civilian employees perform the basic work; military men manage and supervise the various service organizations. Based on planned FY 73 workloads, logistics support manpower levels will remain at the FY 72 level.

Summary - Logistics manpower needs are based on the size and activity of the force structure and the extent to which we desire to supply and maintain these forces. More importantly, force capability is directly related to the level of maintenance and supply support provided the forces. Performed work and available stocks (spare parts and supplies) determine the readiness of our forces to deploy to combat. Thus the Services continue to plan a high level of maintenance effort through FY 73 to insure that our forces can carry out their primary mission.

MILITARY MANPOWER AND TOA, LOGISTICS
(Manpower in Thousands; TOA in $ Billions)

	Military Manpower			TOA in FY 73	
	FY 71	FY 72	FY 73	Total	% Mil Pers
Army	10	10	9	2.1	4%
Navy	8	8	8	2.1	4%
Marine Corps	2	1	1	.1	10%
Air Force	10	11	13	2.1	5%
TOTAL DOD	30	30	31	6.9	4%

VI

ECONOMIC ASPECTS OF MILITARY MANPOWER

A. Overview of Manpower Costs

Manpower and directly related costs comprise 56% of the DOD budget in FY 73.[1] The largest single part of manpower costs is expenditures on active military manpower. This chapter presents an overall view of the subject of active military manpower costs. The first part of the chapter outlines a conceptual framework for understanding the manpower support establishment as a system. Viewing the components of the system over time provides a basis for understanding the evolution of military manpower costs to the FY 73 level. The second part covers military pay. The third part of the chapter treats the components of the total system costs of manpower. The cost of manpower is compared to the overall defense budget and to the average military strength. Finally, there is a discussion of the transfer of implicit taxes to explicit defense budget costs as the All-Volunteer Force is implemented.

The traditional view of military manpower costs encompasses only the pay and allowances of military personnel. We shall present an alternative approach that defines the total cost of military manpower; however, to provide perspective, the Military Personnel Appropriation is shown by Service below:

MILITARY PERSONNEL APPROPRIATION
(TOA in Billions)

	FY 64	FY 68	FY 71	FY 72	FY 73
Army	4.2	7.8	8.7	8.2	7.7
Navy	3.0	4.2	6.5	7.0	7.3
Marine Corps	.7	1.4	1.5	1.5	1.5
Air Force	4.4	5.7	4.7	5.1	5.4
Total	12.3	19.1	21.4	21.8	21.8

1/ See Secretary of Defense Report, page 48.

It is useful for the purpose of understanding total system manpower costs to compare expenditures on military manpower to expenditures on weapon systems. Weapon systems spending is done primarily in three stages associated with the life cycle of the system: Research & Development, Acquisition, and Operations & Maintenance. Similarily, manpower expenditures can be viewed in four categories: procurement, training, maintenance and retirement. Viewed this way, manpower costs include the full costs of these activities, not just the pay and allowances of military personnel.

Procurement costs are defined as those incurred in order to acquire a man and effect his transition from civilian life to a minimally trained member of the military establishment. Thus, procurement costs include the total costs of recruiting and examining, the cost of the Armed Services Information and Education Program, the cost of ROTC and Junior ROTC, the cost of ROC, the cost of the three Service academies and the cost of recruit training. Many servicemen undergo additional training to meet military requirements for men with specialized skills. Money allocated towards this end comprises the cost of training. Included in training costs are the salaries of men undergoing training, the salaries of instructors and support personnel and the money required to operate and maintain the physical training establishment. The maintenance cost of a man is defined as the cost of paying and supporting him as an operating unit in the trained military force. The cost of maintenance in a given year includes the pay of all active duty military personnel exclusive of those involved in procurement or training. Additionally included are medical costs, the Overseas Dependent Education Program, Defense Family Housing, the Homeowner's Assistance Program, the cost of PCS moves and the elements of Base Operating Support that support manpower (estimated to be 50% of the total BOS allocation exclusive of military pay). Retirement costs are those incurred in the payment of retirement benefits to retired military annuitants.

The following table shows the appropriations included in the four components of military manpower cost in FY 73.

MILITARY MANPOWER COSTS BY APPROPRIATION
FY 73 SUMMARY
(TOA in Billions)

	Procurement	Training	Maintenance	Retirement	Total
Research & Investment	.09	.93	.94	-	1.96
Operations & Maintenance	.35	.93	4.03	-	5.31
Military Personnel	1.31	2.69	17.84	-	21.84
Reserve Personnel	.06 a/	-	.01 b/	-	.07
Retired Pay Defense	-	-	-	4.36	4.36
Total	1.81	4.55	22.82	4.36	33.54

a/ Includes the pay of students in ROTC, Junior ROTC and ROC.
b/ Includes the cost of reserve medical units.

The table below summarizes the FY 73 military manpower costs by Service:

MILITARY MANPOWER COSTS
FY 73 SUMMARY
(TOA in Billions)

	Army	Navy	Marine Corps	Air Force	Total
Procurement	.96	.37	.18	.29	1.81
Training	1.29	1.67	.31	1.28	4.55
Maintenance	8.36	7.18	1.37	5.91	22.82
Retirement	1.56	1.09	.23	1.48	4.36
Total	12.18	10.31	2.09	8.96	33.54

The above components of military manpower cost are analyzed in detail below. Since military personnel pay is the largest element of each cost component, it will be discussed first.

B. Military Pay

The cost of paying active military personnel currently comprises 67% of total military manpower costs; 76% of all procurement costs, 60% of all training costs and 81% of all maintenance costs. Retirement costs include no military pay. The following table displays over time the costs of active duty military pay and allowances and how these costs are related to the average strength of the military. Also shown is the average yearly salary per man, which is the ratio of total pay costs to the average strength.

MILITARY PAY AND ALLOWANCE COSTS

	FY 64	FY 68	FY 71	FY 72	FY 73
Total Pay & Allowance Costs a/ ($ Billions TOA)	11.47	17.48	19.86	20.28	20.48
Average Military Strength (Millions)	2.69	3.44	2.89	2.54	2.40
Average Cost per Man ($)	4264	5081	6872	7984	8533

a/ Includes pay raises through 1/1/72; does not include permanent change of station travel or support of free world forces.

As the table shows, $9.01 billion more is programmed to be spent paying military personnel salaries in FY 73 than in FY 64. This is an increase of 79%. At the same time strength went down by 290,000 men. The difference between expenditures on pay in FY 64 and FY 73 is attributable to three factors: First, the size of the force has decreased. Second, the pay rates for each grade in the military have gone up. 1/ Third, the distribution of grade levels of both the officer and enlisted force has changed. For example, there are percentage wise more captains and fewer lieutenants in the FY 73 force relative to the FY 64 force. The effect of each of these factors on the difference between the manpower cost of the FY 64 and the FY 73 forces may be derived by sequentially altering the FY 64 force to match the characteristics of the FY 73 force.

The table below shows the cost of maintaining different forces with combinations of FY 64 and FY 73 manpower characteristics.

COMPARATIVE COSTS OF MILITARY PAY AND ALLOWANCES

	FY 64	Case 1	Case 2	FY 73
Size (Millions)	2.69	2.40	2.40	2.40
Average Pay Per Man ($)	4264	4264	8000	8533
Grade Mix	FY 64	FY 64	FY 64	FY 73
Total Pay & Allowance Costs ($ Billions)	11.5	10.2	19.2	20.5
Percentage Increase Over FY 64 Cost	0.0%	-11.3%	67.0%	78.3%

Reading the table across the columns, left to right, yields the magnitude of effect resulting from the change in each characteristic. The first column starts with the FY 64 programmed pay cost of $11.5 billion. The next column, Case 1, shows the effect of shrinking the FY 64 force to the FY 73 size, but using FY 64 pay rates and grade mix. The third column, Case 2, depicts what total expenditures on pay would be if the FY 73 force was paid at FY 73 salaries but with the FY 64 grade mix. This accounts for an additional $9 billion of the FY 73-FY 64 manpower cost difference. The remainder of the cost difference between FY 64 and FY 73 is due to grade creep. There will be relatively more officers and enlisted men of higher grades (and consequently higher salaries) in FY 73 than in FY 64. The cost of this grade mix difference, as shown in the table, is estimated to be about $1.3 billion.

1/ This is partially attributable to the fact that longevity and dependency pay both increased from FY 64 to FY 73.

The table also shows the percentage increase in cost over FY 64 contributed by each characteristic. The conclusion is that increases in pay rates have accounted for the major portion of the military pay cost inflation. The next largest effect is the reduction in cost resulting from a diminished force size in FY 73. The smallest effect, a 6.8% increase in cost, is attributable to changes in grade mix. There are many reasons for this change. The level of the 1964 grade ceilings caused promotion stagnation. During the Vietnam buildup men were promoted more rapidly. The recent rapid force reduction has created a situation where younger lower grade personnel are leaving the force at a much higher rate than higher grade personnel. The combination of Vietnam promotion rates followed by rapid reductions of lower grade personnel, has shifted the grade mix upwards despite slowed down promotions. In addition, increasing technological sophistication has created a demand for higher caliber individuals who cannot be acquired and retained at low grades. Even with the increase of grades, it can be argued that the responsibility of men has increased faster than their pay. For example, in WW II, a jeep was driven and maintained by an E-2. His annual pay was 3.1 times as much as the jeep cost. In 1971, a jeep is driven and maintained by an E-4, but his annual pay is only 1.3 times as much as the jeep costs. In WW II, a tank crew chief was an E-4 and his annual pay was 1/8th the cost of the tank. In 1971, the tank crew chief is an E-6, but his annual pay is 1/27th the cost of the tank.

C. Components of Military Manpower Costs

The following table displays how the four cost components of the military manpower system have varied over time. A description of each cost trend follows.

THE COMPONENTS OF MILITARY MANPOWER COSTS
(TOA in $ Billions)

	FY 64	FY 68	FY 71	FY 72	FY 73
Procurement	.78	1.53	1.52	1.65	1.81
Training	2.25	3.90	4.36	4.54	4.55
Maintenance	13.05	19.71	21.89	22.43	22.82
Retirement	1.21	2.09	3.39	3.93	4.36
Total Manpower Costs	17.29	27.23	31.16	32.55	33.54

Procurement Cost - The cost of manpower procurement in FY 73 is programmed to be about 2.3 times the cost of manpower procurement in FY 64. The reason for this increase may be explained by examining the three periods FY 64-FY 68, FY 68-FY 71, and FY 71-FY 73. The period FY 64-FY 68 spanned the buildup of the Vietnam War. During this period the average strength of the military increased by almost 30%. This massive military buildup required a correspondingly large procurement program in order to achieve the new manpower levels. For example, the cost of basic training essentially doubled from 522 million to 1130 million as a result of the buildup. From FY 68 to FY 71 the average strength in the military declined from 3.4 million to 2.9 million. At the same

time, however, the average yearly salary per man in the military rose from $5081 to $6872. Since military personnel salaries comprise about 76% of the total costs of procurement, the salary increases served to counterbalance the diminishing level of manpower, resulting in the same aggregate cost of procurement. The 290 million increase in procurement cost from FY 71 to FY 73 is due to the programmed salary increases, physical plant improvements and increased expenditures on recruiting that result from our commitment to a Volunteer Service.

Training Cost - The cost of training rose by 73% between FY 64 and FY 68, grew at a relatively slower rate until FY 72, and remained constant from FY 72 to FY 73. In a given year, the pay of active duty military personnel in the training system (including trainees) comprises about 60% of the total cost of training. The other 40% of training cost comes from expenditures on procurement, construction and pay of reserves and civilians. The cost growth in training in the FY 64-FY 68 period was due to the reaction of all these factors to the demands of the Vietnam War for trained military personnel. The FY 68-FY 72 cost growth was largely the result of increased pay for the military personnel in the training establishment.

Maintenance Cost - The cost of military manpower maintenance is primarily attributed to expenditures on military pay. Roughly 80% of the cost of maintenance is comprised of military pay. The 75% increase in maintenance cost from FY 64 to FY 73 is therefore readily explained by the 79% increase in total military pay over the same period.

Retirement Cost - DOD is the only department which includes retirement costs in its budget. Retirement costs of other Departments of the Federal Government are included in a separate fund. Including these costs in the Defense budget tends to distort comparisons, since retirement costs are incurred for past programs, not for the current or future programs represented in the rest of the budget. It is also important to note that retirement costs are the fastest growing of all manpower costs. Expenditures on retirement pay and benefits in FY 73 show a 260% increase over expenditures in FY 64. The reasons for this cost growth are twofold. First, the average number of retired military annuitants has risen from 411,000 in FY 64 to an estimated 937,000 in FY 73, an increase of about 128%. Second, the pay and benefits per man of these annuitants has increased from an average of $2944 per year in FY 64 to an average of $4486 per year in FY 73. This growth, however, is less than the salary growth per man in the active military. Therefore, the reason that retirement costs have demanded an increased percentage share of the manpower budget from FY 64 to FY 73 is attributable to the fact that the number of retirees has grown while the number of active military personnel has diminished.

The relationship of total manpower cost to the entire Defense budget is given below.

RELATIONSHIP OF MILITARY MANPOWER COSTS TO DOD BUDGET
(TOA in $ Billions)

	FY 64	FY 68	FY 71	FY 72	FY 73
Military Manpower Cost a/	17.29	27.23	31.16	32.55	33.54
DOD Budget (TOA)	50.77	75.67	75.10	78.09	83.18
Military Manpower Cost/Budget b/	34.1%	36.0%	41.5%	41.7%	40.3%

a/ These costs are exclusive of appropriations for National Guard, Reserve, and civilian personnel that are not related to supporting active military manpower. Total outlays for pay and related costs, including all National Guard, Reserve and civilian appropriations total $43.5 billion in FY 73 or 56% of total DOD outlays.

b/ The corresponding percentages when measured in outlays rather than TOA show a slight rise from about 38% in FY 71 to about 40% in FY 73. TOA includes current and future planned expenditures whereas outlays only include money expended in a given year and result in part from prior year TOA.

As the table indicates, from FY 64 to FY 71, there has been an average of about 1.1% rise per year in the percentage share of the DOD budget allocated to military manpower costs. Thus, the total manpower cost in these years increased at a slightly faster rate than the overall budget. Conversely, the programmed FY 73 manpower cost is a smaller fraction of the budget than in FY 71. This is in spite of the recent volunteer service military pay raise and reflects the fact that although the rate of growth in manpower cost has diminished since FY 71, the rate of growth in the remainder of the budget has increased.

A further way of viewing the cost of the military manpower system is to consider the relationship of the cost of the manpower system to the number of men in the system. The following table displays the joint evolution of average military strength and the total cost of operational manpower. Also shown for comparison with the previous table is the fraction of the DOD budget allocated to operational manpower. The cost of operational manpower includes procurement costs, training costs and maintenance costs, but excludes retirement costs. Retirement costs in a given year are not logically related to the size of the military in that year.

COST VERSUS STRENGTH

	FY 64	FY 68	FY 71	FY 72	FY 73
Operational Manpower Costs (TOA in $ Billions)	16.08	25.14	27.77	28.62	29.18
Average Active Military Strength (Millions)	2.69	3.44	2.89	2.54	2.40
Operational Manpower Cost/Budget	31.7%	33.2%	37.0%	36.7%	35.1%
Per Capita Cost ($)	5,978	7,308	9,609	11,268	12,158

The per capita cost is the operational manpower cost divided by the average active military strength. This number is an aggregate measure of the cost per man in the military manpower system in a given year. As the table indicates, the cost per man in FY 73 is slightly over twice the cost per man in FY 64. This cost growth reflects pay raises and grade mix differences as well as increased costs of procurement, operations and maintenance, and construction that are included in military manpower costs.

D. Transfer of Implicit Taxes to Explicit Budget Costs

Historically the cost of military manpower has been shared by both the individual soldier and the Department of Defense. It is useful to examine the changing nature of this relationship.

Under a draft system some men are unwillingly inducted into the military. The difference between what these men are paid and the salary necessary to replace them with true volunteers is an imputed tax. It is estimated that the average tax paid by each non-volunteer over his term of service in FY 68 was $5,000. The estimated cost of eliminating this tax in FY 68 by raising military pay would have been $8 billion. 1/ This amount when added to the $19.1 billion military personnel appropriation actually authorized in that year gives a total economic pay cost of $27.1 billion, 70% of which was borne by DOD.

If there had been no military pay raises between FY 68 and FY 73, the FY 73 military personnel appropriation would total roughly $14 billion instead of the actual $21.8 billion. The remaining $7.8 billion is a measure of the cost borne by the DOD budget of removing the resulting imputed tax burden. This cost has two components. The first component, about 70% of the cost of removing the imputed tax, results from the fact that civilian pay rose between FY 68 and FY 73. Across the board military pay raises during that period were designed to keep military and civilian pay in about the same relationship as in FY 68. The second component (about $2.4 billion) results from pay raises designed to attract enough men for an all-volunteer force.

1/ While these costs would have appeared in the DOD budget, the costs to the U.S. Treasury would be less due to increased revenues from income tax.

The pay raises between FY 68 and FY 73 have acted to reduce the imputed tax paid by young people in the military and increase the share of total economic cost borne by DOD. Thus, more manpower costs are explicitly shown in the DOD budget. By end FY 73 the imputed tax will approach zero concurrent with the transition to an all-volunteer force. Except for the draftees in the force from prior years, all men entering the force will do so by choice and so will not be paying an imputed tax. For the first time, the military personnel appropriation ($21.8 billion in FY 73) will approximate the full cost of pay of military personnel.

VII

FORWARD DEPLOYMENTS

A. Rationale for Forward Deployments

We maintain forward deployments of our forces in order to accomplish the following objectives:

1. To help deter aggression by demonstrating to potential enemies and to our allies the U.S. resolve to honor its commitments;

2. To enable the United States to assist our allies in collective defense in the event they are attacked; and

3. To provide the President with the flexibility necessary in responding promptly to contingencies.

At the end of FY 71, we had about 800,000 men stationed overseas, including those in Navy ships. Of the 800,000, approximately 250,000 were in Vietnam or in ships offshore, 300,000 were in Europe and related areas, 200,000 were in the Western Pacific area, and 50,000 were in various other foreign countries and areas.

As the Vietnamization program continues, and as the forces of our allies are further modernized and improved in consonance with the Nixon Doctrine, we may anticipate adjustments in our deployments. However, these changes will be undertaken only after full consultation with our allies, and only when our collective security interests permit.

In determining whether forces are to be deployed overseas or retained in the U.S., a number of factors must be considered. There are clear advantages and disadvantages of overseas deployments, so a balance must be struck for each area which depends on the threat, the military requirements peculiar to the area, costs, and political considerations.

The advantages of forward deployments include:

- Immediate availability in the event of a crisis;
- Greater assurance to our Allies of the firmness of our commitments;
- Greater deterrent to a potential enemy; and
- Reduced requirement for mobility forces.

The disadvantages include:

- Some additional costs related to personnel moves and rotation base;
- Balance of payments costs;
- Potential political problems caused by the presence of large numbers of American personnel in a foreign country; and
- Adverse impact on morale if separated from families.

The advantages of forward deployments are greatest for our land forces. Land forces depend on heavy and bulky weapons and support equipment. Moving large land forces rapidly (e.g., within 30 days) from the U.S. to a conflict area, therefore, requires large and very costly airlift forces, or a mix of airlift and forward positioning of major equipment items. Even if less rapid reinforcement is acceptable, sealift needs could be large.

Tactical air forces are less dependent on forward deployments for immediate employment because additional planes can be quickly flown in during a period of crisis. For this reason, we have forward deployed a relatively smaller percentage of our tactical air forces than ground forces.

Naval forces forward deployed consist primarily of the 6th Fleet in the Mediterranean and the 7th Fleet in the Western Pacific. The 6th Fleet and Air Force tactical units provide the U.S. contribution to Allied defense of the southern NATO flank and serve as a significant counterweight to the Soviet influence in the Mediterranean area. The 7th Fleet as well as Air Force tactical air forces supports our Southeast Asia operations and help protect Taiwan, Japan, and Korea from threats to the sea lanes. Naval forces, with their embarked Marine Amphibious Forces, provide both potential ground and air forces on station during a crisis situation.

The political impact of changes in forward deployment cannot be ignored. Where we have had troops stationed in a particular country for a decade or more, the sudden removal of those troops can have a destabilizing political effect, regardless of the analytical rationale or assurances of continued commitment which may accompany the redeployments.

B. NATO Deployments

U.S. forces deployed in NATO Europe are now our largest overseas deployment. Therefore, they are discussed below in more detail.

We have deployed in the European theater at the present time an Army combat force of 4 1/3 divisions and 29 tactical air squadrons. In addition, many of our CONUS based forces, including Navy ships and especially the dual-

based REFORGER Army units and the CRESTED CAP Air Force units, are firmly committed to NATO. As the President noted in his 1971 Foreign Policy Report, the total assets available to NATO today are substantial because:

> "No token presence could serve our purpose. Our substantial contribution of United States forces -- about 25 percent of NATO's peacetime capabilities in Central Europe -- insures the viability of the strategy of flexible response. It enables us to found Alliance defense on something other than reliance on the threat of strategic nuclear war. It is the basis of our Allies' confidence in us. It links European defense to a common strategy and to the nuclear power of the United States."

The FY 73 Budget provides for the maintenance of our current force capabilities in Europe in order to demonstrate to our European Allies that we are doing our full share in the common defense, and that we expect them to maintain and improve their own forces. This policy is consistent with the President's pledge 3 December 1970, that:

> ".... given a similar approach by the other Allies the United States would maintain and improve its own forces in Europe and would not reduce them except in the context of reciprocal East-West action."

In NATO, the firmness of the U.S. commitment is important for political and military stability. Our Allies will continue to display anxiety about any U.S. reduction in forward deployed forces.

The European countries, like the U.S., are faced with competing demands for their resources, including the skilled manpower necessary to maintain modern arms. The resurgence of concern about the Soviet threat that followed the Czech crisis, the necessity they felt to persuade the U.S. to keep substantial forces in Europe, and the hope for a mutual force reduction with the Warsaw Pact have succeeded in arresting some downward trends in Allied forces and given them a renewed resolve to improve those forces.

At the NATO Ministerial meetings a year ago, European political leaders evidenced a new spirit towards NATO -- one in which our Allies fully recognize the existing realities and resolved on their own to assume more of the defense burden. Three items of particular significance emerged from these meetings. First, the Ministers approved the conclusions and recommendations of the NATO AD-70 Study undertaken during the preceding six months. The Study highlighted the need for more conventional deterrence and pointed out

specific inadequacies in existing NATO capabilities. There was a unanimous feeling that more must be done in the conventional field and that modern and sufficient NATO tactical and strategic nuclear capabilities must be maintained.

Second, while the Ministers reaffirmed the importance they attached to Mutual and Balanced Force Reductions (MBFR), they noted that Warsaw Pact countries have not directly responded to past evidence of NATO interest for such reductions. Consequently, they understandably did not go beyond the previous Rome communique in their treatment of Mutual and Balanced Force Reductions.

Third, concerning burden sharing, as was pointed out earlier, the ten European nations agreed among themselves to provide almost a billion dollars of additional expenditures over the next five years, divided between improvements to their own forces and contributions to an additional infrastructure program for better communications and aircraft shelters. This agreement is the most tangible evidence yet of European recognition that Europe must do more in its own behalf. The agreement also represents the first significant NATO endeavor undertaken solely by European members with the United States playing no direct role. This demonstration of European awareness of strategic, fiscal, manpower, and political realities, and a determination to face them, will be of substantial benefit to both Europe and the United States. This same spirit was maintained during 1971 as our Allies took steps to implement agreed force improvements and to increase defense budgets.

C. Summary of Present and Planned Deployments

The table below summarizes our present and planned deployments:

TOTAL DOD MILITARY MANPOWER BY GEOGRAPHIC LOCATION a/
(Authorized End Fiscal Year in Thousands)

	FY 71 (Actual)	FY 72	FY 73
Total Military Manpower	2,714	2,392	2,358
Total U.S. Territories, Southeast Asia b/	2,214	1,892	1,874
Total Foreign Countries, less Southeast Asia	500	500	484
Western Pacific	169	171	156
Europe and Related Areas	318	319	319
Other Foreign Countries & Areas	13	10	9
Navy/Marine Corps Forces Deployed Afloat - Included in Above Foreign Areas	(62)	(64)	(64)

a/ All geographic areas include Naval and Marine Forces afloat in those areas.

b/ SVN strength as of May 1972 is projected to be 69,000. The exact phasing of further withdrawals has not been decided.

VIII

SUMMARY OF MILITARY MANPOWER REQUIREMENTS

Summary - DOD Military Manpower by Service

Our FY 72 military manpower requirements have been developed by summing the Mission Force, Other Mission and General Support manpower needs discussed in Chapters III-V. This chapter summarized the manpower requirements by Service and describes the method of calculating average strength (man-years).

The following Service summaries, arrayed by Major Mission and Support categories, include civilian manpower programmed for FY 73 for comparative purposes.

ARMY MILITARY MANPOWER REQUIREMENTS
(Active Duty End Strengths in Thousands; End of Fiscal Years)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Mission Forces				
Strategic Forces	6	7	7	7
General Purpose Forces				
Land Forces	562	432	435	35
Mobility Forces	2	1	1	6
Total General Purpose Forces	564	433	435	41
Other Mission				
Intelligence and Security	32	25	20	7
Communications	16	14	13	5
Research and Development	9	9	9	21
Support to Other Nations	15	10	10	3
Total Other Mission Forces	72	58	52	37
General Support				
Base and Individual Support	182	144	139	184
Training	261	184	175	17
Command	29	25	24	45
Logistics	10	10	9	109
Total General Support	482	363	347	355
(Non-Mission Forces General Support) a/	(448)	(330)	(312)	(256)
Total Army	1,123	861	841	440

a/ As was pointed out in Chapters I and V, comparisons among the Services are invalid because of the differences in structure and the resultant differences in defining the components of each Major Mission and Support category. The alternative view of General Support shown in parentheses represents the effect of removing direct support of Major Mission forces from the General Support category. Chapters I, III, and V include a more complete description of this problem.

NAVY MILITARY MANPOWER REQUIREMENTS [a]
(Active Duty End Strengths in Thousands; End of Fiscal Years)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Mission Forces				
Strategic Forces	19	19	19	1
General Purpose Forces				
Land Forces	2	3	3	-
Tactical Air Forces	60	60	65	-
Naval Forces	205	205	194	-
Mobility Forces	3	3	3	10
Total General Purpose Forces	270	271	264	10
Other Mission				
Intelligence and Security	18	15	14	5
Communications	10	10	9	4
Research and Development	8	8	8	39
Support to Other Nations	4	5	5	1
Total Other Mission Forces	41	38	36	49
General Support				
Base and Individual Support	124	107	111	69
Training	125	124	131	10
Command	36	35	33	23
Logistics	8	8	8	159
Total General Support	293	274	283	261
(Non-Mission Forces General Support) [b]	(216)	(199)	(208)	(221)
Total Navy	623	602	602	320

[a] Includes Navy personnel serving with the Marine Corps.
[b] As was pointed out in Chapters I and V, comparisons among the Services are invalid because of the differences in structure and the resultant differences in defining the components of each Major Mission and Support category. The alternative view of General Support shown in parentheses represents the effect of removing direct support of Major Mission forces from the General Support category. Chapters I, III and V include a more complete description of this problem.

MARINE CORPS MILITARY MANPOWER REQUIREMENTS [a]
(Active Duty End Strengths in Thousands; End of Fiscal Years)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Mission Forces				
Strategic Forces	*	*	*	-
General Purpose Forces				
Land Forces	74	78	79	-
Tactical Air Forces	27	27	27	-
Naval Forces	1	1	1	-
Total General Purpose Forces	102	106	107	-
Other Mission				
Intelligence and Security	2	2	2	-
Communications	*	*	*	-
Research and Development	*	*	*	-
Support to Other Nations	*	*	*	-
Total Other Mission Forces	2	2	2	-
General Support				
Base and Individual Support	45	35	35	13
Training	51	45	44	2
Command	10	9	9	2
Logistics	2	1	1	3
Total General Support	108	90	89	20
(Non-Mission Forces General Support) [b]	(79)	(69)	(66)	(9)
Total Marine Corps	212	198	198	20

* Less than 500 spaces.

[a] Includes Marine Corps personnel serving with the Navy.

[b] As was pointed out in Chapters I and V, comparisons among the Services are invalid because of the differences in structure and the resultant differences in defining the components of each Major Mission and Support category. The alternative view of General Support shown in parentheses represents the effect of removing direct support of Major Mission forces from the General Support category. Chapters I, III and V include a more complete description of this problem.

AIR FORCE MILITARY MANPOWER REQUIREMENTS
(Active Duty End Strengths in Thousands; End of Fiscal Years)

	FY 71	FY 72	FY 73	FY 73 (Civilians)
Mission Forces				
Strategic Forces	104	104	102	9
General Purpose Forces				
Tactical Air Forces	79	80	75	13
Mobility Forces	68	60	53	14
Total General Purpose Forces	147	140	128	27
Other Mission				
Intelligence and Security	38	33	31	7
Communications	29	28	27	8
Research and Development	20	19	19	23
Support to Other Nations	2	2	12	1
Total Other Mission Forces	89	82	89	39
General Support				
Base and Individual Support	229	227	221	112
Training	112	107	108	10
Command	64	60	56	23
Logistics	10	11	13	79
Total General Support	415	404	398	225
(Non-Mission Forces General Support) a/	(194)	(193)	(194)	(150)
Total Air Force	755	730	717	300

a/ As was pointed out in Chapters I and V, comparisons among the Services are invalid because of the differences in structure and the resultant differences in defining the components of each Major Mission and Support category. The alternative view of General Support shown in parentheses represents the effect of removing direct support of Major Mission forces from the General Support category. Chapters I, III and V include a more complete description of this problem.

Average Strengths

Throughout this Report we have focused on end strengths when discussing manpower numbers. This is convenient when relating manpower spaces to forces and other units. However, for budget purposes we must deal in man-years (average strength), for it is manyears that we actually pay for. Each Service computes its manyear requirements in the same way; for each month in the fiscal year, the beginning inventory of personnel is adjusted by estimated gains and losses to arrive at an ending inventory. When these separate monthly levels are averaged over the entire year, the result is the average strength or manyears. Since gains and losses fluctuate during the year the annual average strength seldom equals the simple average of the beginning and end year strengths.

The Navy beginning and end year strengths are the same at 602,000. Because of the nature of their month-by-month program, the Navy expects to have an average strength of about 601,000.

The Marine Corps strengths also are unchanged during FY 73, remaining at 198,000. In this case, the average strength also is expected to be 198,000.

The Air Force begins FY 73 at 730,000 and ends at 717,000. A straight-line path between the two points would yield an average of 724,000. Because the Air Force program loses strength more gradually in the early part of the year than a straight-line path would dictate, the Air Force estimates a requirement for an average of 727,000.

Generally the variance between the straight-line average and the programmed manyears is relatively small. However, in the case of the Army's manpower for 1973 the difference is sufficiently large to require more explanation. The Army estimates a requirement for about 870,000 manyears in FY 73 as compared to the straight-line average of the end strengths of 851,000 manyears (from 861,000 to 841,000). The reason for this phenomenon is as follows:

We attempt to follow the basic principle that units authorized to be in the force should be manned with properly trained individuals at approved manning levels. From this principle, we derive two corollaries:

1. When a trained man departs from a unit and leaves the Service, a trained replacement should be available to take his place.

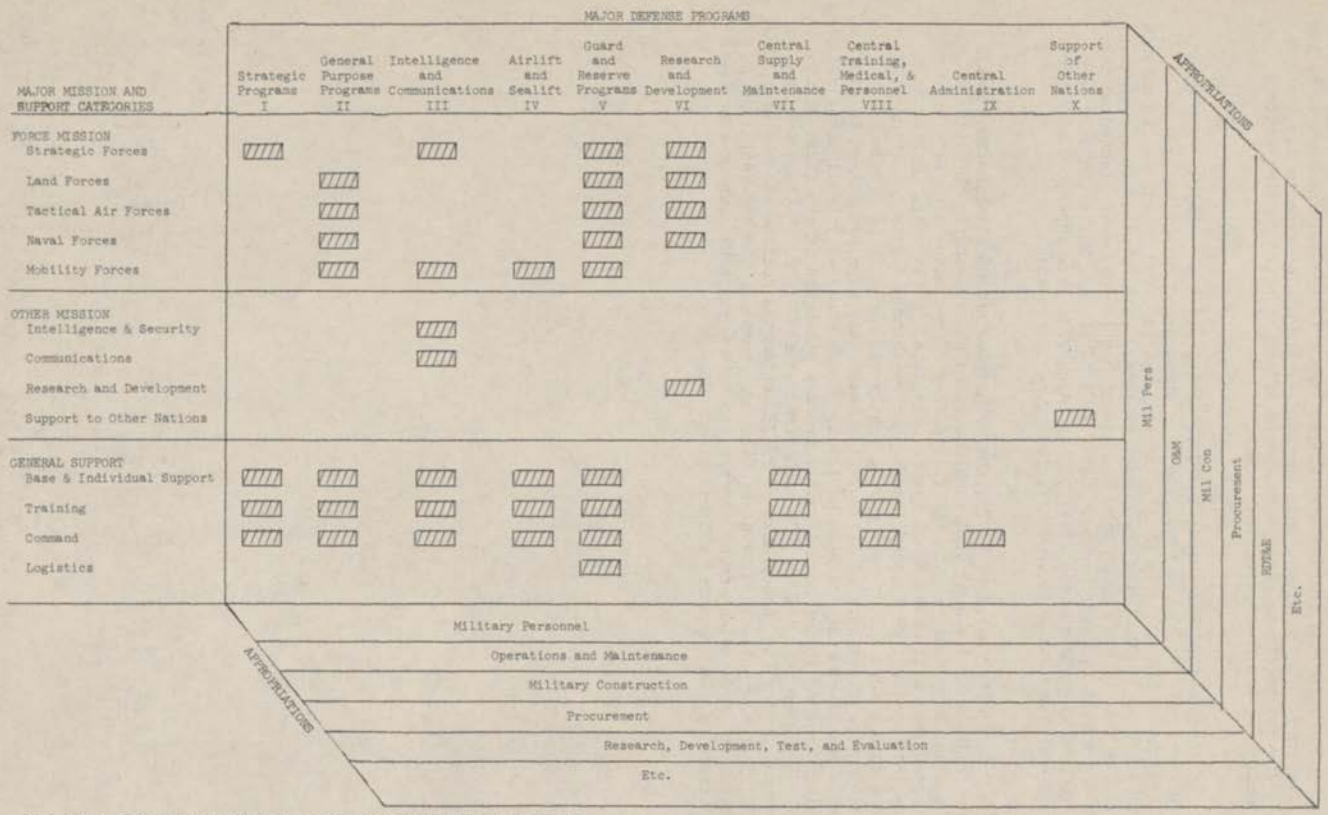
2. Because training takes about five months (longer for many skills), untrained men must be added to the Services five months before losses occur.

The principle and the corollaries cannot be entirely adhered to by the Army in FY 72. To live within the manyear and dollar constraints the Army is forcing people out early and cannot afford to bring in the required numbers of new men to replace them.

Accelerating its losses in FY 72 to bring its average strength down to the limit set by Congress, the Army encountered severe manpower and readiness problems. (In FY 72, the Army was required to reduce its average strength by 50,000 below its budget program. This resulted in a reduction in one year of 262,000 in Army end strength which had been planned to take place over a two year period. Reductions in the Air Force and Navy were 3,000 each.) By the end of FY 72, the Army will have separated some 480,000 men and women, with 316,000 affected by early releases.

At the beginning of FY 73, the principles and corollaries must again be followed or the Army will continue to be understrength. Starting in July the Army must take in the full number of recruits to replace trained losses that will occur about five months later in the year. During this period, however, offsetting losses that would normally be occurring will not take place because many people that would normally be discharged during the first half of FY 73 will already have been discharged in FY 72 as a result of early release policies. These abnormally low losses, combined with a resumption of normal gains, produce strengths in the first half of FY 73 higher than the 861,000 authorized at end FY 72. As losses return to normal during the latter half of FY 73, strengths decline and the Army ends FY 73 at the authorized level of 841,000. However, the mid-year rise in strength produces an annual average strength (manyears) greater than the average of the beginning and end strengths.

RELATIONSHIP OF MAJOR DEFENSE PROGRAMS,
MAJOR MISSION AND SUPPORT FUNCTIONS AND APPROPRIATIONS



Shaded Boxes Indicate Intersecting Cells Which Currently Contain Resources

STRATEGIC FORCES

Unit	Location	Mission	Primary Applicable Treaty	Strategy Supported	Other Potential Deployments
AIR FORCE					
1054 ICBM	CONUS	Deter attack on the U.S. and its allies.	-		None
30 Bomber Squadrons (B-52/FB-111)	1 Guam 29 CONUS[a/]	Deter attacks on the U.S. and its allies.	-	Maintain an adequate second-strike capability to deter an all-out surprise attack on our strategic forces.	
38 Tanker Squadrons	1 SEA 3 - Canada, Spain Alaska 34 - CONUS		-	Provide no incentive for the Soviet Union to strike the United States first in a crisis.	Potential for worldwide contingency deployments on not-to-interfere basis with primary strategic mission.
7 Interceptor Squadrons	CONUS	Restrict unauthorized overflight of U.S. and defend against small bomber attacks with strategic warning of one or two days.	NORAD Agreement	Prevent the Soviet Union from gaining the ability to cause considerably greater urban/industrial destruction than the United States could inflict on the Soviets in a nuclear war.	
NAVY					
41 SSBNs	Charleston, S.C. Rota, Spain Holy Loch, Scotland Guam	Deter attack on the U.S. and its allies.	-	Defend against damage from small attacks or accidental launches.	Worldwide
ARMY					
21 SAM Batteries	CONUS	To back up interceptors in defending against small bomber attacks.			None

a/ Three B-52 squadron equivalents support SEA requirements on a rotational basis.

GENERAL PURPOSE FORCES

ARMY DIVISIONS

UNIT	LOCATION	MISSION	PRIMARY APPLICABLE TREATY	STRATEGY SUPPORTED	OTHER POTENTIAL DEPLOYMENTS
1st Armored Division 3d Armored Division 3d Infantry Division (M) 8th Infantry Division (M) Bde, 1st Inf Division (M)	West Germany	Force presence. In concert with allied and other U.S. forces, stop a Warsaw Pact ground attack and stabilize the military situation without major loss of NATO territory.	NORTH ATLANTIC TREATY A treaty, signed April 4, 1949, by which the partners agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all; and . . . each of them acting in accordance with constitutional processes . . . attacked by taking forthwith individually and in concert with the other partners such action as it deems necessary including the use of armed forces.	Our NATO strategy seeks to deter all forms of aggression against NATO through the maintenance of a full spectrum of nuclear and non-nuclear military capabilities and application of a forward defense concept.	
1st Infantry Division (M) (REFORGER) (minus 1 brigade)	Ft. Riley, Kansas	Early ground combat reinforcement for NATO forces.	North Atlantic Treaty 4 April 1949.	Same as above.	
2d Armored Division 4th Infantry Division (M) 1st Cav Division (TRICAP) 9th Infantry Division 101st Airmobile Division 82d Airborne Division	Ft. Hood, Texas Ft. Carson, Colorado Ft. Hood, Texas Ft. Lewis, Wash. Ft. Campbell, Ky. Ft. Bragg, N.C.	To provide Strategic Reserve and ground forces for worldwide deployment.		These forces are applied to the requirements for meeting minor contingencies and providing for a strategic reserve and assistance to allies.	Worldwide
2d Infantry Divison	South Korea	Force presence. Provides ground combat and security forces for South Korea.	Mutual Defense Treaty, a bilateral agreement, signed October 1, 1953, whereby each party "recognizes that an armed attack in the Pacific area on either of the Parties . . . would be dangerous to its own peace and safety" and that each Party "would act to meet the common danger in accordance with its own constitutional processes."	Forward deployed U.S. forces are an integral link in the spectrum of deterrence and demonstrate to enemies and allies the U.S. resolve to honor commitments. Should an attack occur, these forces allow the U.S. to assist allies in timely defense.	Worldwide
25th Infantry Division	Hawaii	Pacific Command Ground Combat Reserve	SEATO	Provides force for Pacific Area Contingencies. Provides force presence.	Worldwide

GENERAL PURPOSE FORCES

NAVY SHIPS AND AIRCRAFT

UNIT [a]	LOCATION	MISSION	PRIMARY APPLICABLE TREATY	STRATEGY SUPPORTED	OTHER POTENTIAL DEPLOYMENTS
Second Fleet & Western Atlantic 4 CVAs/CVWs 1 CVB/CVBG 77 Surface Combatants 4 Amphibious Ready Groups [b] 10 VP Squadrons Associated Support Ships & Attack Submarines	U.S. East Coast & Western Atlantic	Maintain Atlantic Sea Lanes in NATO conflict. Provide Tactical Air and Amphibious "projection" forces in support of NATO land war. Provide crisis management or contingency force in Atlantic. Provide peacetime naval presence throughout Atlantic.	NATO	Provide for initial defense of NATO Europe. Provide for the protection of naval forces and shipping. Provide a strategic reserve.	Redeployment worldwide possible. Provides capability for rapid reinforcement of NATO in Eastern Atlantic and Mediterranean.
Sixth Fleet 2 CVAs/CVWs 19 Surface Combatants 1 Amphibious Ready Group [b] 2 VP Squadrons Associated Support Ships & Attack Submarines	Mediterranean	Maintain Mediterranean Sea Lanes in NATO conflict. Provide Tactical Air and Amphibious "projection" forces in support of NATO land war, particularly any Warsaw Pact initiatives against the NATO southern flank. Provide crisis management or contingency force in Mediterranean. Provide peacetime naval presence throughout Mediterranean.	NATO	Provide for initial defense of NATO Europe. Provide for the protection of naval forces and shipping. Provide appropriate forward deployment of U.S. forces.	Redeployment worldwide possible. Deployment of entire force elsewhere unlikely due to need of U.S. naval presence in the Mediterranean.
Middle East Force 1 Flagship [c] 2 Surface Combatants [d]	Persian Gulf, Arabian Sea and Indian Ocean	Provide peacetime naval presence in Persian Gulf, Arabian Sea and Indian Ocean. Provide limited contingency force in the area.		Provide appropriate forward deployment of U.S. forces.	Redeployment worldwide possible. Force provides limited military capability.
First Fleet and Eastern Pacific 5 CVAs/CVWs 1 CVB/CVBG 80 Surface Combatants 4 Amphibious Ready Groups [b] 7 VP Squadrons Associated Support Ships & Attack Submarines	U.S. West Coast & Eastern Pacific	Maintain Pacific Sea Lanes in NATO or Asian conflict. Provide Tactical Air and Amphibious "projection" forces to reinforce Western Pacific forces and in support of Asian conflict. Provide crisis management or contingency force in Eastern Pacific and to reinforce Western Pacific forces. Provide peacetime naval presence in Eastern Pacific.	NATO SEATO Various Pacific Mutual Defense & Aid Treaties.	Provide for joint defense of Asia (Korea or Southeast Asia). Provide for protection of naval forces and shipping. Provide a strategic reserve.	Redeployment worldwide possible. Provides capability for reinforcement of either NATO or Western Pacific forces.
Seventh Fleet & Western Pacific 3 CVAs/CVWs 22 Surface Combatants 2 Amphibious Ready Groups [b] 5 VP Squadrons [e] Associated Support Ships & Attack Submarines	Western Pacific	Maintain Western Pacific Sea Lanes in NATO or Asian conflict. Provide Tactical Air and Amphibious "projection" forces in support of Asian conflict. Provide crisis management or contingency force in Western Pacific. Provide peacetime naval presence throughout Western Pacific.	NATO SEATO Various Pacific Mutual Defense & Aid Treaties.	Provide for joint defense of Asia (Korea or Southeast Asia). Provide for protection of naval forces and shipping. Provide appropriate forward deployment of U.S. forces.	Redeployment worldwide possible. Deployment of entire force elsewhere unlikely due to need of U.S. Naval presence in the Western Pacific.

FOOTNOTES

a/ Figures shown are average figures. Forces in the Mediterranean consist of units deployed on a rotational basis from U.S. East Coast homeports. Forces in the Western Pacific consist of units deployed on a rotational basis from U.S. West Coast homeports. Capabilities of individual ship types are discussed fully in the text of the Report.

b/ An Amphibious Ready Group is one-ninth of a Marine Amphibious Force (MAF). It consists of 3 to 5 amphibious ships with a Marine Battalion Landing Team embarked. Only the ARGs forward deployed (in the Mediterranean, the Western Pacific and periodically in the Caribbean) are actually constituted, (the amphibious shipping operated as a squadron with Marine units embarked).

c/ The flagship of the Middle East Force (MIDEASTFOR) is the La Salle, an amphibious assault ship configured for flagship duties, which is homeported at Bahrein in the Persian Gulf.

d/ These forces consist of two destroyers deployed on a rotational basis from U.S. East Coast homeport.

e/ Includes one VP squadron in Alaska.

GENERAL PURPOSE FORCES

MARINE AMPHIBIOUS FORCE (MAF)

UNIT	LOCATION	MISSION	PRIMARY APPLICABLE TREATY	STRATEGY SUPPORTED	OTHER POTENTIAL DEPLOYMENTS
I MAF (1st Marine Division/ 3d Marine Aircraft Wing Team, plus supporting force troops elements.)	Camp Pendleton, Calif/ MCAS, El Toro, Calif. and MCB, 29 Palms, Calif.	Pacific Command Reserve Together with Navy Components of the amphibious team provide ground/air combat forces to project sea power ashore.	SEATO Bilateral Mutual Defense Treaties	Provides forces primarily for Pacific area contingencies. These forces can be applied to the requirements for meeting major or minor contingencies worldwide and providing assistance to Allies.	To NATO/ Worldwide
II MAF (2d Marine Division/ 2d Marine Aircraft Wing Team, plus supporting force troops elements.)	Camp Lejeune, N.C./ MCAS, Cherry Point N.C. and MCAS, Quantico, Va. Fwd deployed units; Guantanamo Bay, Cuba Mediterranean, Caribbean USS Coral SEA (VMA(AW) 244)	Atlantic Command Reserve Provide to CINC's ground/air combat forces with an amphibious forcible entry capability.	NATO	Provides forces primarily for Atlantic and European (NATO) Area contingencies. Provides forward afloat deployed force presence in the Eastern Atlantic/ Mediterranean areas and the Caribbean area. These forces can be applied to the requirements for meeting major or minor contingencies worldwide and providing assistance to Allies	To Pacific Command/ Worldwide
III MAF (3d Marine Division(-)/1st Marine Aircraft Wing Team, plus supporting force troops elements.)	Camp Butler, Okinawa/MCAS, Iwakuni, Japan and MCAS, Futema, Okinawa South China Sea	Pacific Command Reserve. Provides forward deployed combat force in the Western Pacific Provide to CINC's ground/air combat forces with amphibious forcible entry capability.	SEATO Bilateral Mutual Defense Treaties	Provides force for Pacific area contingencies. Provides forward afloat deployed presence in the Western Pacific. These forces can be applied to the requirements for meeting major or minor contingencies worldwide, and providing assistance to Allies.	To NATO/ Worldwide
1st MARINE BRIGADE (Regimental Landing Team 3/Marine Aircraft Group 22, plus supporting force troops elements.)	Marine Corps Air Station, Kaneohe Bay, Hawaii	Pacific Command Reserve. Early reinforcement of forward deployed forces in the Western Pacific. Provide to CINC ground/air combat forces with an amphibious forcible entry capability.	SEATO Bilateral Mutual Defense Treaties	These forces could be applied to meeting minor contingency requirements.	To NATO/ Worldwide

GENERAL PURPOSE FORCES
AIR FORCE TACTICAL AIRCRAFT

Unit (Fighter/Attack Squadron)	Location	Mission	Primary Applicable Treaty	Strategy Supported	Other Potential Deployments
21 Squadrons	U.K., West Germany, Netherlands, Italy, Turkey, and Spain	Provide close air support, gain air superiority, and provide interdiction for a NATO conflict.	NATO	To deter aggression in Europe. To ensure that we have the capability to conduct an initial conventional defense of NATO.	
16 Squadrons	Southeast Asia, Philippines, Okinawa, and Republic of Korea	Provide close air support, gain air superiority and provide interdiction for an Asian conflict.	SEATO Bilateral Mutual Defense Treaties	To deter aggression in Asia. To ensure that we have the capability, in concert with allies, to conduct a conventional defense of Asia against a threat including the PRC.	Can be redeployed worldwide.
35 Squadrons	CONUS, Alaska and Iceland	Provide reinforcement of tactical air capability in Europe and Asia.	-	Europe and Asia Strategies Minor Contingencies	Can reinforce NATO or Asian allies. Can also be used for minor contingencies.

ORGANIZATIONAL AND MANAGEMENT IMPROVEMENTS

Secretary LAIRD. A number of organizational and management improvements—many of them recommended by the blue ribbon defense panel—were made in the past year, notably in the field of intelligence which has been a matter of interest and concern to me for many years.

ESTABLISHMENT OF OFFICE OF ASSISTANT SECRETARY OF DEFENSE FOR INTELLIGENCE

The Office of the Assistant Secretary of Defense for Intelligence was established with responsibility for management of DOD intelligence resources, programs, and activities. A Central Security Service was set up to unify cryptologic and related electronic operations. An Office of Defense Investigations and a Defense Investigative Review Council were established for centralized control of all personnel security investigations. And a Defense Mapping Agency was created to consolidate most mapping, charting, and geodetic operations.

ESTABLISHMENT OF OFFICE OF ASSISTANT SECRETARY FOR TELECOMMUNICATIONS

Another organizational change of the past year was the establishment of the Office of the Assistant Secretary for Telecommunications with responsibility for management and resource allocation.

CHANGES IN TELECOMMUNICATIONS

I need not point out to this subcommittee these assets are extremely large, and DOD telecommunications function involves worldwide operation and about $5.6 billion in capital investment and $2.6 billion in annual appropriations. This new Assistant Secretary of Defense has a very important responsibility in this area. It would be well to include a short passage from my Defense report on the changes we have made in the telecommunications area.

(The information follows:)

3. Telecommunications

The effective management of Department of Defense telecommunications has been a matter of concern to me, of special interest to the Blue Ribbon Defense Panel, and also to the Congress. We all agree that there was a great need for improved management of this function, coordinating the needs of the entire department and consolidating resource management of the entire program. This is needed to help insure reliable, survivable, secure and cost-effective telecommunications for the DOD and the National Communications System.

In order to place telecommunications in proper perspective, I think you may be interested in the fact that the Department of Defense telecommunications function involves worldwide operation and about $5.6 billion in capital investment and $2.6 billion in annual appropriations.

As a first step in providing effective management for telecommunications, I appointed an Assistant to the Secretary of Defense for Telecommunications, who, under the close guidance of former Deputy Secretary David Packard, initiated action to establish Department-wide communications policy and to coordinate the Department's communications efforts. This enabled us to provide improved interim management and to assess the management requirements for the long term.

This past year for the first time, we developed the consolidated Telecommunications Program, which we considered as a single package in our normal planning and programming cycle. This program enabled us to identify telecommunications manpower, resources, and programs throughout the Department of Defense. In addition, we prepared an assessment of the Department of Defense programs and needs for satellite communications. This provided us, for the first time, with an overview of our capabilities and requirements in this important area. One Department of Defense telecommunications program newly established is the jointly manned field agency called TRI-TAC. It has the mission of coordinating the tactical communications requirements and insuring the inter-operability of equipment applicable to joint use by all components of the Department as well as its timely and economical placement in the field.

The additional position of Assistant Secretary of Defense recently authorized by Congress was used for Telecommunications, replacing the office of Assistant to the Secretary established earlier. I will look to the Assistant Secretary (Telecommunications) to lead and guide the future design and development of DOD telecommunications systems, and to assume the OSD responsibility for the telecommunications management, and resource programming and allocation. The Assistant Secretary of Defense (Telecommunications) will also have key OSD functions in connection with the Worldwide Military Command and Control System.

I believe that the changes we have made in the telecommunications area are an effective response to our concern and the concern of the Congress for improved telecommunications management. I am confident that with this new office we will see continued and effective change and improvement in the management of this function.

INTELLIGENCE REORGANIZATION: 1972 CONGRESSIONAL REDUCTION

Senator PASTORE. May I ask a question off the record?

(Discussion off the record.)

Chairman ELLENDER. Back on the record.

Mr. Secretary, reverting to your intelligence reorganization that you spoke about, did that have any connection with the cuts made by this committee last year in intelligence?

Secretary LAIRD. We made the changes after the reductions. In the reductions that were finalized in the fiscal year 1972 request, as you know, we originally asked for $3,784 billion from this committee and through conference they gave us $3,401 billion. This year we asked for $3,515 billion and these increases do not fully cover the cost-of-living increase as far as our personnel is concerned. We have cut back again in this area—when I came in as Secretary of Defense there were 143,000 people in this area. We have through our management reductions and other reductions we are presenting to you in this budget, cut down to 109,000. I think this is a very substantial reduction that we made in cooperation with your committee.

Chairman ELLENDER. The increase is the result of salary increases?

Secretary LAIRD. Yes.

Chairman ELLENDER. Solely?

Secretary LAIRD. Yes, it does not quite take care of all the cost-of-living increases and inflation that is involved. As far as our 1972 column in this budget is concerned, we show a program which is less than you gave us. You gave us $3,401 billion, and we show a program of $3,397 billion.

Chairman ELLENDER. For fiscal year 1973, though, you have asked for $3,515 million?

Secretary LAIRD. That is correct.

Chairman ELLENDER. For the same performance provided last year.

Secretary LAIRD. We are also showing fewer people in fiscal year 1973. We are going from 116,000 that is shown in last year's level to 109,000 in fiscal year 1973.

Chairman ELLENDER. In other words, you saved on personnel, but not on money.

PERSONNEL REDUCTION AND COST INCREASES: INFLATION

Secretary LAIRD. It is very difficult to save money with the pay increases. I realize some of these pay increases were not asked for by the executive branch, but the Congress——

Chairman ELLENDER. You said they were not asked for?

Secretary LAIRD. Yes. But as far as civilian pay increases are concerned——

Chairman ELLENDER. But you know how all of that was done.

(Discussion off the record.)

Secretary LAIRD. People want to know where the peace dividend is going. It is going to manpower. If you look at the 1964 budget, we will have some 300,000 less military people in 1973 than we had in 1964. Yet, in 1964, it cost us about $22 billion. In 1973 it is going to cost us about $43 billion. That is an increase of $21 billion.

The incremental cost of the war in Vietnam was the highest in expenditure terms in fiscal 1969, and that incremental cost was $21.5 billion.

I think sometimes it is well to stop and look at where this money is going, because we talk about cost growth in weapons systems. That looks much smaller when it is compared to the cost growth we have had in the manpower area. I am not condemning it, but I hope that it is understood. I just got through talking with the Governors, and the Governors are concerned about defense spending. I am concerned about defense spending. They do not realize that the real increases in public spending in America since 1964 have not been in defense spending. It has gone up less than 50 percent in that period, but Federal nondefense spending has gone up over 150 percent, and State and local spending has gone up 163 percent.

TOTAL BUDGET INFLATION

Our budget in 1964, that was approved by this committee, was $50.8 billion. If you take just the pay and price increases since then and add them to the $50.8 billion, over that period of time, you need over $32 billion in 1973 to keep up with 1964.

Yet, we are only going to expend around $25 billion more than we did in 1964, so that in real terms what we are buying in defense is $6.6 billion less in 1973 than it was in 1964. In order to develop this subject more fully, I would like if I could, Mr. Chairman to include in the record at this point the chapter of my defense report on defense and the economy, and the accompanying tables.

(The information follows:)

III. DEFENSE AND THE ECONOMY

Defense programs in real terms -- manpower, weapons procurement, the industrial base -- continue their sharp decline through FY 1972. These trends are checked, and in some important respects reversed, with the FY 1973 Budget. This budget includes essential increments to modernize our forces and to stem the long-run growth in manpower costs at the expense of investment. Manpower costs do, in fact, increase substantially from FY 1972 to FY 1973. However, for the first time in many years our appropriation requests for investment increase by an even greater amount than for manpower, and there is good reason to hope that the bulk of the manpower cost increase is now behind us. In addition, the President's Economic Program is slowing the rate of purchase inflation -- another factor which had eroded investment capabilities. These developments are of key significance in appraising the FY 1973 Budget, which lays the groundwork for a significant advance in modernizing our weapons.

A. IMPACT OF PAY AND PRICE INCREASES

To understand recent Defense budget trends, it is necessary to have an appreciation of the impact of pay and price increases -- especially the former -- upon defense spending. These can best be illustrated by using rates of pay for specific grades (bearing in mind that military basic pay and civilian salaries are not comparable) as follows:

	Basic Pay			Salary
Monthly Rates of Pay	E-1 Recruit less than one year of service 1/	E-5 (Sergeant) 4-6 years of service	Colonel or Navy Captain, over 26 yrs svc	Civil Servant GS-11 Step 4
July 1963 (beginning of FY 1964 last prewar yr)	$ 78.00	$205.00	$ 985.00	$ 736.50
January 1972	288.00	429.30	1933.20	1220.08
January 1973 (after pay raises assumed in FY 1973 Budget)	332.10	467.40	2057.40	1279.86
Percent Pay Increase July 1963 to Jan. 1973	325.8%	128.0%	108.9%	73.8%

1/ July 1973 rate shown is for a recruit with less than 4 months service, a pay step that no longer exists. In July 1963, a recruit with over 4 months service received $83.20 per month. Most recruits have less than 4 months service.

To pay a given number of sergeants, for example, it will cost us 128.0% more in January 1973 than it did in July 1963 -- without adding or promoting a man. On a weighted overall basis for the fiscal years as a whole -- recognizing that the pay raises were in effect for parts of fiscal years, and varied among grades -- pay increases may be summarized as follows:

-- For military personnel, a 124.8% increase in basic pay from FY 1964 to FY 1973.

-- For civilian salaries in the classified service, a 64.5% increase from FY 1964 to FY 1973; overall, considering wage boards, civilian pay is up nearly 70%.

In addition to this, there have been increases in some military allowances, and military retired pay has quadrupled -- from $1.2 billion in FY 1964 to $4.9 billion in FY 1973 due to increases in both the rate paid and the number of retirees.

The results are summarized in Table 5. The top part of that table shows a breakdown of our budget in current dollars -- that is, not adjusted for pay and price increases. This is the amount actually spent or planned to be spent. As the table shows, pay and related costs amounted to $22 billion in FY 1964, and rise to $42.8 billion in FY 1973 -- nearly doubling. All other costs rise by $4.9 billion.

The bottom part of the table shows the picture as it would appear if FY 1973 pay rates and price levels had been in effect throughout. For example, the $22 billion in pay and related costs in FY 1964 would have cost $44.7 billion had FY 1973 levels of pay and allowances been in effect in the earlier year. Purchase costs, to buy the same things as were bought in FY 1964, would have been $38.4 billion (33.5% more) at FY 1973 price levels.

Overall, the program that cost $50.8 billion in FY 1964 would have cost at FY 1973 pay and price levels, $83.1 billion -- an increase of $32.3 billion without adding or promoting a man, and without buying a single additional item.

These inflationary factors have been so massive that they completely mask what has been occurring in defense programs. For example:

-- Payroll and related costs increase by $20.8 billion -- nearly doubling -- from FY 1964 to FY 1973, while military and civil service manpower drops by 326,000.

-- From FY 1968 to FY 1973, military and civil service manpower drops by 1,440,000, or 30%; meanwhile, pay and related costs rise by $10.2 billion or 31%.

-- Purchases of goods and services from industry, not adjusted for inflation, dropped from $45.4 billion in FY 1968 to $33.7 billion in FY 1973 -- a drop of 26%. Allowing for inflation, the drop is 39% from FY 1968 and 12% from prewar FY 1964.

-- Defense-related employment in industry is 1,316,000 (41%) below the 1968 level and 423,000 (19%) below the prewar 1964 level.

-- The defense budget as a whole, in constant dollars, is down about 30% from the wartime (FY 1968) peak, and is about 8% below the prewar (FY 1964) level. Defense manpower (military, civil service, and industry) is down nearly 2.8 million (34%) from the FY 1968 level, and is 12% below the prewar (FY 1964) level. In fact, Defense manpower is at lower levels than at any time since before the Korean War.

These facts are certainly not clear if one considers only spending levels measured in current dollars. In these terms, defense spending is about 50% above prewar levels, and indeed has dropped only about 2% from the peak wartime spending levels of FY 1968 and FY 1969. As I have indicated, the major reason for the mismatch between stated defense budget levels on the one hand and real manpower/program trends on the other is manpower cost increases, with purchase inflation playing a smaller role. Before leaving this area, I believe it is important to dwell for a moment upon the reasons for manpower cost increases, and to consider implications for the future. The sharp pay raises of recent years have arisen from four major factors:

-- The comparability pay (government with industry) principle, embodied in law in 1967, caused unusually large pay raises during this period to achieve a one-time "catch-up".

-- Meanwhile, pay raises in industry over this period were themselves very high and government raises, geared to these, were thus further accelerated.

-- FY 1964 pay rates were disproportionately low for the lower military pay grades, the result of a policy followed for many years before 1964, when there were no pay increases at all in those grades. It was not only necessary to abandon this policy during this period under consideration here, but to add large additional amounts ($3.1 billion for FY 1973) to move toward a volunteer force.

-- The retired population grew from 411,000 in FY 1964 to an estimated 937,000 in FY 1973, related to the surge in the military forces during the 1940's, and costs were affected as well by the requirement that new retirees be retired at a proportion of the much higher pay rates, and the statutory requirement that retired pay rates be adjusted for increases in the CPI.

In short, a great many long-standing bills became due during this period, and our manpower cost trends reflect a huge element of one-time catching up. Looking ahead, it is reasonable to expect much more moderate rates of growth in manpower costs. In summary:

-- Pay comparability with the private sector has been achieved;

-- The President's economic program should hold future private sector pay increases to much more reasonable levels than those experienced in the recent past;

-- The inequities regarding personnel in the lower military pay grades have been removed;

-- A large part of the cost of moving to a volunteer force is paid in the FY 1973 Budget, and the rate of increase in retired pay costs should moderate.

We should be past the point where pay costs consume a growing proportion of the Defense Budget, and we can move instead to directing more resources into the critical investment area.

B. A GREATER EMPHASIS ON MODERNIZATION

To this point, we have been discussing the Defense Budget in terms of outlays (spending actual checks issued). In these terms, as Table 5 shows, the mix of the Defense Budget has shifted radically toward manpower costs and away from purchases and modernization. As the table shows, pay and related costs rise from about 43% of defense spending in FY 1964 to about 56% in FY 1973; over that period manpower costs rise by $20.8 billion, nearly doubling, while all other spending rises by $4.9 billion (17%). It is important, though, to remember that this FY 1973 spending mix results to a considerable degree from the budget authority provided for FY 1971 and FY 1972, which is materializing as spending in FY 1973. For ships, aircraft, and other long lead-time items, our FY 1973 spending derives largely from budget authority granted one or two years or more ago. For a look ahead, it is necessary to consider the FY 1973 request for budget authority. Data are presented in Table 6.

This table is arranged somewhat differently than the preceding one. It shows budget authority, rather than outlays, to provide a better look ahead. Incremental war costs are shown separately from baseline costs. Pay and other operating costs are merged, to highlight research and investment trends. I will address my remarks to the lower portion of the table, which shows data in constant (FY 1973 Budget) prices.

In total, defense budget authority rose from $82.8 billion in FY 1964 to $107.3 billion in FY 1968, then falls to approximately the pre-war level in FY 1971-73. The critical point, however, involves the mix within these totals. Note that, in FY 1971, budget authority for research and investment was $27.8 billion in total, compared to $33.3 billion pre-war. Within the FY 1971 total, baseline research and investment funding was $25.4 billion -- about one-quarter below the pre-war level. Note that this situation improves significantly in FY 1972, with baseline investment rising to $27.8 billion. There is an even greater improvement from FY 1972 to FY 1973, but is not shown in the table since war cost estimates cannot be shown separately at this time. It can be noted, also, that total research and investment funding rises by $2.2 billion at constant prices from FY 1972 to FY 1973, and that the baseline increase is greater than that since there is a further drop in war costs.

In recent years, manpower and other operating costs played an increasingly dominant role in the Defense Budget. We are sharply reversing this trend. For example:

	(Budget authority, constant $ billion) FY 1964-71	FY 1971-73
Manpower and Other Operating Costs	$+7.6	$-5.8
Research and Investment	-5.5	+4.2
Total budget authority change, constant prices	$+2.1	$-1.6

Because of the lead times involved, these changes are not reflected in FY 1973 outlays (spending) which are influenced to a significant extent by the budget authority mix of FY 1972, FY 1971, and earlier years. The shift will be clearer in the spending patterns of FY 1974 and later years. The budget authority figures make it clear, however, that the erosion of research and investment funding has been halted, and that the groundwork has been laid to provide a significantly higher level of resources for modernization.

C. MANPOWER TRENDS

Defense manpower trends have had a sharp whipsaw effect on the labor force in recent years, contributing a great deal to employment and unemployment trends. This is illustrated in the labor force data in Table 7. Note that the total labor force will grow about 14.2 million from pre-war 1964 to 1973. This is a record growth, the consequence of the Post World War II baby boom. About 6.8 million of this growth occurred from June 1964 (pre-war) to June 1968 (approximately the wartime peak) and about 7.4 million will occur from June 1968 to June 1973.

Now observe defense manpower trends (military, civil service, and U.S. industry) over this time period. From 1964 to 1968, defense manpower rose by just over 2 million. This meant that 4.8 million additional people became available for jobs aside from direct defense work. From 1968 to 1973, however, defense manpower is cut by nearly 2.8 million, and about 10.2 million people have to find non-defense jobs -- more than twice as many as the 4.8 million in the 1964-1968 period. This combination of record labor force growth and the whipsaw effect of defense manpower trends is obviously a large part of our current unemployment problem.

The public employment figures present another perspective on the same problem. From 1964 to 1968, public employment increased by 3.2 million. From 1968 to 1973, the growth drops to 562,000, with defense cuts largely offsetting the growth in other public employment. The result is that public employment absorbed nearly half of the labor force growth from 1964 to 1968, but less than 10% of the growth from 1968 to 1973.

Putting public employment and Defense-related industry figures together, the picture is as follows:

	(Manpower, Thousands) June 1964 to June 1968	June 1968 to June 1973	June 1964 to June 1973
Change in public employment (See Table 7)	+3,249	+ 562	+ 3,811
Change in Defense-related employment in industry	+ 893	-1,316	- 423
Subtotal	+4,142	- 754	+ 3,388
Private sector jobs required, aside from defense industry	+2,665	+8,164	+10,829
Total labor force change	+6,807	+7,410	+14,217

The private sector of the economy must create 8.2 million additional jobs in the period 1968-73, more than 3 times the number required in the 1964-68 period.

For the long run, these trends are constructive and definitely in the right direction. As Table 7 shows, there will be over 10 million more people available for non-Defense work in 1973 than were available in 1968. The entire growth in the labor force (7.4 million) plus a defense job cutback of 2.8 million are available for civilian pursuits. This is a reallocation of resources in the most elemental sense. In the short run, however, such a massive shift has obviously contributed heavily to our unemployment problems.

Table 7 shows that defense manpower will drop by 2,756,000 from June 1968 to June 1973. In particular, the rate of decline next fiscal year is expected to be one-sixth of what it was in the period FY 1969 to FY 1971. This drop occurs as follows:

	(Thousands)	Average Annual Rate
From June 1968 to June 1971 (FY 69-71)	2,168	723
From July to December 1971 (1st half of FY 72)	243	486
From January to June 1972 (2nd half of FY 72)	222	444
From July 1972 to June 1973 (FY 73)	123	123
For a total of	2,756	1,776

The job cutback (military, civil service, and industry) will continue at a high rate through FY 1972, as the sharp reductions in budget authority for past years continue to have their effect. In the next few months, assuming favorable action on our FY 1973 requests, the cutback rate should sharply diminish.

D. PRIORITIES

Table 7 makes it plain that a massive shift in priorities has already occurred, and that an adequate defense effort imposes a

smaller economic burden upon the nation than at any time for more than 20 years.

While defense spending rises by $25.7 billion from FY 1964 to FY 1973 other Federal spending rises by $107.7 billion -- more than 4 times as much, and state and local spending rises even more. The increases in non-Defense public spending are the equivalent of nearly three complete additional Defense Budgets.

In dollars of constant buying power, Defense spending drops by $6.6 billion over this period; other Federal spending rises by $64 billion, and state and local spending by about $70 billion. This means that the entire real increase in public spending, and about $6.6 billion more, is available for civilian programs.

The entire real increase in the gross national product for these 9 years, and $6.6 billion more than that, is available for civilian pursuits.

By the same token, manpower available for civilian pursuits grows by 15 million from 1964 to 1973 -- the entire labor force growth, plus a 749,000-man defense cutback over the period. This increase of 15 million is nearly three times the total of Defense manpower in 1973, including Defense-related industry employment.

As the lower portion of the table shows, the Defense shares of GNP, of the Federal Budget, and of net public spending are the lowest since FY 1950 -- before the Korean War.

It is quite clear that the period of Defense dominance of manpower and public spending trends has passed. When one looks at the increases in non-Defense public spending and in manpower available for civilian pursuits -- increases which are several times the Defense totals -- it becomes clear that further Defense cutbacks can add relatively little to non-Defense needs. Consider that net public spending will be approaching $400 billion in FY 1973, with GNP at about $1.2 trillion -- up some $200 billion in two years.

Public employment will be over 16 million within a labor force of 90 million. Viewed against these magnitudes, the funds and industry manpower associated with recovering some of the lost ground in the Defense research and investment area are, in relative terms, very small indeed.

TABLE 1

FINANCIAL SUMMARY

(Millions of Dollars)

	FY 1968	FY 1971	FY 1972	FY 1973
Summary by Program				
Strategic Forces	7,270	7,671	7,582	8,846
General Purpose Forces	30,381	24,444	25,655	25,500
Intelligence and Communications	5,534	5,397	5,559	5,802
Airlift and Sealift	1,806	1,376	1,145	1,031
Guard and Reserve Forces	2,206	2,691	3,466	4,111
Research and Development	4,309	5,167	6,166	7,179
Central Supply and Maintenance	8,380	8,354	8,267	8,326
Training, Medical, Other Gen. Pers. Activ.	12,184	14,523	15,250	17,012
Administration and Assoc. Activities	1,235	1,563	1,649	1,806
Support of Other Nations	2,364	3,914	3,348	3,562
Total - Direct Program (TOA)	75,670	75,101	78,089	83,176
Summary by Component				
Department of the Army	24,987	22,596	22,207	22,131
Department of the Navy	20,788	21,886	23,775	25,197
Department of the Air Force	24,967	23,191	23,565	23,549
Defense Agencies/OSD	1,502	1,694	1,772	1,867
Defense-wide	2,751	4,174	4,916	5,466
Civil Defense	86	73	78	88
Military Assistance Program	588	1,487	945	1,347
Military and Civilian Pay Increases and Military Retirement System Reform	-	-	830	3,530
Total - Direct Program (TOA)	75,670	75,101	78,089	83,176
Summary by Functional Classification				
Military Personnel	19,939	22,625	23,385	24,656
Retired Pay	2,093	3,389	3,931	4,860
Operation and Maintenance	20,907	20,410	20,872	21,218
Procurement	22,614	17,865	18,884	19,313
Research, Development, Test, & Evaluation	7,268	7,189	7,791	8,599
Special Foreign Currency Program	-	8	-	-
Military Construction	1,560	1,330	1,316	2,061
Family Housing and Homeowners Asst. Program	613	724	875	1,029
Civil Defense	86	73	90	92
Military Assistance Program	588	1,487	945	1,347
Total - Direct Program (TOA)	75,670	75,101	78,089	83,176
Financing Adjustments	732	-2,214	-945	202
Budget Authority (NOA)	76,402	72,887	77,144	83,378
Outlays	78,027	75,545	75,800	76,500

TABLE 2

SUMMARY OF SELECTED ACTIVE MILITARY FORCES

	Actual	Estimated	
	June 30, 1971	June 30, 1972	June 30, 1973
Strategic Forces:			
Intercontinental Ballistic Missiles:			
MINUTEMAN	1,000	1,000	1,000
TITAN II	54	54	54
POLARIS-POSEIDON Missiles	656	656	656
Strategic Bombers (AAI)	575	512	511
Manned Fighter Interceptor Squadrons	11	9	7
Army Air Defense Firing Batteries	21	21	21
General Purpose Forces:			
Land Forces:			
Army Divisions	13-2/3	13	13
Marine Corps Divisions	3	3	3
Tactical Air Forces:			
Air Force Wings	21	21	21
Navy Attack Wings	12	12	13
Marine Corps Wings	3	3	3
Naval Forces:			
Attack & Antisubmarine Carriers	18	17	16
Nuclear Attack Submarines	51	57	60
Escort Ships	224	226	207
Amphibious Assault Ships	80	77	66
Airlift and Sealift Forces:			
Aircraft Squadrons:			
C-5A	2	4	4
C-133, C-141, C-118, C-124, C-130, C-135	15	13	13
Troopships, Cargoships, and Tankers	93	68	66

TABLE 3
SELECTED MAJOR PROCUREMENT (QUANTITY)

	Fiscal Years			
	65	71	72	73
Strategic Forces				
Navy				
Poseidon Conversions (SSBN)	-	6	6	6
Land Forces				
Army				
Aircraft and Spares				
LOH (OH 6/58)	88	600	400	-
UH-1	759	120	-	-
AH-1	-	70	-	-

	Fiscal Years			
	65	71	72	73
M60A1 Tank (Inc. M60A1E2)	246	300	300 1/	482 2/
U.S. Marine Corps				
Helicopters	138	15	14	44
LVT-7 Family	-	298	468	354
Tactical Air Forces				
Navy and Marine Corps				
A-6E (A-6A in '65)	64	12	12	12
A-7	35	30	24	24
F-4	124	-	-	-
F-14	-	26	48	48
E-2C	-	-	11	8
EA-6B	-	8	12	7
A-4M	-	24	-	-
AV-8A	-	18	30	30
CVAN	-	-	-	-
Air Force				
A-37	-	81	-	-
A-7D	-	88	97	-
F-4	222	24	36	-
F-111	10	12	12	12
RF-4C	128	12	12	-
Int'l Fighter	-	-	21	57
F-15	-	-	-	30
AWACS	-	-	-	3
Naval Forces				
Navy				
Ships				
SSN	6	4	5	6
DLGN	-	1	1	-
DD-963	-	6	7	7
DLG Conv	-	4	2	2
LHA	-	2	-	-
Other Amphibious	10	-	-	-
Support (AS, AFS, ARC, AO, AOR, AD, AE, ATS)	9	-	6	4
Aircraft				
P-3	48	12	24	24
S-3A	-	-	13	42
RH-53D	-	12	18	-
UH-1N	-	-	10	-
PF	-	-	-	1
PHM	-	-	-	2
Mobility Forces				
Air Force				
C-5A	-	-	-	-
C-130E	-	-	12	-
Navy				
Ships (T-AGOR, T-AGS)	2	2	-	-

1/ Includes retrofit of 210 on hand M60A2 tanks.

2/ Includes retrofit of 316 on hand M60A2 tanks.

Table 4
Active Duty Military Personnel,
Civilian Personnel and Reserve Component Strength
(end of fiscal years in thousands)

	1964	1968	1971	1972	1973
Direct-Hire Civilian					
Army 1/	360	462	388	368	367
Navy	332	419	350	334	329
Air Force 1/	305	331	293	279	279
Defense Agencies	38	75	63	60	60
Total 1/	1,035	1,287	1,094	1,041	1,036
Active Duty Military					
Army	972	1,570	1,123	861	841
Navy	667	765	623	602	602
Marine Corps	190	307	212	198	198
Air Force	856	905	755	730	717
Total	2,685	3,547	2,713	2,391	2,358
Reserve Components (in paid status)					
Army National Guard	382	389	402	398	402
Army Reserve	346	312	313	308	312
Naval Reserve	132	131	133	134	133
Marine Corps Reserve	48	48	48	45	46
Air National Guard	73	75	86	89	89
Air Force Reserve	67	46	52	52	56

1/ These totals include Army and Air National Guard Technicians, who were converted from State to Federal employees in FY 1969. The FY 1964 and 1968 totals have been adjusted to include approximately 38,000 and 39,000 technicians respectively.

Table 5
Defense Outlays in Current and
Constant (FY 1973) Prices

($ Billions)

	FY 1964	FY 1968	FY 1972	FY 1973
Current dollars:				
Payroll	$15.7	$23.4	$29.8	$31.3
Other military personnel costs	4.6	6.8	6.1	6.0
Military retired pay	1.2	2.1	3.9	4.9
Family Housing, excluding pay	.5	.4	.6	.6
Total, pay and related	22.0	32.6	40.4	42.8
All other costs (procurement, R&D, construction, supplies & services)	28.8	45.4	35.4	33.7
Total outlays, current dollars	50.8	78.0	75.8	76.5
Constant (FY 1973) Prices:				
Payroll	31.9	38.7	32.8	31.3
Other military personnel costs	7.3	9.9	6.7	6.0
Military retired pay	4.9	4.9	4.9	4.9
Family Housing, excluding pay	.7	.5	.6	.6
Total, pay and related	44.7	53.9	44.9	42.8
All other costs (procurement, R&D, construction, supplies & services	38.4	55.3	36.4	33.7
Total outlays, constant (FY 73)prices	$83.1	$109.2	$81.3	$76.5

NOTE: Detail may not add to totals because of rounding.

Table 6
Defense Budget Authority in Current and Constant (FY 1973) Prices
($ billions)

	FY1964	FY1968	FY1971	FY1972	FY1973
Current prices:					
Pay and other operating costs:					
Baseline force	26.1	33.0	39.6	43.6	
Incremental war costs	-	10.8	7.3	4.6	
Total, pay and other operating costs	26.1	43.8	46.9	48.2	51.3
Research and investment:					
Baseline force	24.5	24.1	23.8	27.0	
Incremental war costs	-	8.5	2.2	1.9	
Total, research and investment	24.5	32.6	26.0	28.9	32.0
Total budget authority:					
Baseline force	50.6	57.1	63.3	70.6	
Incremental war costs	-	19.3	9.6	6.5	
Total budget authority	50.6	76.4	72.9	77.1	83.4
Constant (FY 1973) prices:					
Pay and other operating costs:					
Baseline force	49.5	52.1	48.5	47.9	
Incremental war costs	-	14.9	8.6	5.0	
Total, pay and other operating costs	49.5	67.1	57.1	52.9	51.3
Research and investment:					
Baseline force	33.3	29.8	25.4	27.8	
Incremental war costs	-	10.4	2.4	2.0	
Total, research and investment	33.3	40.2	27.8	29.8	32.0
Total, budget authority:					
Baseline force	82.8	82.0	73.9	75.8	
Incremental war costs	-	25.3	11.0	6.9	
Total, budget authority	82.8	107.3	84.9	82.7	83.4

NOTE: Detail may not add to totals because of rounding.

Table 7
Changing Priorities

	FY 1964 to FY 1968	FY 1968 to FY 1973	FY 1964 to FY 1973
Change (current $ billions) in:			
Defense Spending	$+ 27.2	$- 1.5	$+ 25.7
Other Federal Spending	+ 34.8	+ 72.9	+ 107.7
State and Local Spending	+ 33.1	+ 80.1	+ 113.2
Change (constant FY 1973 $ billions) in:			
Defense Spending	$+ 26.1	$- 32.7	$- 6.6
Other Federal Spending	+ 28.9	+ 35.1	+ 64.0
State and Local Spending	+ 26.9	+ 43.4	+ 70.3
Public Employment (000)			
Defense (includes military)	+1,114	-1,440	- 326
Other Federal	+ 230	+ 93	+ 323
State and Local	+1,905	+1,909	+3,814
Total, Public Employment	+3,249	+ 562	+3,811
Total labor force (000) (June)			
Defense a/	+2,007	-2,756	- 749
All Other	+4,800	+10,166	+14,966
Total Labor Force Change	+6,807	+ 7,410	+14,217

	Defense spending as % of:		
	GNP	Federal Budget	Net public Spending (Federal, State & Local)
FY 1950 (pre-Korea)	4.5%	27.7%	18.7%
FY 1953 (Korea peak)	13.3%	62.1%	46.3%
FY 1964 (last peacetime year)	8.3%	41.8%	28.1%
FY 1968 (SEA peak)	9.4%	42.5%	29.1%
FY 1970	8.2%	38.4%	25.1%
FY 1971	7.5%	34.5%	22.3%
FY 1972	7.0%	31.0%	20.5%
FY 1973	6.4%	30.0%	19.4%

a/ Includes military and Civil Service personnel and Defense-related employment in U.S. industry.

NECESSARY MAINTENANCE OF STRENGTH

Senator YOUNG. Do the Governors listen to you?

Senator PASTORE. You make a very dramatic case but, on the other hand, it is like everything else, one does reach a point of no return. One cannot keep on doing everything. I think in the past we have done a fairly good job in maintaining a strong posture.

The chairman has made an argument that you cannot prove or disprove. His argument is that had we slowed down perhaps they would not have tried too hard to catch up. Whether they would or would not; who knows?

But the trouble is you cannot afford to take that chance. That is one mistake you cannot make. Because there is no returning from that mistake.

Secretary LAIRD. I know when I first came to Congress, my first year, the first meeting I remember was with Speaker Rayburn and John McCormack. I was a freshman member of the Defense Appropriations Committee. The warning that they gave me was, "If you are going to make a mistake on the Defense Appropriations Committee don't make a mistake on the side of weakness, make a mistake on the side of strength."

Senator PASTORE. You remember Congressman Cannon. He would say "no" to anything except the military budget.

PAY INCREASES

Chairman ELLENDER. Mr. Secretary, as I said, I want to take credit for at least trying to prevent the higher costs of the pay to our soldiers. For instance, back in 1963 a private received $78. In 1973 he will get $332.10.

Secretary LAIRD. I am for that increase. I support that. It is an increase of about 325 percent, and I am for that increase because in the free society we live in, it is absolutely essential that we not levy a restrictive tax in the form of nonpayment for service in the military uniforms of our country that we are requiring of certain people through the Selective Service System.

Chairman ELLENDER. But the executive branch desired that because they wanted a volunteer military force.

Secretary LAIRD. I know all about that. And that is why the President of the United States was behind the McGee bill.

Senator ALLOTT. Mr. Chairman, I would like to make one point. I don't think this is necessarily tied to an all-volunteer Army. I think a lot of people have fallen into that trap, both in their speeches and in their thinking. It is a matter of sheer equity and that is all that it is. But one thing is true, you could never achieve a volunteer army without it.

Secretary LAIRD. You cannot necessarily achieve one with it either. This does not insure a volunteer service.

Senator ALLOTT. But you could not achieve it without it. It is not based on whether or not you are trying to push a voluntary Army, in my opinion, and I said this on the floor many times.

Secretary LAIRD. It does relieve a problem. I believe it removes this discriminatory type of tax that was levied upon a lot of our young people. We have used selective service ever since 1941, but the problem here is that in the budget we have before you now, we are spending about the same amount as the Soviet Union in terms of total dollars, but 52 percent of our budget goes for manpower costs.

Chairman ELLENDER. Fifty-six.

Secretary LAIRD. It depends on whether you use budget authority or outlays. In outlays it is up to 56 percent. But in budget authority it is 52. The authority we are asking for amounts to about 52. But whether it is 52 or 56—the overall spending of the Soviet Union is almost the same as ours, but only 30 to 35 percent of it goes to manpower costs.

This is a very serious problem, because they can take 65 to 70 percent of their defense resources and put them into modernization, ship construction and missiles, submarines—as well as operating costs whereas with our budget, not much higher, we can only put around 45 percent of it into these areas. When you stop and realize that the Soviet Union is putting more of its gross national product into national security than we are you look on down the road and see that these manpower costs are going to be a very important factor in defense planning, the most important reality we face.

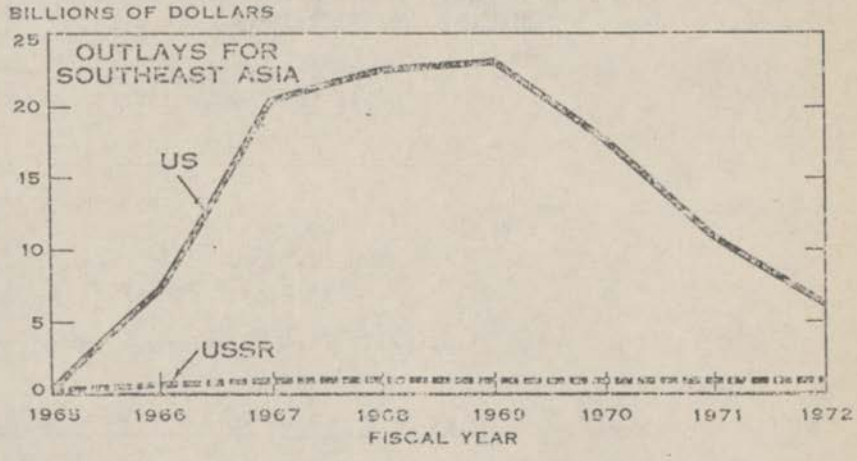
Let me put some charts and material in the record at this point that explain the relative expenditures on manpower in the United States and U.S.S.R., and that also go into a comparison of the relative impact of the war in Vietnam.

(The material follows:)

53% of FY 1972 outlays in the DoD Budget are people-related costs, a figure that will rise to 56% in the FY 1973 Budget. By comparison, only about 30-35% of the Soviet defense budget is devoted to such costs. As a result, when we estimate Soviet personnel expenditures relative to U.S. prices, the USSR starts with a significant advantage in purchasing power available for weapons-related programs, given roughly comparable total Defense budgets. This built-in Soviet advantage has been greatly enhanced at our expense since 1965 because of the costs of the war in Vietnam.

The chart below compares United States and estimated Soviet expenditures in support of the conflict in Southeast Asia since 1965.

RELATIVE IMPACT OF
SOUTHEAST ASIA CONFLICT ON US vs USSR
(IN FY 70 DEFENSE DOLLARS)



The following table estimates United States and Soviet military outlays for operations, procurement and military construction; U.S. Southeast Asia expenditures are shown separately. You will note that from 1965 through 1972 the Soviets have had substantially more funds available to apply to the development of their total military capability. The U.S. on the other hand has been restricted in its ability to invest in more modern and improved military capabilities. Since 1966, when the net available to the Soviet Union first exceeded that for the U.S., the Soviet Union has had some $21 billion more available for modernization than has the U.S. This difference has had a significant and adverse impact on the military posture of the United States relative to that of the Soviet Union.

RELATIVE IMPACT OF SOUTHEAST ASIA CONFLICT ON U.S. VS. USSR 1965-1971

	Soviet Expenditures by Calendar Year (Billion 1970 Dollars)						
	1965	1966	1967	1968	1969	1970	1971
USSR Military Outlays*	49.9	51.6	54.1	56.2	57.2	58.3	59.1
	U.S. Expenditures by Calendar Year (Billion 1970 Dollars)						
U.S. Military Outlays*	53.6	62.7	72.0	73.8	69.8	65.0	60.7
Military Outlays for SEA (including MASF)	3.0	12.7	19.9	20.3	17.7	11.9	6.4
Net Available	50.6	50.0	52.1	53.5	52.1	53.1	54.3

* Excludes RDT&E, Military Assistance and AEC-Type Outlays

The January 1 raise was a comparability pay increase, but the November 14 one was not. Let me put the table I am referring to in the record at this point, along with a short discussion in my defense report.

(The table follows:)

A. IMPACT OF PAY AND PRICE INCREASES

To understand recent Defense budget trends, it is necessary to have an appreciation of the impact of pay and price increases -- especially the former -- upon defense spending. These can best be illustrated by using rates of pay for specific grades (bearing in mind that military basic pay and civilian salaries are not comparable) as follows:

	Basic Pay			Salary
Monthly Rates of Pay	E-1 Recruit less than one year of service 1/	E-5 (Sergeant) 4-6 years of service	Colonel or Navy Captain, over 26 yrs svc	Civil Servant GS-11 Step 4
July 1963 (beginning of FY 1964 last prewar yr)	$ 78.00	$205.00	$ 985.00	$ 736.50
January 1972	288.00	429.30	1933.20	1220.08
January 1973 (after pay raises assumed in FY 1973 Budget)	332.10	467.40	2057.40	1279.86
Percent Pay Increase July 1963 to Jan. 1973	325.8%	128.0%	108.9%	73.8%

1/ July 1973 rate shown is for a recruit with less than 4 months service, a pay step that no longer exists. In July 1963, a recruit with over 4 months service received $83.20 per month. Most recruits have less than 4 months service.

To pay a given number of sergeants, for example, it will cost us 128.0% more in January 1973 than it did in July 1963 -- without adding or promoting a man. On a weighted overall basis for the fiscal years as a whole -- recognizing that the pay raises were in effect for parts of fiscal years, and varied among grades -- pay increases may be summarized as follows:

-- For military personnel, a 124.8% increase in basic pay from FY 1964 to FY 1973.

-- For civilian salaries in the classified service, a 64.5% increase from FY 1964 to FY 1973; overall, considering wage boards, civilian pay is up nearly 70%.

In addition to this, there have been increases in some military allowances, and military retired pay has quadrupled -- from $1.2 billion in FY 1964 to $4.9 billion in FY 1973 due to increases in both the rate paid and the number of retirees.

The results are summarized in Table 5. The top part of that table shows a breakdown of our budget in current dollars -- that is, not adjusted for pay and price increases. This is the amount actually spent or planned to be spent. As the table shows, pay and related costs amounted to $22 billion in FY 1964, and rise to $42.8 billion in FY 1973 -- nearly doubling. All other costs rise by $4.9 billion.

The bottom part of the table shows the picture as it would appear if FY 1973 pay rates and price levels had been in effect throughout. For example, the $22 billion in pay and related costs in FY 1964 would have cost $44.7 billion had FY 1973 levels of pay and allowances been in effect in the earlier year. Purchase costs, to buy the same things as were bought in FY 1964, would have been $38.4 billion (33.5% more) at FY 1973 price levels.

Overall, the program that cost $50.8 billion in FY 1964 would have cost at FY 1973 pay and price levels, $83.1 billion -- an increase of $32.3 billion without adding or promoting a man, and without buying a single additional item.

Table 5
Defense Outlays in Current and Constant (FY 1973) Prices

($ Billions)

	FY 1964	FY 1968	FY 1972	FY 1973
Current dollars:				
Payroll	$15.7	$23.4	$29.8	$31.3
Other military personnel costs	4.6	6.8	6.1	6.0
Military retired pay	1.2	2.1	3.9	4.9
Family Housing, excluding pay	.5	.4	.6	.6
Total, pay and related	22.0	32.6	40.4	42.8
All other costs (procurement, R&D, construction, supplies & services)	28.8	45.4	35.4	33.7
Total outlays, current dollars	50.8	78.0	75.8	76.5
Constant (FY 1973) Prices:				
Payroll	31.9	38.7	32.8	31.3
Other military personnel costs	7.3	9.9	6.7	6.0
Military retired pay	4.9	4.9	4.9	4.9
Family Housing, excluding pay	.7	.5	.6	.6
Total, pay and related	44.7	53.9	44.9	42.8
All other costs (procurement, R&D, construction, supplies & services	38.4	55.3	36.4	33.7
Total outlays, constant (FY 73)prices	$83.1	$109.2	$81.3	$76.5

NOTE: Detail may not add to totals because of rounding.

MILITARY PERSONNEL INCREASES VIS-A-VIS CIVILIAN PERSONNEL

Chairman ELLENDER. Earlier we discussed the increase in the basic pay of a private from $78 per month in July of 1963 to $332.10 in January of 1973—an increase of 325.8 percent. I want the record to show that during that same period the basic pay of an Army colonel increased from $985 per month to $2.057.40—an increase of 108.9 percent. However, during the same period the pay of a GS–11 civilian employee increased from $736.50 per month to $1,279.86 per month—an increase of only 73.8 percent. This indicates to me that we have forgotten the goal of comparability between military personnel and civilian employees.

Secretary LAIRD. The reason those percentages show up that way can be explained. The November 14 pay increase was not a comparability pay increase. That was to make up for certain inequities, particularly in the lower enlisted grades, that had existed over a long period of time, so when you put them into this kind of a table—as I have here on page 291 in my classified statement—you have to explain that the November 14 pay increase was not a comparability pay increase.

EFFECTS OF MILITARY PAY INCREASE

Chairman ELLENDER. It was enacted in order to provide comparability of wages with the military, but then the military received an additional increase.

Secretary LAIRD. But not the November 14.

Chairman ELLENDER. The extra amount was provided and so they are out of balance again. You watch. The civilians will request more money. That is what is going to happen.

Secretary LAIRD. Mr. Chairman, I don't intend to be argumentative about this, but I do feel that a case can be made for it. When these young men were coming in at the $78, at the time you could go to the New York City Police Department and get much more. Now its starting salary, when this pay increase went in, was over $10,000. These people volunteer for that service. We are trying to attract young men to volunteer for military service, and I think that this could be defended in the kind of society in which we live.

Chairman ELLENDER. I don't doubt that it can be, but it certainly has increased the cost to the point where, to sustain the same Army that you had last year would be, as you say, so much more expensive.

Secretary LAIRD. I understand that, and I am concerned about it.

RECRUITING DIFFICULTIES

Senator PASTORE. Even so, despite all these arguments that can be made, isn't there generally a disenchantment on the part of most prospective members of the military forces in reenlisting?

Secretary LAIRD. Yes; we have had difficulties with that. We are improving the situation.

Senator PASTORE. I don't mean only because the pay has been raised.

Secretary LAIRD. We are improving that situation. I think pay is important for many reasons, but the most important thing is the acceptability of military service on the part of young people. The long

war in Vietnam I am sure is a factor. It has not encouraged recruitment, but I think we are over the worst part of that now, and things have been improving for the last few months.

RUSSIAN EXPENDITURES FOR MILITARY MODERNIZATION VIS-A-VIS UNITED STATES

Senator YOUNG. Secretary Laird, you mentioned a while ago the higher percentage that Russia can spend of its gross national product for defense. How much was that?

Secretary LAIRD. As far as their gross national product is concerned their gross national product is about half of ours. In terms of percentage they spend more of their gross national product than we do, but it makes almost a comparable amount as far as the spending is concerned.

The point I was making was that 65 to 70 percent of their defense resources can be used for operations and modernization, and 30–35 percent for manpower, whereas in allocating our defense resources we have to devote 52 percent in terms of budget authority, or 56 percent in terms of outlays, to manpower costs.

COMPETITION BETWEEN NONDISCIPLINED AND DISCIPLINED NATIONS

Senator YOUNG. This raises a question that concerned me greatly. I wonder sometimes if a country like ours—I know we incline in the direction of a welfare State—can compete over the long pull with a well disciplined nation like Russia that can spend a higher percentage of its income on defense.

Secretary LAIRD. This is a problem that we have to recognize. This applies to weapon systems too. I think you all realize that the Vietnam war has had an adverse impact on modernization during that time period. Certainly a significant amount of U.S. resources has been used to modernize our military forces to better deal with the combat situation we faced in Southeast Asia. We have not been able, however, to modernize our forces to the extent that we believe is essential in other parts of the world where the United States has substantial commitments. Aircraft, helicopters, and ground combat equipments for our forces in Europe need to be improved. Major modernization is required in the U.S. Navy. In my view, many of these modernization efforts would have been underway had it not been for the overriding commitment in Southeast Asia. We are now in the process of taking the steps we feel essential to deal with these problems.

Now if you look at the labor cost that is in Soviet weapon systems as compared to the labor cost in our weapon systems, this is a concern. In our weapon systems just the other day I used an example of our fighter aircraft. I am sure all the members of this committee insist we have ejection seat devices on all our fighter aircraft. I think it is important that we have them, but it costs a lot for the system. But the Soviet Union, when it builds a fighter aircraft, doesn't put them in all the aircraft. We have to have them because we just operate a little differently than they do. I still feel that that additional ex-

pense is something we have to face up to, and I think it has the support of the American people, but I use that as an example.

Senator YOUNG. In the past—and I think even now—we have a greater technological knowledge and capability in this country, but we may not always have that.

U.S. SYSTEM ADVANTAGES AND POSSIBLE ARMS LIMITATION AGREEMENT

Secretary LAIRD. Senator Young, I think that in a country like ours that has twice the gross national product of the Soviet Union and is the strongest country in the world economically—and there is just no question about that—we have some problems with the balance of payments, and I don't mean to minimize them, but we are the strongest country economically in the world—and we are going to be paying more for these systems. We are going to be paying higher wages. We are going to have a higher standard of living for our people, and I think that is what this is all about. I feel that is why our people are willing to protect this system until we can move into a period where we can have an arms limitation agreement, where we can have negotiated agreements which mean something. I think this is important.

WORLD MARKET COMPETITION BETWEEN U.S. F–15E AIRCRAFT AND FRENCH MIRAGE AIRCRAFT

Senator YOUNG. Let me ask a question involving trade areas. What is the comparison between the cost of F–5E and the French Mirage aircraft for possible sales in the world market? Would you include that in your comparable research and development cost? Can we compete?

Secretary LAIRD. I will put that in the record at this point. It is very difficult for us to compete because the French industry is subsidized in this area as far as their sales are concerned. But I would be glad to put it in the record, and also the cost of an F–5E. I think that would be interesting.

(The information follows:)

The French are currently promoting the sale of the Mirage F–1 (originally known as the Mirage III E–2). The price of this aircraft is estimated to be $4–5 million, as compared to the F–5E weapon system procurement cost of approximately $2.2 million. Although the prices for the two aircraft do not appear to be competitive, the French aircraft industry is subsidized and therefore the actual price offered for the Mirage F–1 may vary depending upon negotiations.

LIGHTWEIGHT FIGHTER PROTOTYPES

Senator YOUNG. We once had a big market in aircraft of all kinds.

Secretary LAIRD. We are going forward with two prototypes of a lightweight fighter, because we think it is absolutely essential that the prototype program be used in this area so we can develop a less expensive fighter and be on a competitive basis.

Admiral MOORER. The French offer exceptional credit terms for military sales but countries often find that their total costs for systems comparable to ones sold by the United States, including necessary spare parts, are much higher than they would been if they had purchased them from this country.

Chairman ELLENDER. All right, Mr. Secretary, you may proceed.

UNIFIED COMMAND PLAN REVISION: READINESS COMMAND

Secretary LAIRD. The unified command plan was revised to reflect changes in our international policies and to provide a Readiness Command. Several organizational and procedural changes have been made to improve command and control of our military forces, including fixing of responsibility for the operation of the National Military Command System (NMCS).

A Defense Security Assistance Agency was created to direct and administer a program vital to our partnership concept.

I will continue to keep under review proposals for other management changes, such as the possible creation of a strategic command. I believe in connection with our new thinking that it may also be possible to eliminate some additional Headquarters staffing.

COMPARISON OF READINESS COMMAND AND STRIKE COMMAND

Senator YOUNG. How does the readiness command compare with the former strike command? Is there much difference in the operation?

Admiral MOORER. Yes. The strike command had area responsibility in the Middle East. It was called MEAFSA, for the Middle East and Africa. Today the readiness command does not have any area responsibilities. Those have been transferred to the Commander in Chiefs of the European and Pacific areas. The readiness command devotes its entire effort to training and to developing recommendations for new doctrines, procedures, and tactics for the ground actions, that is, Army and Air Force actions.

Senator YOUNG. I believe the strike command had a capability of deploying a division within a matter of a few days.

Admiral MOORER. They had the communications, the staff and the means, and the plans, for that matter, by which they could deploy divisions overseas. This capability was never used in the various crises. The forces were assembled by the strike command and then moved out and immediately turned over to the unified commander in whose area they were going to operate. The Dominican Republic is an example.

Senator YOUNG. We have the same capability now?

Admiral MOORER. Yes. We maintain the same mobile communications and so on, but it would be done through the regular unified command system; area commanders, in other words.

Senator YOUNG. I would think the C–5A would be very helpful in this respect, wouldn't it?

Admiral MOORER. Yes, it would be utilized in an emergency, if necessary.

Senator YOUNG. To the Middle East?

Admiral MOORER. Yes, or to any place in the world.

Senator YOUNG. The strike command was directed more toward the Middle East, wasn't it?

Admiral MOORER. Yes, USCINC MEAFSA had two hats, a training responsibility as well as area responsibility. That particular command becomes a readiness command and deals with readiness and preparation of forces within the United States.

Senator CASE. This is not related to matters concerning the unification of services and the interchange of roles and missions that the Secretary was talking about before?

Admiral MOORER. Not in any way. That was an effort that Secretary Laird took among others, to reduce the size of staffs and streamline the overall command structure. It has nothing to do with roles or missions.

JOINT CHIEFS OF STAFF RESPONSIBILITY

Senator CASE. Or, for instance, having the Air Force take on some of the job, or the Navy?

Admiral MOORER. No, sir. That is not part of that.

Senator CASE. Whose is that responsibility?

Admiral MOORER. That is a JCS responsibility to include in the contingency plans the utilization of the forces with dual capability under different situations. For instance, in the case of the Air Force, it could be used to mine ports, which it did during World War II—the old Army Air Corps, now the USAF, mined the Japanese inland sea and Tokyo Bay and was also used to attack ships at sea.

Senator CASE. This is an ongoing function that people have definite responsibility for?

Admiral MOORER. Yes, that will be handled in the Joint Chiefs of Staff when we structure the contingency plans for various situations. We have a large number of contingency plans to cover the situations we envision could possibly happen.

Chairman ELLENDER. All right, Mr. Secretary, you may proceed.

WEAPONS ACQUISITION

Secretary LAIRD. All of our new national security strategy planning—all of the innovations we are putting into effect—will be undermined if we are not able to continue the progress that has been started in improving our weapons acquisition process. Dave Packard, the former Deputy Secretary of Defense, and I paid close personal attention to the development of better acquisition processes. We said repeatedly that there were not going to be any overnight solutions to these problems—many of which involved programs initiated in the mid-1960's, or earlier. We also acknowledged that, although we are moving to eliminate the causes for the problems we found, we would have to live for a while with the situation we inherited. We knew also that we would make some mistakes. And we have.

But we said we were going to revamp the weapons system acquisition process to minimize the probability of repeating such past procurement mistakes as the "total package concept" used for C–5A procurement. One key change was our decision to go to a much more practical "fly before you buy" approach. Major examples of this approach, compared with the concurrency policies of the past, are the B–1 and the F–15. Some of the troubles we are having with the F–14, in my view, are compounded by the contract approach utilized and its similarity to previous troublesome acquisition strategies.

Our goal in weapons acquition is to achieve an optimum balance among weapons effectiveness, weapons costs, and the timeliness of entry into the inventory. We recognize that we are confronted with the

dilemma of weapons that are too costly if we try to obtain high effectiveness rapidly or weapons, perhaps, of more reasonable cost that have too little effectiveness and become available too late.

Transition Actions

Because national defense is not a stop-and-go proposition but a continuing process, transition actions are required rather than precipitate changeovers.

The Congress knows that I had available to me, early in my service as Secretary of Defense, an option to cancel on a wholesale basis some of the programs which I knew were beset with difficulties. I studied these options very carefully. When I weighed all the factors, including the availability of timely substitutes for the needed defense capabilities represented in those ongoing programs, I rejected the tempting alternative of summary cancellations of many troubled programs. And I told Congress why.

Budget Authorization and Better Return on Investment

This Defense report spells out our needs for $83.4 billion in budget authorization, including some $28 billion for weapons investment. I believe that as a result of the changes we have made, many of them under the leadership of former Deputy Secretary Packard, and many of them reflecting the help and cooperation from the Armed Services and Appropriations Committees, the American people are going to get a better return for their defense dollars.

Status Report of Former Deputy Secretary Packard

But I must say again that we are not out of the woods. Last month I asked Mr. Packard, after he had left office, to give me the benefit of his thoughts on how far we have come and how far we have left to go in this important area. He gave me a no-nonsense report. In essence, he said that he felt we had gone a long way, but he also said there is a tough road ahead.

And I want to say that, thanks to Dave Packard, the road ahead is going to be an easier one.

Organization and Management: Problems and Solutions

I would like to insert into the record at this point the discussion of our problems and solutions in the area of organization and management that is included in my Defense report.

(The excerpt follows:)

I. ORGANIZATION AND MANAGEMENT

In my Defense Report last year, I discussed the concepts of management we have been and are applying in the Department of Defense. The concepts of participatory decision-making, defined and selective decentralization, and delegation of authority under specific guidance remain valid and we are continuing to build upon them.

Application of these management concepts places more emphasis on people and less emphasis on elaborate detailed procedures. Our approach is to define the task, pick a good man, provide guidance to him and the necessary responsibility and authority to do the job.

Our experience demonstrates that people perform better if they play an active role in the decision-making process leading to the policy decision they are responsible for executing.

The members of the JCS and the Secretaries of the Military Departments remain my principal advisers on programs for the Department of Defense. They know that their views are sought and valued; they play an active role in both decision-making and in the management of the Department.

Although we emphasize decentralization of management and have increased the role of the Military Departments and the JCS, there are functions and decisions which necessarily must remain the responsibility of the Secretary of Defense. Some of the changes in organization and management made last year will assure that, as Secretary of Defense, I can better meet my responsibilities and insure better management of the resources provided to the Department.

We should all recognize that new concepts of management cannot solve all of our problems. We should also be aware that the benefits of new and improved management concepts do not accrue immediately but only in time, and that we must continue to carry the products of earlier management well into our Administration.

A. SPECIFIC IMPROVEMENTS IN ORGANIZATION AND MANAGEMENT

In a number of instances, the application of our new management concepts has necessitated additional changes in organization since my report last year. Among the more significant organizational and management changes instituted in the past year are:

-- Establishment of the Office of the Assistant Secretary of Defense (Intelligence).

-- Establishment of the Central Security Service.

-- Establishment of the Defense Investigative Service.

-- Establishment of the Defense Mapping Agency.

-- Disestablishment of the Office of the Assistant Secretary of Defense (Administration).

-- Creation of the Office of the Assistant Secretary of Defense (Telecommunications).

-- Reorganization of the Defense Atomic Support Agency.

-- Reconstituting the Worldwide Military Command and Control System (WWMCCS).

-- Establishment of the position of Director of Net Assessments.

-- Creation of the position of Deputy Director (Test and Evaluation) within the Office of the Director, Defense Research & Engineering.

-- Changes to the Unified Command Structure.

-- Establishment of the Defense Security Assistance Agency.

As you know, we requested Congress last year to establish a second Deputy Secretary of Defense. This important position is crucial to effective and continuing management of the largest government Department in the world. I hope that the Congress will act favorably and very soon in authorizing the establishment of this important position.

Each of the organization changes we have been able to make is significant. I will discuss them in some detail, although not necessarily in the order listed.

1. New Assistant Secretaries of Defense

Several organizational changes were made last year in the Office of the Secretary of Defense. During the course of the year, I disestablished the Office of the Assistant Secretary of Defense for Administration and divided its responsibilities among other Assistant Secretaries. In its place, a new Office of Assistant Secretary of Defense for Intelligence was established.

This Congress has authorized one additional Assistant Secretary of Defense, making a total of eight. This new authorization has been used to establish the Assistant Secretary of Defense for Telecommunications. I will discuss the responsibilities of each of these new offices in greater detail.

2. Intelligence

Before discussing organizational changes, I want to point out important adjustments made in the intelligence program itself. Our basic posture in intelligence continues to be one of readjustment from the operational problems of Southeast Asia to the longer term intelligence needs of our overall strategy. This adjustment must take place simultaneously at several levels among the several Department of Defense intelligence programs which are tasked to provide support. In addition to meeting is own requirements, the Department of Defense performs the bulk of all U.S. intelligence collection

operations in support of national requirements for intelligence. Adjustments in our intelligence resource levels and in the scope and direction of our intelligence efforts must, then, take into account national intelligence needs, Defense intelligence needs for the support of research, development and planning, and the needs of military commanders to maintain intelligence capabilities and assets essential to the conduct of operations.

If there is a single area which deserves particular and increased emphasis in the intelligence arena at this time, it is the provision of support to our research and development community. The growth of technology with potential application to weapons systems is accelerating. The identification, assessment, and reporting of advances in foreign technology and in technological applications to weapons systems to support our own research efforts are of critical importance. We must understand the requirements of our own R&D organizations for this intelligence support and focus our intelligence efforts carefully and purposefully to provide this information.

There is no question that the manpower problem is the greatest challenge to our ability to sustain our intelligence programs at their essential levels of effort and effectiveness. Despite our substantive investments in technical sensors, computers, and other applications of technology to intelligence, manpower remains the largest, and the most critical area of investment in DOD intelligence. From a peak figure of 152,000 in 1969, we will have reduced the manpower in major DOD intelligence programs to less than 117,000 by the end of FY 1972. Since we are faced with a situation in which manpower, our most important resource, is being reduced and limited in numbers, we must get the most effectiveness from present manpower levels. Research and development programs for intelligence systems must be focused on the need to reduce manpower levels and to lessen the dependence of the intelligence effort on high levels of personnel manning.

Since people are our most important intelligence resource, we will improve the career development programs for our military and civilian professionals. We have made some progress in this area of career development but further improvement is needed.

a. The Assistant Secretary of Defense for Intelligence

The most important organizational change in this function during the past year was the appointment of an Assistant Secretary of Defense, with responsibility for management of intelligence resources, programs and activities.

This action continues the emphasis on stronger management of intelligence begun two years ago when the then Assistant Secretary of Defense (Administration), was given additional responsibilities for staff management of the major intelligence resource programs of the Department. Based on the recommendation of the Blue Ribbon Defense Panel and on the experience gained in intelligence resource management under the Assistant Secretary of Defense (Administration), I established the new office of the Assistant Secretary of Defense (Intelligence) on 3 November 1971.

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The Assistant Secretary of Defense (Intelligence) supervises Department of Defense intelligence programs through the entire management cycle, from initial research and development through programming, budgeting, and the final process of follow-up evaluation. In addition, he provides the principal point for management and policy coordination with the Director of Central Intelligence, the CIA, and other intelligence officials and agencies outside the Department of Defense. These arrangements will provide the Assistant Secretary of Defense (Intelligence) with the management tools needed, not only to achieve greater economy, but also to produce a more effective and responsive intelligence effort.

The establishment of the Assistant Secretary of Defense (Intelligence) leaves unchanged the basic responsibilities of DIA and NSA for their respective areas of general intelligence and cryptology. The Assistant Secretary of Defense (Intelligence) will have the OSD staff management overview of both areas, and will coordinate both programs with those of the other Department of Defense intelligence and intelligence-related activities under his purview, including the warning, reconnaissance, and tactical intelligence programs conducted by the Military Departments. The Assistant Secretary of Defense (Intelligence) will also assume responsibility for recommending the requirements and priorities for net threat assessments of foreign weapons systems.

b. Central Security Service

In accordance with the President's desire to consolidate cryptologic activities, we have established a Central Security Service (CSS), under the Director, NSA, who will serve concurrently as the Chief, CSS. The purpose of this new organization is to provide a unified, more economical, and more effective structure for executing cryptologic and related electronic operations previously conducted under the Military Departments. The Military Departments will retain administrative and logistic support responsibilities for the military units involved, but these units will be managed and controlled by the CSS.

c. Defense Investigative Service

In response to the President's directive, we have established a Defense Agency, the Defense Investigative Service, to centralize control of all personnel security investigations and some related matters within the Department of Defense. This is also consistent with the Blue Ribbon Defense Panel recommendations. The Agency is designed to obtain monetary savings, managerial efficiencies and a more prompt response to overall defense needs for personnel security investigations, as well as to provide a more uniform product. At the same time, it will afford another management tool for assuring that investigative activities of the Defense establishment are always conducted with due respect for the rights of all citizens. The new Agency will operate under staff supervision of the ASD(C). It will receive advice and counsel from the Defense Investigative Review Council, which I created last year so that our top level civilian leadership could establish detailed guidance for investigative

activities and assure that these activities are consistent with law and tradition on civil-military relationships.

d. Defense Mapping Agency

Defense mapping, charting, and geodetic operations (MC&G), are being consolidated to the extent practicable, balancing economy against military requirements. For this purpose, we established the Defense Mapping Agency, a separate entity reporting through the Joint Chiefs of Staff to the Secretary of Defense. The functions being consolidated include production, source data storage and retrieval, distribution facilities, and the Topography School -- approximately 75% of total MC&G resources. Data collection and RDT&E will continue as functional responsibilities of the Military Departments, and units providing direct support to field commanders will remain assigned to the Military Departments.

3. Telecommunications

The effective management of Department of Defense telecommunications has been a matter of concern to me, of special interest to the Blue Ribbon Defense Panel, and also to the Congress. We all agree that there was a great need for improved management of this function, coordinating the needs of the entire department and consolidating resource management of the entire program. This is needed to help insure reliable, survivable, secure and cost-effective telecommunications for the DOD and the National Communications System.

In order to place telecommunications in proper perspective, I think you may be interested in the fact that the Department of Defense telecommunications function involves worldwide operation and about $5.6 billion in capital investment and $2.6 billion in annual appropriations.

As a first step in providing effective management for telecommunications, I appointed an Assistant to the Secretary of Defense for Telecommunications, who, under the close guidance of former Deputy Secretary David Packard, initiated action to establish Department-wide communications policy and to coordinate the Department's communications efforts. This enabled us to provide improved interim management and to assess the management requirements for the long term.

This past year for the first time, we developed the consolidated Telecommunications Program, which we considered as a single package in our normal planning and programming cycle. This program enabled us to identify telecommunications manpower, resources, and programs throughout the Department of Defense. In addition, we prepared an assessment of the Department of Defense programs and needs for satellite communications. This provided us, for the first time, with an overview of our capabilities and requirements in this important area. One Department of Defense telecommunications program newly established is the jointly manned field agency called TRI-TAC. It has the mission of coordinating the tactical communications requirements and insuring the inter-operability of equipment applicable to joint use by all components of the Department as well as its timely and economical placement in the field.

The additional position of Assistant Secretary of Defense recently authorized by Congress was used for Telecommunications, replacing the office of Assistant to the Secretary established earlier. I will look to the Assistant Secretary (Telecommunications) to lead and guide the future design and development of DOD telecommunications systems, and to assume the OSD responsibility for the telecommunications management, and resource programming and allocation. The Assistant Secretary of Defense (Telecommunications) will also have key OSD functions in connection with the Worldwide Military Command and Control System.

I believe that the changes we have made in the telecommunications area are an effective response to our concern and the concern of the Congress for improved telecommunications management. I am confident that with this new office we will see continued and effective change and improvement in the management of this function.

4. Defense Nuclear Agency

On 1 July 1971 as another part of our continuing effort to improve defense management and organization, the Defense Atomic Support Agency was reorganized and redesignated the Defense Nuclear Agency (DNA). Our objectives were to insure that DNA activities were realigned to emphasize those functions which are more effectively and economically performed on a centralized basis, to decentralize activities which could be performed better by the military services, to eliminate unnecessary functions and to consolidate support requirements. DNA will continue as a defense agency with the same primary mission but with somewhat reduced functions and personnel. In general, these functions include those requiring unique technical or administrative expertise such as nuclear weapons management, nuclear weapons testing, and nuclear weapons effects research. This action was consistent with the thrust and intent of the recommendation of the Blue Ribbon Defense Panel. We believe this reorganization will result in more efficient overall management of our nuclear program.

5. Unified Command Plan

A major step for improving the command and control of the U.S. combatant forces became effective on 1 January 1972. For the first time since 1963, the Unified Command Plan was revised to reflect changes in our international commitments and policies. This change is in keeping with the Nixon Doctrine and is consistent with our ongoing efforts to revitalize our organizational structure in support of the Strategy of Realistic Deterrence.

The U.S. Strike Command was disestablished and its geographical areas of responsibility assigned to other Commands. In its place a new Command, the U.S. Readiness Command, has been established at MacDill Air Force Base, Florida, with no geographic area of responsibility. It will be manned austerely and its responsibility is to control U.S. based major combatant general purpose forces not assigned to other unified commands. The Readiness Command will have the responsibility to provide a general reserve of combat ready forces to reinforce other U.S. Commands, perform deployment planning, and assist the Joint Chiefs of Staff in developing doctrines and techniques for the joint employment of forces.

The area of responsibility of the U.S. European Command was expanded to include the Red Sea, the Persian Gulf and the Middle East to the eastern border of Iran. This will strengthen the planning capability for defense of the southern flank of NATO and for countering the increased Soviet presence in the Mediterranean and the Middle East. It also insures that all U.S. military planning and operations in Europe will be coordinated and controlled by one commander.

The area of responsibility of the Pacific Command was expanded to include the Indian Ocean to 62 degrees east longitude, those South Asian countries formerly assigned to USCINCMEAFSA, the Aleutian Islands and a portion of the Arctic Ocean. This realigned area of responsibility is more compatible with the forces likely to be deployed for contingencies in these areas.

The area of responsibility for the Atlantic Command was expanded to include the international water areas around the continents of Africa and South America. This arrangement is also more in concert with the existing and likely deployment of U.S. naval forces.

The missions and responsibilities of the Alaskan Command, Strategic Air Command, the Continental Air Defense Command and Southern Command remain essentially the same at this time.

As is true in other areas, we intend to continue to review our worldwide command arrangements in order to insure responsiveness to the President's policies and objectives.

6. Test and Evaluation

The establishment of a Deputy Director for Test and Evaluation within DDR&E with across-the-board responsibilities in OSD for test and evaluation matters is in large part a result of the Blue Ribbon Defense Panel report of mid-1970, which commented extensively on deficiencies with regard to Defense test and evaluation and particularly operational test and evaluation programs. The appointment of the new Deputy Director is a part of our overall program for improvement of systems acquisition management and is improving the timeliness and quality of our testing. His responsibilities include monitoring all DOD testing and advising the Secretary of Defense and the Defense Systems Acquisition Review Council (DSARC) as necessary on test and evaluation matters. His organization is now manned and operating effectively.

The application of these responsibilities, together with other actions we have taken which increase the effect of test and evaluation progress on decisions made on programs following the DSARC process, is having a definite and beneficial impact on a major number of our weapons acquisition programs.

7. Defense Security Assistance Agency

The relationship of security assistance to the Nixon Doctrine, the Strategy of Realistic Deterrence and the Total Force Concept has been further strengthened in the Department of Defense during the past year by two organizational changes.

First, I have established the Defense Security Assistancy Council. The purpose of this council is to advise me on matters relating to security assistance and to provide DOD coordination of this assistance. This council is chaired by the Assistant Secretary of Defense (ISA) with members from JCS, the Director of Defense Research and Engineering, the Office of the Assistant Secretary of Defense (I&L), the Office of the Assistant Secretary of Defense (SA), and the Director of the Defense Security Assistance Agency, who will function as the Secretary. The membership is designed to assure that security assistance meets the requirements of those who would receive the assistance and is still consistent with overall DOD plans, programs, and capabilities.

As a second step, I have established a Defense Security Assistnce Agency (DSAA). The DSAA is the central organization in the Department of Defense responsibile for directing and supervising the execution and administration of approved security assistance programs. In the past, we have found that information on security assistance programs, for a specific country was divided between the OSD staff and the Military Departments. It was difficult and time-consuming to get a complete report on the programs and status of security assistance either by country or area. With the Defense Security Assistance Agency we will now have this capability.

The Director of DSAA is the focal point in the Department of Defense for the administration of approved Security Assistance Programs. He operates in close coordination with the Department of State and under the policy guidance of the ASD (ISA), the Defense Security Assistance Council and, of course, the Secretary of Defense.

Security Assistance is a vital and integral part of the programs of the Department of Defense. The establishment of DSAA assures that Security Assistance will receive the management attention due this critical program.

B. IMPROVEMENTS IN MILITARY OPERATIONS

Our experience with military operations over the past three years has demonstrated that one of the areas that most needed improved management and effectiveness was the command and control of our forces. The problems that we identified in this area were in part the result of a lack of overall management of these resources from the point of view of the entire Department of Defense. I believe that this problem has been satisfactorily met by the establishment of an Assistant Secretary of Defense for Telecommunications. Related problems were: the inadequacy of the internal organizational structure designed to pass messages to the operating commands; the fragmentation of responsibility to manage the particularly critical functions that serve the national command authority in time of crisis; and insufficient emphasis on improving our command and control systems.

All of these problems were the subject of an extensive evaluation by former Deputy Secretary of Defense, David Packard, and the Chairman of the Joint Chiefs of Staff, Admiral Moorer. Together, they analyzed the problem, prepared solutions to it, and drafted a new DOD Directive specifically focused on this problem. This Directive has brought about the following changes:

1. Our internal organization for command and control has been streamlined to assure that the instructions of the National Command Authority, the President and the Secretary of Defense, can be rapidly communicated to the operating forces. In the past, these instructions went from the National Command Authority to the JCS, to the operating commands and then to the operating forces. These procedures have been changed so that critical, time sensitive, instructions go from the National Command Authority to the Chairman of the JCS who, acting for the JCS, has authority to pass instructions directly to the operating forces.

2. The critical component of the Worldwide Military Command and Control System (WWMCCS) is the National Military Command System (NMCS). This is the system through which the National Command Authorities (NCA) receives information and passes instructions. In the past, responsibility for staff supervision and policy guidance for the NMCS was divided among the JCS, the DDR&E and several of the Assistant Secretaries of Defense. No one person was charged with assuring that the NMCS procedures were adequate or that the systems were compatible. I have designated the Chairman of the JCS to operate the NMCS for the Secretary of Defense. The Chairman has the authority and responsibility to see that the NMCS has the capability and procedures to assure the rapid and reliable transmission of the instructions from the NCA to the operating forces.

3. We found that our internal procedures for processing the requirements and providing the capabilities necessary for the WWMCCS were unduly cumbersome. This problem has been met by the creation of a WWMCCS Council. This council is chaired by the Deputy Secretary of Defense, and the members are the Chairman of the JCS, the Assistant Secretary of Defense (Intelligence) and the Assistant Secretary of Defense (Telecommunications). It is the function of this council to provide policy guidance for the development and operation of the WWMCCS and to evaluate its overall performance. The council will be specifically concerned with exercises conducted to test the effectiveness of the WWMCCS, the identification of system weaknesses and the development of R&D and procurement programs necessary to improve the capability of the WWMCCS. This council was formed on 2 December 1971. One of its first actions was a review of the National Emergency Airborne Command Post program's present capabilities, needs and options. The result of its review was my recommendation to the Congress that we take action in FY 1972 to develop and procure an improved capability for this vital link in the command and control of the operational forces. The WWMCCS Council's rapid identification

of this problem and its solution gives me confidence that this vital function is now receiving the senior level and responsible direction it needs.

C. STRUCTURING FOR NET ASSESSMENTS

A recognition of the urgent need for an effective net assessment capability is by no means new or original with me. We have long recognized the requirement, but the creation of the capability to accomplish the extremely difficult and complex task of net assessment cannot be completed overnight.

We approached the task on a phased basis. Last year, I advised you that we had established an organization within the Office of the Director, Defense Research and Engineering (DDR&E) to perform net technical assessments. From a modest beginning, this capability has progressed encouragingly. Techniques have been developed to accomplish the technical assessments, and we are now convinced that some of these techniques can be applied beyond the technical scope.

The intelligence community has performed net threat assessments over the years. They have been of varying quality. In the past, the responsibility for making net threat assessments has not been focused. To improve the quality, objectivity and coverage of the net threat assessments, I have assigned the responsibility for their preparation to the Assistant Secretary of Defense (Intelligence), and this function is being organized in his office.

During the past year, we reached the point where it has become possible to tie together the existing elements of net assessments under central coordination and tasking and to expand the scope of the assessments to include all relevant factors. I, therefore, established the position of the Director of Net Assessments in my immediate office. His job will be to integrate the elements of net assessment by tasking the existing functional assessment capabilities as well as the establishment of capabilities within other functional areas as necessary to give us a total net assessment capability.

To assure that this complex task is accomplished effectively, I have reorganized my immediate staff so that there will be a careful and interdependent use of our new strategy planning tools. Obviously, this small staff will continue to utilize as necessary all of the existing civilian and military resources and expertise in the Department.

We are now at a point where we can, based on our past experience, codify and organize formally the processes which we have been using to an ever-increasing degree in handling such complex matters as Vietnamization, the development of our strategy, the problems of maintaining technological superiority, and zero draft. I have been reluctant to establish new organizations. But these processes work. In my judgment, therefore, formal establishment of these two functions was both needed and necessary.

As I mentioned earlier, the Director of Net Assessments will be supported by the office of my Assistant for Long-Range Planning.

We have made encouraging progress toward meeting our requirements for Net Assessment. The endeavor is still in early stages of development. Although the products to date of our net assessments are most useful in the planning and decision-making process, we must recognize that realization of the full potential for Net Assessment lies well out in the future.

D. IMPROVEMENTS IN WEAPON SYSTEMS ACQUISITION

Weapon Systems Acquisition remains a matter of concern and action in the Department of Defense and one of significant interest to the Congress. It has long suffered from inefficiencies and cost growth. Last year, I reported to you on changes that we have made in the process.

We are now beginning to see some positive results from these policy and procedural changes. The Services have extensively streamlined the management and reporting structure within their systems acquisition functions. Program managers are much more clearly vested with the responsibility and authority necessary to operate effectively and expedite decision making. Our new major program initiations are all characterized by the competitive development, or "fly before buy" concept of management. The Services have also begun a longer range activity of investing in technology for the future through modest prototyping programs. We are just beginning to see the fruits of these labors and expect our future payoffs to be substantial.

Today I would like to outline problems that remain and bring you up to date on our continuing efforts to improve this process.

We all recognize the role that my former Deputy, Dave Packard, played in improving weapons systems acquisition. He brought order out of chaos and provided us with common sense policies for weapon systems acquisition. Just before he left I asked him for his thoughts on what we had learned and what we had accomplished during the past three years. I would like to pass on a few of his thoughts: he identified four factors that seemed to have gotten us in trouble in the past:

-- The initial decision was wrong, resulting in projects that were too ambitious or unrealistic, and often in project cancellations.

-- Department of Defense management was not as effective as it should have been.

-- Cost estimates were unrealistic and accepted even when we could have known better.

-- Defense industry was in trouble in both its management and finances. To a significant degree, their problems were the product of bad Department of Defense procurement policies.

I believe, and he agrees, that we have taken constructive action in each of these four areas and that we can see marked improvement

in all of them. At the same time, there are active programs initiated years ago that still bear the problems that these four factors have generated. Let me list a few examples:

The Mark-48 Torpedo is designed to provide a capability critically needed by the Department of Defense. When we first looked at this program it was in serious trouble both technologically and financially.

It must be recognized that this program was too far along to assume that we will not have problems in the future. We have taken many corrective actions. We did restructure the program. We placed greater emphasis on competitive testing under the most realistic conditions. We then made a procurement decision and selected the contractor we believed had the best proposal and the best comparative capability. At the same time, I want to strongly emphasize that we have not solved all the problems associated with this program. Testing continues and reliability has improved. I hope that the MK 48 will finally meet our needs. I will continue to watch it closely.

The C-5A has come to be the example of all that can go wrong in weapons systems acquisition. It suffered from every one of the four major factors identified by Dave Packard. It is obvious that if we could start over at the beginning of the program, we would do it very much differently -- but those decisions were behind us. We will continue to watch the C-5A closely and do all that we can do to obtain this needed lift capability. At the same time it is clear that the C-5A cannot, and probably never could, meet all the design objectives specified in the original contract.

The F-14 program is another program that warrants and will receive, our closest attention. It, too, has suffered to some degree from each of the four major factors that have created problems in weapon systems acquisition. The testing of the F-14 airframe and avionics has just begun. This testing is critical since the demonstrated effectiveness of the F-14 will be the primary factor that I will consider in making any further decisions on the F-14 program. I am recommending that the Congress authorize $735 million for the F-14 for FY 1973. I urge your support of this request. This authorization will permit us to retain the contractual commitments that we have negotiated with the Grumman Aircraft Corporation and will provide us the financial authority to exercise an option for the procurement of 48 aircraft in Lot V. While the contractor has indicated that he is unwilling to accept this option, we retain the position that we have a valid and legal contract with Grumman. I want to reassure the Congress that the option on Lot V will be exercised only if I am convinced that the F-14 will provide the capability that the Navy needs and at a realistic cost. The Department of Defense has a significant investment in the F-14 in time and in money, but I want to make it very clear that the investment that we will have made is non-recoverable and that my decisions on the F-14 will be based solely upon its demonstrated effectiveness and not upon cost already incurred as a result of earlier decisions.

A final area of major concern is the Navy Shipbuilding Program. I have recommended and strongly support a Shipbuilding and Conversion

program of $3.6 billion for FY 1973. I have described in some detail the objectives of our Strategy of Realistic Deterrence, the threats that we face in reaching these objectives, and our great need for improving and modernizing our naval forces. Despite this urgent need, I cannot and will not accept the serious inefficiencies that we have earlier observed in our shipbuilding program. We need a modern and efficient Navy and we need to procure and operate it in an efficient way. I assure you that I will give equal attention to both of these needs.

I have identified those factors which made things go wrong and some of the continuing programs that were affected by these factors. Let me briefly comment on what I think we have done to minimize the effect of these factors.

1. Decision-Making Factors

First, we have a better basis for improving the initial decision to move forward on a contract. In this Administration we have received clear guidance on the President's objectives in national security affairs. Our efforts to accomplish net assessments will enable us to make better decisions on actual requirements and the initial decisions to meet those requirements. We have also made major changes in the internal decision-making process within the Department of Defense. We give new recognition to the views of the Joint Chiefs of Staff and of all of our personnel in uniform. This increased responsibility given to the Secretaries of the Military Departments has resulted in a marked improvement in their management and recommendations. All of these steps have resulted in recommendations to the Secretary of Defense that are both more relevant and more realistic in their demands in terms of both cost and technology.

As part of the weapon systems acquisition process we have placed increased emphasis on the use of hardware to demonstrate capabilities rather than paperwork to describe them. The prototype program presented to the Congress and now underway within the Military Departments is a specific example of this emphasis on hardware rather than paper. I believe that with hardware in hand, we will be vastly better able to make a good initial decision on production than is possible when that decision must be based solely upon contractor and military department estimates.

Secondly, I believe that we have made significant improvements in Department of Defense management and in our weapons system acquisition policies. In my statement last year I discussed some of these policies and the Deputy Secretary of Defense in his testimony to Congress amplified upon my statement. Very briefly in the acquisition process itself, we are placing increased emphasis on tradeoffs, completing development before production, and better testing before we make a production decision. We have first made a real improvement in the procedure for selecting and training our project managers. The Defense Systems Management School is established and has graduated its first class. The project managers now have increasing responsibility and authority, a more streamlined line of command within their military departments to the decision-makers, longer tour lengths which are tied to major program milestones, and are in a career that is appropriately recognized and rewarded.

The third factor is a basic cause of cost growth that has been most conspicuous in programs in the past. One of the primary reasons for cost growth has been the fact that we have asked for firm bids to produce something that had not been developed. Contractor bids were consistently low and the Department of Defense consistently accepted them without giving adequate consideration to the technical problems, program stretchouts and the cost growth normally associated with that particular type of program. The Department then implicitly put itself in the position of either being willing to see companies suffer major financial losses and possibly go into bankruptcy, or else agreeing to cover the actual costs in one way or another. We have done two things to meet this problem.

First, in looking at programs with very large cost growths, we found that data and techniques were or could have been reasonably available which would have indicated the final actual cost of a system within 10 to 20 percent, compared to the differences between the contractor's bid and the final cost which ranged to more than 200 percent in some cases. We will make more use of these types of estimating techniques in looking at future weapons systems programs so that we can have a better estimate of acquisition costs on which to base our decision.

To this end, I have established an OSD Cost Analysis Improvement Group to review the estimates presented and to develop uniform criteria to be used by all DOD units making parametric cost estimates. This group has representation from the Director, Defense Research and Engineering, and the Assistant Secretaries for Comptroller, Installation and Logistics and Systems Analysis. They will be responsive to the DSARC Chairman in assessing the reasonableness of cost estimates and the criteria followed in their development. At the same time, because valid cost estimates are so critical to a successful defense posture, I expect each Service Secretary to have a staff component capable of preparing independent parametric cost estimates. Our goal is to have formalized procedures for program cost presentations, as well as uniform criteria to which future parametric cost analyses will be expected to conform.

Secondly, we have recognized that development by its nature is dealing with the unknown and wherever appropriate our contracts for development will be on a cost basis rather than of a fixed price type. This will help to minimize the problem of buying in and alleviate many of the problems contractors have faced in the past.

With regard to the fourth factor which has made things go wrong, we have established a better working relationship between industry and the Department of Defense. Industry's weakness in financial structure can inhibit both development capability and productivity, and can contribute to unnecessary costs of weapons acquisition. We must maintain a defense industry that is strong both technologically and financially. Defense profits have been a matter of interest and concern to industry, the Department of Defense, and the Congress. Great attention is normally given to those defense contractors whose profits seem to be excessive. Such industries I have found to be in the minority rather than being representative.

In fact, based on the most recent Renegotiation Board data, pre-tax profits as a percentage of sales have averaged about 2.55%. Based on this data, estimates would indicate that after-tax profits in the Defense industry are less than 1.3% of sales. Based on various studies, including a recent GAO study, it can be safely stated that profits measured either as a percentage of capital (both equity and total capital investment) or of sales, in the Defense industry, are well below profits realized from commercial ventures. It is in the interest of the nation to assure a strong defense industry. I am convinced that only through a strong defense industry can we both obtain the weapons that we need and obtain them at the lowest overall cost to the taxpayer.

We have worked closely with the General Accounting Office this year in taking action to meet legitimate concerns on defense profit levels in two different areas. First, we now permit contractors to collect interest on claims when these claims are honored. It seems a matter of simple equity that in those cases where the government incurs an obligation and the payment is delayed, the contractor should not be expected to finance this obligation during the time it is in dispute. Secondly, we have established a contractual procedure which will recognize the contractor's capital investment in arriving at profits. There has been great interest on the part of the General Accounting Office and the Congress in this recognition of capital. We are proceeding slowly and carefully with this new procedure, so that we can better understand how and when it should be applied.

Two significant changes have also been made with respect to progress payments on contracts. First, a uniform policy has been promulgated on the frequency and timing of progress payments. Second, in the future, progress payments will be made for costs paid by the contractor, rather than for costs incurred as has been the basis in the past. This latter change will provide an increased incentive for the prime contractor to pay material supplies and other sub-contractors more promptly. It will also, of course, somewhat increase the requirement for private financing of operating expenses by the contractors.

All of these improvements together will not accomplish the full level of improvements we seek in improving the weapons systems acquisition process. We need to do more and will continue to search for appropriate new techniques to accomplish our aims. For instance, we are not yet convinced that we have established the proper incentives for the elimination of marginal requirements that needlessly increase acquisition -- and operating -- costs with little performance benefits. We are not convinced we have established sufficient competitive incentives toward economy and simplicity in design and operation. There will probably never be a "final report" on reaching perfection in Weapon Systems Acquisition. However, this Administration intends to continue to provide substantive "progress reports" indicating our efforts in this direction. We are hopeful that the Congress will continue to help us, as they have done in the past, in this difficult task.

REPORT BY FORMER DEPUTY SECRETARY OF DEFENSE PACKARD

Secretary LAIRD. I have summarized on page 236 of my classified statement some of Dave Packard's recommendations in the weapons acquisition area, and I will make available to this committee a copy of Dave Packard's report to me. It is in rather forceful language, and it has not been edited in any way. I think it will be fine for you to have the benefit of the report. I am sure it is in shape for publication. It is strictly a hard-hitting, tough, no-nonsense report. I have summarized it on page 236, and I will make it available to you, Mr. Chairman.

Senator CASE. When it comes up, I wonder if you could let the staff in our offices know, so we would come over and look at it.

(The report follows:)

Improving the Development and Procurement of New Weapons

As we took over the management of the Department of Defense in 1969, one of the most serious problems we faced was the unsatisfactory way the Department of Defense had been managing the development and procurement of new weapons systems. Some criticism of DOD management began to build up over several previous years but seemed to come to a head during the spring of 1969. The F-111 program which had been controversial from the very beginning was still in trouble. Cost over-runs and other troubles with the C-5A project were uncovered; the Mark-48 Torpedo project was in trouble, as was the Main Battle Tank Project of the Army. In fact, it was very difficult to find a new weapons development program without major cost growth or other difficulties of one kind or another.

In addition to the specific programs that were making headlines almost daily with cost growth and other difficulties, a more significant consideration was evident. The overall record of the previous decade in the development and procurement of new weapons systems in fact did indicate very poor performance. Development and procurement budgets had been at an almost all-time high for several years, yet a discouragingly small amount of new equipment had been put into production and made available to the military forces. This was due in part to the considerable resources that had been diverted to supplies and materiel for Southeast Asia. Yet, there was ample evidence to support the

opinion that the American taxpayer had not received very good value for the vast sums of money being spent by the Defense Department.

These problems were magnified by the general anti-Defense attitude which resulted at least in part from our involvement in Vietnam. This attitude in the country made it possible for almost any fact or figure to be used to make a plausible case that the Defense Department was wasting the resources it was given to manage.

There was enough substance to this criticism that the issue could not be simply brushed aside. There was, in fact, only one course of action to take -- that was to move right into the situation and take specific action to assure that the Defense Department would do a better job in the future in managing the development and procurement of new weapons systems.

The efforts to understand what had gone wrong and to decide how to do the job better were undertaken promptly and have continued with a very high priority over these past three years. Numerous discussions were held with OSD and Service people at all levels. Reports were obtained from industry groups and discussions held with representatives of the industry. Many personal visits were held with the contractors involved in major programs and wherever possible we visited the plants where the work was being done and held discussions with the people directly responsible for management of the programs.

As we looked at project after project to try to determine what had gone wrong and find ways for improvement, there seemed four major factors, one or more of which was present in every situation:

A. The initial decision was wrong resulting in project cancellation and projects that were too ambitious or unrealistic.

B. DOD management was not as good as it should have been.

C. Cost estimates were unrealistic and accepted even when we could have known better.

D. Defense industry was in trouble in both its management and finances. To a significant degree, their problems were the product of bad DOD procurement policies.

A. Improving the Initial Decision

One very significant conclusion was reached early in our consideration of this matter. Poor decisions had often been made at the very beginning of the program. Sometimes the project should not have been undertaken in the first place. Sometimes over-optimism at the beginning assured disaster later. The first place to seek improvement, therefore, was to determine how better decisions could be made at the beginning.

1. The Problem.

The most certain way to waste resources is to spend hundreds of millions of dollars on a development and then conclude that we will not need what we are developing. Even when

the right project is selected, there are other aspects in the initial decision-making process which must be right. These relate to the appropriate match between technology and requirements for it is almost certain to be wasteful to try to develop something that is beyond the state of the art, and it is costly to ask for more than is necessary. Careful consideration of this question is necessary before full-scale development is undertaken on a new weapon. If, however, misjudgments are made at the beginning, as is often the case when very advanced technology is involved, this problem can also be managed further down stream in the development program by giving proper attention to trade-offs between requirements and costs even though the initial decision may not be the best. The management of the project must be structured and oriented to make trade-offs possible and this had seldom been done. In fact, the "total package" approach made trade-off decisions between performance and cost and schedule almost impossible and added real and unnecessary cost to programs such as the C-5A.

The nature and the capability of future military forces are of necessity determined to a large degree by the decisions that are made on new weapons developments today. Decisions on individual weapons cannot be made in isolation. In fact, no viable decision on what weapons should be developed can be made without knowing in considerable detail what kind of forces will be needed for the future. The selection of individual development

programs to be pursued must of necessity be made only in the light of careful overall force planning.

The divisionary forces which pressure the decisions on what programs to undertake are numerous and powerful. Within the Pentagon there is a competition between the four Services -- the Army, Navy, Air Force and Marine Corps -- and frequently, between parts of a Service. The competition is not only for the allocation of overall Department funds, but it goes on through the questions of roles and missions and there is a strong tendency for each one of the Services to want to be in on everything. Then there is the pressure from the industry. Private firms try to sell their particular program not only to people in the Services but also to people at the Secretarial level on the E Ring of the Pentagon, and no small part of their effort and energy is devoted to influencing committee members in the Congress. Under pressures of this influence and because of their need to do things to benefit their own districts, members of congressional committees have substantial impact on the decision-making process and the new weapons development programs undertaken. On top of these specific pressures is the basic inertia against change and innovation characteristic of a large organization. One particular characteristic of a military organization is that it tends to think more in terms of getting what was effective in the last war rather than thinking ahead in an imaginative way about what might be needed for the future.

A good example of the divisionary forces that put pressures on weapons systems programs are those forces which emphasize the development of major weapons systems rather than the development of improved capability itself. As a specific example of this, the Navy has placed strong emphasis on the procurement of additional ships and aircraft. At the same time, the capabilities of existing ships and aircraft were limited more by their defensive and penetration capability than it was limited by numbers. The Navy faced and faces a serious threat from surface-to-surface missiles. However, the Navy program in this area has lagged for years at the same time they were making the case for more ships that would be similarly unequipped with the capability or able to defend against it. The real need in the Navy was for increased ECM before an increased number of aircraft. In both of these cases the options presented by the Navy were those which added to force structure rather than very much lower cost options which would have substantially increased their combat effectiveness. There is a similar potential for greatly increased effectiveness at substantially lower cost through the use of "smart" as opposed to "dumb" bombs. The programs that we have established, counter to the original preferences of the military departments, result in improved effectiveness in those areas where we have the greatest deficiencies as opposed to efforts to change force levels per se.

2. Force Planning.

Extensive force planning had, of course, been done in the past within the Department by OSD, JCS, and the military depart-

ments. There had been less than satisfactory agreement among groups involved and in recent years the systems analysis office had tended to dominate force planning and had a strong influence on specific decisions about new weapons programs. There was clearly a need to bring professional military experience more effectively into the picture. We felt this broader base would result in better decisions. This was done by effective use of both the NSC and improved DOD procedures beginning in the spring of 1969.

During these last three years excellent progress has been made through the NSC in providing a foundation for better decisions on the specific weapons needed for the future. A rational decision-making process is extremely important if the right decisions are to be made and if those people making the decisions are to have a basis for over-riding the pressures inherent in the system.

This NSC process began early in the spring of 1969 with a re-evaluation of the United States world-wide commitments and of the requirements for military forces necessary to support these commitments. Very important decisions have resulted from this work. For example, this re-evaluation provided support for the Nixon Doctrine, the substantial change in our policies toward Southeast Asia, a major reassessment of our world-wide commitments, and identification of the forces necessary to support these commitments.

These studies provided the basis for reaffirming the importance of the nuclear strategic offensive TRIAD, land-based missiles, sea-based missiles, and bombers, and reoriented the ABM to the Safeguard program. These studies indicated that our longer term planning should move toward a higher reliance on sea-based strategic nuclear missiles. More recently, these studies, combined with an evaluation of the recent trends in the growth of Soviet strategic nuclear capability, have brought to the forefront the urgency of improving the responsiveness and the survivability of the command and control capability for our strategic forces. The decisions to proceed with the development of the B-1 bomber, to accelerate the ULMS program, and to proceed with the development and deployment of improved command and control capability all are based on those studies rather than from the pressures of advocates of certain systems.

These studies, and their recognition of the changed nuclear strategic balance, have provided the basis for emphasis on conventional (non-nuclear) forces with particular emphasis on developments to improve the capability of our naval forces.

During these last three years we have moved toward more realistic decision-making on new weapons which includes not only a better understanding of the appropriate strategy for the future but which also recognizes the realities of the situation, strategic reality first, of course, but also the diplomatic, political, manpower, and fiscal realities which bear on the decision-making process.

3. Internal Change in Decision-Making Procedures.

During the past administration, high reliance was placed upon what is called systems analysis to make the basic decisions about new programs. We have concluded during these past three years that while systems analysis is useful, good decisions require a combination of professional military judgement and good analysis. The first step was to re-emphasize that military planning should be done by the military services and the JCS and that they should make more use of analytical decision-making procedures. All services and the JCS have developed and applied more system analysis capability to their planning. The OSD Office of Systems Analysis continues to be a devil's advocate in questioning service proposals. There has been much more of an attitude of cooperation, rather than the disdainful criticism that seemed to be the prevailing attitude before. We have a much more effective balance in the Department today between professional experience and judgment and objective systems analysis being applied to this important decision-making process.

We have taken steps to introduce other analytical studies which we believe will help with the decision-making process at the beginning of a development program. DDR&E has developed a procedure we call Area Concept Papers. These papers are studies of a general class of weapons rather than a study of a specific weapon. The papers are designed to give the decision-makers a broad view of what is already being done in a particular area, what deficiencies exist, now and in the future, the potential for further

progress in that area as a background from which to make a decision on a specific new weapons program. These papers also provide the basis for judging whether everything that is potentially productive in an area is being done and assuring the decision-makers that thereis not unnecessary duplication between services on existing projects or when a new project is authorized.

Through the Development Concept Paper we have also put continuing emphasis on the careful and thorough evaluation of a particular project before it is released for full-scale development. These papers provide a concise yet thorough evaluation of the proposed development and enable the decision-makers to be sure the program has been carefully thought through before major funds are released.

4. Prototyping.

We have concluded that analytical studies alone, no matter how well done, are not always adequate. It is often necessary to put more reliance on hardware demonstrations and less reliance on paper analysis in making a decision to commit major resources to a new program. This is, of course, the basic rationale behind the "prototype" approach.

A good example of the prototype approach is the AX program. There is general agreement that we need improved close air support capability. There is a question whether this should be done with fixed-wing, rotary-wing or VSTOL aircraft. In answering this question, there are many issues that cannot be satisfactorily resolved without operational testing of the hard-

ware. We have, therefore, authorized a program which involves the development of two different models of the fixed-wing AX aircraft which will be produced and tested against each other and also against existing aircraft such as the A-7 which are also candidates for this job. Operational testing will also be used to evaluate the Cheyenne and other rotary-wing aircraft and the Harrier. Only after these prototypes have been tested in actual operation will a decision be made to commit major resources to produce equipment for the forces.

We are convinced that a much broader use of the prototype approach will be of immense help in making the right decision before we proceed to the commitment of major DOD resources for a new weapons program.

As a result of these specific and important steps which have been undertaken since 1969, we believe that both the Office of the Secretary and the services are much more capable of making a good decision at the beginning of a new program today than they were three years ago. We recommend very strongly that those actions which have already been undertaken be supported and expanded and applied to the decision-making process at the beginning of every new program. If a decision is made to develop either something that should not be developed or to develop something that cannot be developed, the program has a built-in disaster.

B. Department of Defense Management

From our review of the problems that we found and the programs in trouble, it was clear that a major improvement required changes in DoD management and procurement policies. These changes were required not only at the initial decision stage but at every subsequent stage in the acquisition process. We have given particular emphasis to making the development process more realistic so that we know what we are doing before we do it. We have placed more emphasis on trade-offs during the development process and on the need to look at and test hardware before we make major decisions. In addition to these changes in development, we have made significant progress in improving the general management of the Department.

1. Improving the Development Process.

As an important part of our attack on the weapons development issue, we have kept in mind the basic nature of the development process. The development of any new product, whether it be a weapons system or a commercial product, involves the application of the latest technology to something which needs to be done but which has not yet been done. The development process must work at the frontiers of the unknown. There is always a degree of uncertainty in the development of any new product whether it be a simple device for the commercial market or the most complex weapons system. The parameters involved are the performance characteristics of the device, the cost of this

development, the cost to produce the product and the time required for the development to be completed and the new product put into production. There are uncertainties in each of these parameters -- uncertainty on whether the desired performance can be achieved; uncertainty on what it will cost to achieve the desired performance; and uncertainty on how long it will take.

2. Trade-offs.

One of the problems we found with many new development programs was that the performance desired was rigidly specified, the time to complete the development and put the proposed new product into production was rigidly specified, and the cost was rigidly specified, often through a so-called total package procurement procedure. After careful consideration, we concluded that a satisfactory balance between performance, cost, and time to operational capability is possible only if the people who manage major new weapons development programs are willing and able to make trade-offs. This also requires the utilization of the appropriate form of contract for the development.

3. Complete Development Before Production.

Almost without exception the programs in trouble had been structured so that production had been started before development was complete. This was often, if not almost always, preordained at the outset of the program. It was next to impossible to open up an on-going program so that the development could in fact be completed before a production was started. Very often one of the pressures which kept this concurrency between develop-

ment and production built into a particular program was the insistence by the military department that it must have this new product operational in the forces by a specific date. Having made the case for this date in the beginning, the military department was very reluctant to admit later that a delay could be accepted. On most on-going programs there was a considerable investment in production effort when trouble began to show up. It was generally too costly to stop all the production work while the remaining development problems were worked out. Costly rework and back-fitting seemed to be the only solution when trouble showed up on on-going programs. The only satisfactory answer is to start the programs out right in the beginning.

Of all the major programs which we examined, there was hardly even one which kept to the original schedule. In every case if more time had been taken to complete the development before production was started, the new weapon would in fact have been available to the forces just as soon but with fewer problems and at a lower cost.

Beginning in 1969, we began to apply in a limited way, this important concept of separating the development from production on programs already in progress. We found it difficult to change an on-going program so the new F-15 and B-1 programs were the first major programs to which these principles were applied in what we considered the proper way. The S-3A program, although underway, was modified by a six-month stretch to reduce the concurrency between development and production. There was

great reluctance on the part of the Navy to do even this much. It was only done by our insistence and it has turned out that the six months stretch was the minimum necessary to avoid serious problems with this program. A 12-month stretch would, in fact, have been better. The F-14 contract, which had been announced a few days before we took office, was reviewed but no major changes made. It is now clear that had we applied to this project the basic principle that development must be completed before the start of production, the problems which are beginning to show up in the F-14 program would have been minimized or eliminated. It is too late to restructure the entire F-14 program but further modifications will probably be necessary.

4. Better Testing

One very important question in this fly before you buy approach is how to determine whether development is complete and the proposed new weapon is indeed satisfactory before it is put into production. This involves a question of what kind of testing should be done and who should do that testing. We have given considerable attention to this problem and have taken steps which will provide for more testing, including operational testing. In addition, the testing will be done with more independence from the people who are responsible for the development of the weapon. A new section in DDR&E has been established with the responsibility to examine each new program to make sure that adequate plans for testing are included as part of the program. We have asked each Service Secretary to arrange it so that the organization

responsible for doing the testing reports to him through a channel independent from the channel used by the people responsible for doing the development.

At the OSD level, even though the group responsible for over-seeing these testing procedures is part of DDR&E, arrangements have been made so that the head of the testing group reports independently to the DSARC and the Secretary. We believe these steps will provide reasonable assurance that the testing of each new product under development is both adequate and objective in the future.

5. Improving the General Management.

While the things I have described thus far have been directed at problems which have been troublesome, even on programs which are otherwise well managed, we concluded that there was room to improve the general management of almost all new weapons development programs. One of the simplest yet most fundamental ways to improve management is to put a better man in charge. Time and again in our consideration of this matter during the past three years, we found the expected high correlation between good managers and good management and between poor managers and poor management. We have, therefore, given considerable attention to the question of how better people can be assigned to these programs. In order to assure that there will be more good managers in the future we have also taken steps for better training and better motivation. Once a good man is selected he must be given authority commensurate with his responsibility

and left on the job long enough to be effective. Motivation must provide rewards for good performance and penalties for those who perform poorly. All of the military departments have taken important steps to select, train, and motivate more good people for project management and to keep them on the job. We have established a new school at Fort Belvoir for the training of project managers which with continued attention and support can become an outstanding academy of good management. There are many more good people assigned to major new weapons development programs today than there were in 1969. Equally important, these people have been given more responsibility, more authority, and more support from the top levels of each of the three military departments than was the case in 1969. The channels of communication to and from important project managers in all three military departments with both the Chiefs and Secretaries and with top officials in the OSD offices has been greatly improved. There is already increasing recognition that project management is an important profession, not just another two year tour of duty.

6. Organization Structure.

Good management is difficult to achieve even with good people unless they can work in an appropriate organizational structure and in a motivating and rewarding environment. While some improvements have been made in the reporting relationship and the organizational structure for some specific project managers, there are changes and improvements

yet to be made in the organizational structure of the military departments. This fact has been recognized at a high enough level in each Department so that some action toward change is underway, but much yet needs to be done.

7. Excess Paper Work.

Over the past decade there has been a great proliferation of paper work generated in the course of a major weapons system development. We have concluded that a great deal of this paper work is not only unnecessary but is counter-productive to the efficient management of these important programs. Some of the paper work is in the form of instructions written in the greatest detail on the way the job is to be done. Many of these instructions do little more than divert useful time and attention to unproductive work and often these detailed instructions reduce the likelihood that any intelligence or judgment will be applied to the job.

Much of the paper work is in the nature of reports made to inform people at a higher echelon about the status or the progress of the project. Often these progress reports are reviewed and modified in echelon after echelon as they move upward in the system, and they tend to tell people what someone thinks they will be pleased to hear about the project rather than what in fact is actually going on. Many of these reports are not only wasteful of time and effort but in some aspects are counter-productive to good management of the program. In numerous cases it has been possible to learn more about a program from a few minutes discussion with the

project manager than from a formal briefing which probably required hundreds of man hours to prepare and review. Very substantial reductions in the amount of paper work have been made at all levels and efforts to keep paper work to the minimum level required should be continued on an urgent basis.

8. Clarifying Responsibilities.

As problems began to show up on many programs in years just prior to 1969, they were in fact receiving considerable attention from various OSD offices. In some cases these offices were getting into the projects in too much detail and making decisions the project people in the military departments were supposed to be making. Even though the various OSD offices had considerable competence, the things they got into were not always in their area of competence. This procedure resulted either in great effort within the military department to justify its position or an abdication of the responsibility because the people in the military department felt they would be over-ridden anyway by people in OSD.

As we looked at this entire problem, it became apparent that the only way a better job could be done was for the military departments to improve their management of the programs, not for the OSD offices to try to manage the programs for the military departments.

To straighten out this situation, several specific steps have been taken. First, we clarified the responsibilities of the various OSD offices with respect to the development and procure-

ment process. Second, we continually restrained OSD people from getting involved in a project except (1) at certain designated milestone check points; or (2) when clear evidence of trouble became apparent. The Defense Systems Acquisition Review Council was established to monitor programs to make sure the improved procedures were in fact being applied to each major project at all stages and to assure that programs were ready to move into production or the next stage of development. The military departments were encouraged to accept the responsibility on the basis that they would not be bothered by OSD staff interference as long as the project was being managed well. This approach has greatly improved the attitude of the military departments and their performance as well. Close attention will be necessary on a continuing basis to hold the considerable improvement that this clarification of responsibilities has brought about.

C. Cost Growth

Historically, cost growth has been normal for virtually all DoD weapons procurement programs. There are several reasons for this. One reason has been the inflation in prices and cost in the entire economy and an inflation at somewhat high rates in certain portions of the defense industry. However, the major reason for cost growth for major weapons systems procurement has been the way the Defense Department and the contractors have done business.

The normal characteristic of the weapons systems acquisition process is that the industry is asked to do something that has

not been done before. For just this reason it is clear that neither the Department nor industry can reasonably expect to know what a new weapon system will cost before it is developed. The contractors have bid on these proposals, frequently recognizing that the failure to win a given contract could affect the continued existence of a portion or perhaps their entire company. This has resulted in unrealistically low bids. Prior to the time we came into office, contractors were seldom required to perform at the original bid price. They were able to increase their prices by mutual agreement or by changes which called for re-pricing. The magnitude of the under-bidding on some of the major contracts could have been and often was predicted at the time the contract was signed. As an example, parametric cost estimates, which can predict costs within 10% or so, predicted that both the F-111 and the C-5A contract bids were much below what the costs were likely to be. These analytical estimates, using parametric techniques, predicted the actual cost of both of these programs within about 10% of what it turned out to be. Even though the DoD knew or could reasonably have known that the bids were unrealistically low, the Department accepted the contractor's bid and made no effort to determine whether or how the contractor would be able to cover estimated and probable costs that were clearly going to be in excess of bids. As a result of this, we implicitly agreed to either see companies go into bankruptcy or else that we would cover the increased cost through one device or another in the future.

The problem of cost growth has not gone away. Inflation and low bidding are still with us. However, the changes we have made in contracting procedures, together with an increased use of parametric costing, will assist in reducing the magnitude and the frequency of this problem.

D. Defense Industry

When we came into office, the Defense industry was already beginning to get into trouble and the situation got progressively worse. By 1969 the industry was coming to the end of a period when there had been heavy procurement of weapons and equipment in support of Southeast Asia. The industry was still making optimistic estimates of future business levels and assumed continued high defense budgets. During the past three years the industry problems have become severe with a substantial reduction in workload and employment, and a substantial increase in overhead costs for the programs that remain. In looking to the future, we see little chance of a substantial increase in business for the Defense industry; rather, it appears that we have reached a plateau and policies and operations must accommodate to it.

One of the major improvements that we have introduced in our relationships with Defense industry has been a change in the type of contracts reached with industry. Our basic approach has been to recommend that the contract type be selected to accommodate to the degree of risk and the number of unknowns.

This will result in more cost-type contracts for the development stage and firm fixed-price contracts for production

after development is finished. This approach is in marked contrast to the contract types that we found on arrival. Certainly the most extreme example of the earlier contract type is total package procurement. The defects in this contractual approach have been evident from sad experience. It is clear that we should not contract for unknown technology at a firm fixed price. These conclusions can be drawn from the F-14 contract which has concurrency between development and production under a fixed-price contract with a ceiling which the contractor cannot meet and he probably knew he could not stay within the bid when he took the contract.

We have given attention to the subject of industry profits, both the level and manner in which they are determined. Initially, we were concerned about the high level of progress payments outstanding in the Department of Defense. It was clear that these progress payments took DoD funds early in the production cycle -- at the same time the industry which required the progress payments obviously lacked the capital to support their own production. These industries were unable to increase the amount of capital in their company, because their profit levels were lower than other less risky business investments. If we are to reduce the level of government financing, both progress payments and equipment provided to the defense industry, it will be necessary to afford this industry competitive profit levels which recognize the unusual risks characteristic of DoD business.

We have approached the profit problem in two ways: First, in public comments we have attempted to demonstrate that defense industry profits, contrary to the general public impressions, are in fact, low. This judgment has been supported not only by our internal studies but also by the GAO. The second thing that we have done is to take measures to increase profits and to recognize capital investment in determining profit levels. One of the steps in increasing profits has been a policy change which permits contractors to receive interest on claims when they are settled in favor of the contractor. The second major change just being introduced is a procedure which will permit us to recognize the contractor's capital investment.

The defense industry is a vital component of national security. The worst of this industry's transition problems are behind it. It now faces a relatively even but lower level of business for the foreseeable future. We can anticipate that additional defense companies will have financial trouble but many can regain their health at lower business levels or else diversify into fields outside of defense. It is important that future procurement policies assure reasonable profits for the defense industry. Only with adequate capital strength, which can come only from profits, can we have a strong defense industry able to supply the best weapons for our forces at the lowest cost to the government.

Are Weapons Becoming Too Expensive?

Underlying the criticism of cost growth and what can be done about it is the general feeling that the new weapons for the

Defense Department are becoming too expensive. Is there a better way to obtain what we need for national security at a lower cost. The actions we have undertaken during these past three years can improve the efficiency of the development-procurement process for our weapons for the future and these new policies will be helpful. By far the most important factor driving the cost up is the capability we ask for in new weapons.

Let's look at the case of new fighter aircraft. The cost of a fighter is very closely related to its weight. A 40,000 pound airplane will cost about twice as much as a 20,000 pound airplane. If we are willing to settle for fighters at 20,000 pounds instead of 40,000 pounds, we could have twice as many for the same cost or about the same number for half the cost. Which way to go must be determined by what we propose to do with these fighters. A 20,000-pound plane operating 400 miles from home base is a poor match for a 20,000-pound plane operating over home base. If we want to operate 400 miles from home against 20,000 pound aircraft, we can do much better with 40,000-pound fighters. The question, then, is not whether we should have X number of 40,000-pound fighters or 2X number of 20,000-pound fighters. If we want to have the capability of fighting forward of home base, we need larger and more expensive aircraft. This is, of course, a generalized example, but this is the problem of too expensive weapons.

If we want attack submarines that operate only close to the shores of North America, they can be smaller and less

expensive than submarines that can operate anywhere in the oceans of the world. If we want to have aircraft carriers that can roam the Oceans for extended periods without refueling to project American power by being able to fight if necessary, we better build large nuclear-powered carriers which will be very expensive. If we want aircraft carriers only to convoy ships across the Atlantic, they can be smaller and less expensive.

What our future forces will cost is determined by what we want those forces to do. Once we decide on the capability we want, it is wrong to try to cut corners. If we are going to do a job, let's do it right. It won't cost much more to do it right than to have not quite enough. In national security, not quite enough is something the United States cannot afford.

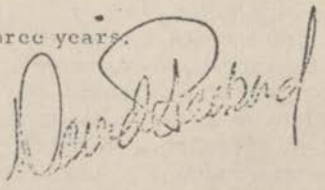
Whether the cost of new weapons for our future forces can be kept within our available resources will be determined by the military capability we need for the future security of our country and to support our foreign policy. Better management will at best buy us 10-20% more for our money and, of course, better management should be pursued with great vigor. The important question is can we support the foreign policy we are pursuing with the military capability we are buying? Here there are only two ways to go -- buy what we need and don't cut corners or reduce what we need by reducing our worldwide commitments.

During these past three years we have reduced our worldwide deployments and this has allowed us to make some reduction in defense expenditures. We have taken steps which will buy

more military capability for our money but not enough to support present commitments at lower budget levels. Our present policies have a much larger element of realism than the policies we found in the Department in 1969. These new policies should be supported with vigor.

Participatory Management

In addition to the many specific steps which have been described, we have also achieved the one thing which is most important. The people in the OSD and in the Military Departments are working together in a much more cooperative, effective way today than they were in 1969. This has been the result of some of the specific steps, clarifying responsibilities, etc., but it is also a matter of attitude. Participatory management has in fact made people feel they are part of the team. Human Goals has emphasized that good management is recognizing the abilities and the aspirations of people. If this spirit, this attitude, can be preserved and strengthened and made a permanent characteristic of the Department of Defense, we can have the satisfaction that there has indeed been real and substantial progress during these past three years.



FOUNDATION OF A STRATEGY FOR PEACE

Secretary LAIRD. I do not suggest that the changes in the approach and implementation to planning outlined in this Defense report represent perfection or that they are a total solution. Constructive discussions and constructive criticism must continue. We face a whole range of incredibly complex problems.

The responsibility of meeting these problems is one the Congress shares with us. We intend to increase further our consultation and cooperation with the committees to whom we are responsible.

Of equal importance—since national defense, in the last analysis, is the responsibility of all the American people—is the need for a public dialog such as we have not had since the days of the Marshall plan.

To the maximum extent possible, I plan to visit with citizens throughout our country, to share with them my thoughts and to hear directly from them their views on the major elements of our strategy.

I would be pleased, for example, to consider favorably an invitation to appear before the platform committees of both of the two major parties, where responsible citizens from all over America will be deliberating on the nonpartisan issue of national security.

Let me conclude by observing there may be some who will say that the increased request in the fiscal year 1973 budget for naval funding is a precursor to a blue-water strategy. This is not the case.

In a world where we are striving to prevent war—and the danger of war—the new modern Army, including a revitalized and strengthened National Guard and Reserve, has never had a more important or more challenging role than now.

The Air Force, with its unique mobility and flexibility, will be second to no other service, since its capabilities encompass and support the whole spectrum of required U.S. deterrent forces.

And, of course, the Navy—with its combination of air, sea, and land forces, represented by the U.S. Marine Corps—has an equally key role to play in our national security strategy of realistic deterrence.

NEW ORDER OF SERVICE PARTNERSHIP

Our new strategy provides an unprecedented opportunity for a new order of service partnership—a partnership that will be as effective in a peacetime Nixon Doctrine deterrent role as it has so often been in war.

This is not a blue-water strategy.

This is not an aerospace strategy.

This is not a ground combat strategy.

It is a strategy that will require the courage to look anew at parochial and outdated roles and missions assignments.

It is a strategy of realistic deterrence.

It is the essential foundation of a strategy for peace.

Mr. Chairman, that completes my summary of the report. The whole unclassified version is going to be placed in the record. I thought perhaps I could move to certain other sections of the report that would be of particular importance to the committee.

One of those concerns the undersea long-range missile system, starting on page 116.

Chairman ELLENDER. Off the record.

(Discussion off the record.)

Chairman ELLENDER. You may proceed.

UNDERSEA LONG-RANGE MISSILE SYSTEMS

Secretary LAIRD. I want to highlight some of the major programs. One of these is the undersea long-range missile systems.

The continuing Soviet strategic offensive force buildup, with its long term implications, convinced us that we need to undertake a major new strategic initiative. This step must signal to the Soviets and our allies that we have the will and the resources to maintain sufficient strategic forces in the face of a growing Soviet threat.

U.S. CAPABILITY TO PENETRATE RUSSIAN ABM SYSTEM

Chairman ELLENDER. Mr. Secretary, do you think that with our present capability we can penetrate the ABM system of the Russians?

Secretary LAIRD. I do. I do at this time, Mr. Chairman. I think that we now have a realistic and sufficient strategic deterrent. My concern is for the out years, not the year 1972, as far as our strategic deterrent is concerned.

Chairman ELLENDER. How far would you extend that?

Secretary LAIRD. It depends on how far they go with their offensive systems.

Chairman ELLENDER. Of course, I presume that their tendency would be the same as ours. If we continue to increase ours and continue to improve it, they will do the same thing, so that there will be that tug of war that I mentioned this morning.

Secretary LAIRD. They are not only increasing their numbers, they are improving their system. The only thing we have done is improve our system. We have not increased our number of launchers.

U.S. ULMS AND COMPARABLE RUSSIAN DEVELOPMENT

Chairman ELLENDER. Do they have anything like ULMS in the offing?

Secretary LAIRD. The Soviets?

Chairman ELLENDER. Yes.

Secretary LAIRD. Yes.

Chairman ELLENDER. When did they start that?

Secretary LAIRD. I have no question in my mind that the Soviets will go for a longer range missile system which they could possibly deploy in a modified version of their Y class submarine or a new submarine. They have already tested a longer range submarine launched missile.

Chairman ELLENDER. On what is that conclusion based?

Secretary LAIRD. On the test.

Chairman ELLENDER. Does it entail a larger submarine or modification of existing submarines?

Secretary LAIRD. I think they could modify their present Y class submarine.

Chairman ELLENDER. You mean they would do what we did. In other words, if they improve their missiles, they may take the submarines they now have and employ a missile with greater power.

RUSSIAN MODERN FACILITIES AND CONSTRUCTION PROGRAM

Secretary LAIRD. They could retrofit the new missile into the Y class. They are going forward with a tremendous construction program.

[Deleted.] He will also outline to you what we think will be their follow-on programs, in the briefing which he will give you assessing their capability as compared to our capability.

[Deleted.] He will also brief you on the tests that they have gone forward with, the longer range undersea missile—I think that this will be very important evidence which this committee will want to consider.

RUSSIAN MISSILE RANGE

Senator CASE. What is the range of the missiles that they are testing now? It was referred to the other day.

Secretary LAIRD. [Deleted.] Miles.

Senator CASE. As compared to our 2,500.

Secretary LAIRD. Yes.

RUSSIAN LAND-BASED MISSILES

Chairman ELLENDER. Do you believe that they are going to take the same course that you say we are going to take, which is not to build more land-based missiles but to go the ULMS route?

ADDRESS BY SECRETARY LAIRD AT ANNUAL LUNCHEON OF ASSOCIATED PRESS

Secretary LAIRD. Well, they have gone both routes. Since I have been Secretary of Defense—and I don't claim credit for this—but they have increased their missile, land-based missile force by approximately 500 land-based missiles, and we have not increased ours at all. They have not only increased their numbers, but they are going forward with improvements as well. We have only improved our systems. I think it would be well to put in the record a copy of a speech I gave 2 years ago on this subject. Although some of the figures are outdated, the general trend is clear. Admiral Moorer's statement, which he will brief to you, will update those figures.

(The address follows:)

I was particularly pleased when your President, Paul Miller of Gannett Newspapers, called me on a Saturday morning several months ago to invite me to speak to the Annual Luncheon of the Associated Press on the subject of the strategic balance. I told him that I regarded this forum as particularly appropriate to express my views on the need to make available to the American people additional information regarding national security.

When I assumed office 15 months ago, I immediately established as a top priority goal the restoration of credibility in the Department of Defense. Since then we have attempted to follow President Nixon's stated desire to make more information available to the American people.

The editors of the Associated Press and all members of the communications media in this country have a deep interest in this subject. I pledge to you that we shall continue to devote maximum attention to reducing and hopefully eliminating overclassification in the Department of Defense. And, we will provide all the information we can within the limits of national security, consistent with the safety and legal rights of our citizens.

This open news policy has brought about significant progress in at least five major areas where information was previously withheld from the American people.

1. Previous policy was to restrict public discussion of Prisoner of War matters. Present policy is to foster public discussion and to focus worldwide attention on the plight of our prisoners of war in order to gain humane treatment for them and to obtain their release.

2. Previous policy was to withhold from the public information on chemical warfare and biological research matters. Present

policy is to keep the public informed about our new policies in these two areas, the reasons for these new policies, and the steps being taken to implement them.

3. Previous practices on reporting the costs of major weapons systems led to a major credibility problem in the Department of Defense. Our new policy of full disclosure on major weapons costs will help to restore the Department's credibility and will assist us in gaining better control of costs and in developing better management practices.

4. For several years, the American people were denied knowledge about our activities in Laos. Today, the American people are being informed about what we are doing and what we are not doing in Laos.

5. In the past, overuse of classification denied to the American people pertinent information on the nature and scope of the strategic nuclear threat. In my view, there is still too much classification, but we have tried and will continue to make more and more information available on this subject which is so crucial for the future security of our country.

In my remarks today I will attempt to shed more light on the crucial subject of the strategic threat. In particular, I want to discuss with you editors the nature and scope of the growing Soviet threat, recognizing full well that, in Vienna, our negotiators have just begun round two of the Strategic Arms Limitation Talks, commonly called SALT.

I hope for success at SALT. I want to emphasize that point. I also want to emphasize that our top military leadership hopes for success at SALT. Where the security of the United States is involved, it is this objective -- insuring national security -- which is most

important. A lower-cost means to achieve that objective, lower compared to what otherwise may be required, -- if it can be achieved within tolerable risks -- is obviously most desirable to all Americans, civilian and military.

The budget we have recommended to Congress for the next fiscal year demonstrates how deeply the Nixon Administration is committed to progress at SALT. We have called this year's defense budget a transitional budget. It is transitional because in terms of military capability, it is basically a status quo, stand-pat budget. We have postponed basic national security decisions in the strategic field in order to give maximum opportunity for SALT to be successful, and to foster a meaningful beginning for the era of negotiation President Nixon and the American people seek.

The objective of the Nixon Administration is to restore and maintain peace. With regard to SALT, the President's actions and words document this Administration's accent on negotiation rather than confrontation.

In my Defense Report to Congress in February, I expressed concern that the United States, by the mid-1970's, could find itself in a second-rate strategic position with regard to the future security of the Free World.

Today, in keeping with our policy of maximum information, I intend to present additional reasons for this concern.

It is important to discuss the growing strategic threat because it is essential for the American people to understand the complex issues involved, if we are to insure our national security interests through the decade of the 1970's. The American people need to understand the reasons President Nixon

is pursuing the course he has recommended in this year's transitional budget.

As Secretary of Defense, I must face the fact that we are taking a risk by postponing hard decisions which the increasing Soviet threat poses for us. I recognize that in the interests of lasting peace, some risks must be taken. But, it is my judgment that as the American people are provided additional information, such as we are discussing here today, they will agree that we are literally at the edge of prudent risk. And the inescapable conclusion will be that if the Soviet strategic offensive buildup continues, the risk to our nation will become too great to sustain without major offsetting actions.

Therefore, what I particularly want to focus on today is the basic asymmetry between what the United States has been doing and what the Soviet Union has been doing in the field of strategic nuclear weapons in recent years.

In a word, for the past five years, the United States has virtually been in neutral gear in the deployment of strategic offensive forces, while the Soviet Union has moved into high gear in both deployment and development of strategic nuclear weapons. In the 1965-67 time period, the United States decided on a level of strategic nuclear forces, including Multiple Independently Targeted Reentry Vehicles (MIRVs), which was deemed adequate to preserve our deterrent posture for the threat of the 1970's which was projected then. No basic

change has been made in the force level decisions established in the mid-1960's.

The Soviet Union, by contrast, has engaged in a major effort since 1965 to change the balance of power. The United States then, unlike the situation today, clearly occupied a superior position.

Except for the minimum "hedge" that SAFEGUARD will provide, we have not responded to the Soviet strategic offensive buildup with new deployment programs. We did not respond in past years because the United States deliberately chose to assume that the Soviet buildup at most was aimed at achieving a deterrent posture comparable to that of the United States. We have not responded this year because, as I have said, we fervently hope that SALT can render such a response unnecessary.

As much as we might wish it otherwise, however, we must concentrate our attention on what the Soviet Union is actually doing. In the current situation of a diminishing U.S. deterrent and Soviet momentum, we simply cannot base our plans and programs on what we hope the Soviet Union may do either unilaterally or in SALT. The Soviets have a momentum going both in strategic weapons deployments and in strategic weapons developments. If their strategic posture could be expected to stay at the operationally deployed posture which exists today, I believe we would have a tolerable situation. What must concern us, however, is the momentum the Soviets have established both in deployments and developments and where that momentum may carry them.

Let me explain in more detail the basic problem.

The most crucial aspect of national security is the strategic balance between nations that have competing interests in the world. The strategic balance has a direct effect on relations between the superpowers. It has an indirect effect on other nations both in terms of their own relations with each other and in terms of their relations with the superpowers. As one example, a situation of clear superiority on the part of the Soviet Union would have profound implications for any future political or military confrontation between NATO and the Warsaw Pact. In fact, a clear strategic superiority on the part of the Soviet Union would affect our interests and our obligations throughout the world.

In our continuing debate on defense matters, it has been said many times that the driving force behind the so-called strategic arms race is the "action-reaction" phenomenon. The recent ABM-MIRV discussions in this country illustrate this. The argument is made, for instance, that the deployment of defensive missiles by one side tends to generate increased offensive deployments by the other side.

I certainly agree that one side's actions definitely can influence what the other side does. But just as weapons in themselves are not the cause of wars, neither are a country's actions in weapons deployment -- in themselves -- the driving force in a so-called arms race. The fundamental driving force in an arms race is what one country perceives as possible objectives of another country's actions.

Let me explain it this way. Our goal is a stable peace. Our strategic policy to achieve that goal is deterrence. As publicly stated,

the basic rationale for United States weapons deployment in the strategic field has been and remains deterrence. Our actions of the past several years underscore the fact that deterrence is our fundamental policy and that we seek no more than a posture of effective deterrence.

Because we in the United States seek a posture of deterrence to protect our interests and those of our allies, we obviously could recognize as legitimate a Soviet desire for a comparable deterrent to protect its interests.

I know that the actions of the Soviet Union in recent years have raised questions in the minds of some of you editors and others about the true objectives they are pursuing.

As I have said many times, I do not believe that it is appropriate for me, as Secretary of Defense, to attempt to assess the strategic intentions of another country. However, under my responsibilities, I must be concerned about present and potential strategic capabilities.

You representatives of a free press understand fully the national security price an open society must pay when competing with adversaries who cloak their plans in secrecy and attempt to hide both their objectives and their hardware behind the mantle of a closed society. The whole world knows what we in the United States have and what we plan in the national security field. Meaningful essentials are laid bare in an open forum -- in official statements, in Congressional hearings, in the give and take of Congressional and

public debate and in the reports of a free and competitive press. I would not have it any other way.

Let me emphasize again my conviction that the American people have a right to know even more than has been available in the past about matters which affect their safety and security. There has been too much classification in this country. In particular, too much has been withheld in the past about what has been going on in the closed societies of the Soviet Union and Communist China.

As we all pray for success in Vienna, let me point out that, in my view, the American people will support an arms limitation agreement only if they are confident they have the relevant facts about the strategic balance.

The facts I am about to present are not taken from external Soviet discussions of their strategic forces. They do not come from press conferences in Moscow, from testimony in the Kremlin, from news stories in Pravda, or from published annual Defense Reports by Marshal Grechko.

Rather, the information I am presenting to you is based on our own observations of what the Soviets are doing -- and on our belief that this information and these facts should not be withheld from the American people and should be made available to others in the world.

Let us examine what has happened in the past five years to shift the relationship between U.S. and Soviet strategic forces and to provide an accelerated momentum to the Soviets in the strategic field:

In 1965, the Soviet Union had about 220 launchers for the relatively old-fashioned missiles -- SS-6's, SS-7's and SS-8's -- somewhat similar to our TITAN. We had 54 TITANs in the inventory at that time.

Today, these two forces remain essentially the same. So in this category of old-fashioned multi-megaton weapons the Soviets had and still maintain a better than 4-1 advantage.

In 1965, the Soviet Union had no relatively small ICBM launchers comparable to our MINUTEMAN. By 1965, we had 880 MINUTEMAN missiles operational and had established that the total force level for MINUTEMAN would be 1,000 launchers. In the 1965-67 time period, the United States finalized plans to convert a portion of the established MINUTEMAN force to a MIRV MINUTEMAN III configuration.

Today, the Soviet Union has over 800 such launchers operational, and a projected force that could exceed 1,000 launchers within the next two years. These launchers include both the SS-11 and SS-13 missiles. Concurrently, flight testing of an improved SS-11 missile continues. Thus, at present construction rates, the Soviets will achieve parity in MINUTEMAN-type launchers within the next two years or so and could move into a substantial lead in this category by the mid-1970's if they continue to deploy these missiles. The previously scheduled U.S. program to MIRV a substantial part of MINUTEMAN continues in progress.

In 1965, there were no operational launchers for the large Soviet SS-9 missile which, in its single warhead version, can carry up to 25 megatons.

Today, I can report to you that there are some 220 SS-9's operational with at least 60 more under construction. Testing of an SS-9 multiple reentry vehicle -- the triplet version -- continues. The U.S. has no counterpart to this program involving large missiles. So, in this area, the Soviets have and will maintain a monopoly.

In 1965, neither a depressed trajectory ICBM nor a Fractional Orbital Bombardment System existed in either the Soviet or U.S. inventory.

Today, the Soviets have tested both configurations and could have an operational version already deployed. The United States has developed nothing comparable to these systems.

In 1965, the Soviet Union had about 25 launchers for Submarine Launched Ballistic Missiles (SLBMs) on nuclear submarines, and about 80 more on diesel submarines. Most were designed for surface launch only. The U.S. had 464 SLBM launchers operational on 29 submarines in 1965 and Congress had authorized the last of the 41 nuclear-powered submarines in our POLARIS Force in the previous fiscal year.

Today, the Soviets have over 200 operational launchers on nuclear submarines for submerged launch SLBMs and about 70 operational launchers on diesel submarines. In the next two years, the Soviets are expected to have some 400-500 operational launchers on POLARIS-type submarines, and at present construction rates -- 6-8 submarines a year -- could match or exceed the number in the U.S. force by 1974-75. United States POLARIS submarines still number 41 and no increase is projected in current plans. Conversion of 31 of our POLARIS submarines to the MIRVed POSEIDON missile is planned, and eight conversions have already been authorized by Congress.

In 1965, there was no development underway of a so-called Undersea Long-Range Missile System (ULMS) in the United States and there appeared to be none in the Soviet Union.

Today, the United States is spending relatively small sums in the research and development area on preliminary investigations of such a system. I can also report to you today that the Soviet Union, on the other hand, already is testing a new, long-range missile for possible Naval use.

In 1965, the Soviet heavy bomber force consisted of slightly over 200 aircraft, about 50 of which were configured as tankers. The U.S. heavy bomber force strength was about 780 in 1965.

Today, the Soviet heavy bomber force is slightly under 200, with about 50 still configured as tankers. U.S. heavy bomber strength has declined to about 550 today.

In 1965, we estimated that the Soviet Union had a complex of ABM launchers being constructed around Moscow as well as a number of radars under construction which could provide early warning acquisition and tracking functions for ABM use.

Today, we believe that 64 Moscow ABM launchers are operational together with sophisticated early warning radars and tracking capabilities. ABM testing for new and/or improved systems continues. Today, the first two SAFEGUARD sites have been authorized, but will not be operational before 1974-75. This modified deployment schedule is considerably behind the schedule Congress had approved in 1967 for the planned SENTINEL area defense, which called for initial capability in 1972, and nation-wide coverage in 1975.

Thus, in the space of five years -- from 1965 to 1970 -- the Soviet Union has more than tripled its inventory of strategic offensive nuclear weapon launchers from about 500 to about 1700 -- which includes some 200 heavy bombers in both totals -- and continues the momentum of a vigorous construction program. In that same period, the Soviet Union has virtually quadrupled the total megatonnage in its strategic offensive force. The United States, on the other hand, in the same time period, made no increase in its established level of 1710 strategic nuclear missile launchers and reduced its heavy bomber strength of 780 by over 200. In that same period the United States also reduced its megatonnage by more than 40%.

To repeat: The United States has taken no action to increase the total of approved strategic offensive delivery vehicles in the past five years in response to the rapid growth in Soviet strategic delivery vehicles. We have, of course, maintained certain options and other steps have been taken to preserve our deterrent in the face of this increase.

Two programs that have been the subject of intense public discussion are, of course, our MIRV and SAFEGUARD systems.

Let me emphasize that MIRV is needed to preserve our deterrent. Many people do not fully understand why it is necessary for us to continue the previously planned, Congressionally-approved and funded deployment of MIRV systems. The point is made that the current number of strategic nuclear weapons on alert in our force is sufficient for immediate retaliatory use in a crisis. Because MIRVing would more than double the number of deliverable weapons, the conclusion is drawn that this is unnecessary.

This conclusion could be valid, if we assumed that the POLARIS, MINUTEMAN, and Bomber forces all would survive a surprise attack and that the Soviet Union would not deploy an extensive ABM system. However, as was pointed out in my Defense Report in February, the rapidly-growing Soviet strategic offensive forces could seriously threaten both the U.S. MINUTEMAN and strategic bomber forces by the mid-1970's.

Assuming we do not take additional actions to offset the expanding threat -- and this apparently is what some people urge -- I must, as Secretary of Defense, face the disquieting possibility that in the mid-to-late 1970's we would no longer be able to rely on either the Bomber or MINUTEMAN force to survive a surprise attack. In such a situation, we would be left with only the POLARIS/POSEIDON deterrent force in our strategic arsenal for high confidence retaliatory purposes. This would pose intolerable risks for American security.

Thus, the critical choice in the face of that situation is this:

1. Do we rely on the fraction of the 656 current weapons that will be at sea on our POLARIS force if we do not convert to POSEIDON and do not defend our land-based strategic forces?
2. Or, do we continue the previously established program to convert 31 POLARIS submarines to the long-approved POSEIDON MIRV program -- which would provide approximately the same number of sea-based retaliatory weapons on alert that we currently have today in the sea-based and land-based retaliatory forces combined, but with much reduced megatonnage?

Pending a successful outcome in the Strategic Arms Limitation Talks, therefore, prudence dictates that we must continue our approved program to MIRV current forces.

Moreover, as the experience of the past five years demonstrates, it would be dangerous and imprudent to place unquestioned reliance on the invulnerability of any single strategic system for more than five to seven years into the future.

This is why we must also, at the very least, preserve an option to defend a portion of our land-based retaliatory forces. That is a major part of what the proposed minimal addition to the SAFEGUARD Defensive program is designed to do. I will come back to that.

Because we want to give the Strategic Arms Limitation Talks every chance of succeeding, we are deliberately accepting certain risks by postponing hard choices related to strategic offensive weapons. These risks are acceptable only in the context of proceeding with the MIRV deployments that have been programmed and approved for several years and the SAFEGUARD increment we are recommending this year.

A second and equally important reason for MIRV is that it helps preserve our deterrent by increasing confidence in our ability to penetrate Soviet strategic defensive forces which, by the mid-to-late 1970's, also could be quite formidable. In addition to the extensive air defense capabilities they already possess, the Soviets are pursuing a vigorous anti-ballistic missile research and development program designed to improve the present operational system or to develop substantially better second-generation ABM components.

We now have evidence that the Soviet Union is testing an improved long-range ABM missile. They are also expanding their radar surveillance coverage. We cannot rule out the possibility that they have or will give the extensively deployed SA-5 surface-to-air missile system an ABM role. We believe such a role is technically feasible for this system.

With regard to SAFEGUARD, which I mentioned previously, let me say this. In addition to other objectives, the reoriented SAFEGUARD program, initiated last year, is designed to provide protection for our land-based deterrent forces, the MINUTEMAN and Bombers. As you know,

the President directed that each phase of the SAFEGUARD deployment is to be reviewed each year to ensure that we are doing as much as necessary but not more than that required by the threat. The increments of SAFEGUARD proposed so far will provide protection for a portion of our land-based deterrent, and permit flexibility with regard to our future course of action.

Without approval by Congress of the Modified Phase II SAFEGUARD protection proposed by the President, we would be forced to recommend going forward this year with other strategic nuclear offensive force programs.

All of my comments so far have, of course, been focused on the more immediate and troublesome threat posed by the Soviet strategic force buildup. The nuclear weapons program of Communist China also concerns us and directly relates to the need for preserving timely SAFEGUARD options as we move toward the mid-1970's. Time does not permit a discussion of this issue and the interrelationship of maintaining adequate strategic offensive and defensive forces to meet both the Soviet and Communist Chinese threats.

Where does all this leave us, and what is President Nixon attempting to do with the decisions he has incorporated in his Fiscal Year 1971 transitional defense budget?

Clearly, this Administration has not accelerated the previously planned deployment of offensive systems during our 15 months in office. On the contrary, we have slowed it down. The only major change we have made has been modification of the previously approved SENTINEL ABM

deployment; and that change was a slowdown, not a speedup. We slowed the original deployment plan Congress approved, keyed it to the emerging threat on an annual review basis, and reoriented it to provide more timely protection needed for our land-based deterrent forces.

If the programmed forces established by the last Administration some years ago and approved by Congress were deemed appropriate and necessary for the security of the United States in the 1970's against the then projected threat, I am at a loss to understand how critics can claim that the Nixon Administration has escalated the arms race. The record clearly shows that we have not done so. We have chosen instead to defer major new weapons decisions as long as possible pending developments in the Strategic Arms Limitation Talks. In continuing the MIRV and ABM programs, we are simply going ahead with programs on which our deterrent policy was formulated by previous Administrations, even before the current momentum of Soviet strategic programs became clear.

With regard to the important talks which have just resumed in Vienna, the President has stated that every U.S. system is negotiable. To those who argue that the U.S. should take specific, and perhaps unilateral, action at the start of these negotiations, I would reply that the place to resolve these issues is at the conference table with the Soviets. Let us try to find out at the conference table the meaning of the Soviet Union's increased weapons deployments and let

us conduct these important negotiations with full recognition of these continuing Soviet deployments.

My appraisal today has covered some of the available evidence of the Soviet military buildup. I am not unmindful, however, of possible other directions of Soviet policy that could be relevant to our security. There have been reports that Soviet economic problems may place pressure upon their leadership to devote major attention to internal matters, thus reducing the recent emphasis on a continued military buildup.

As Secretary of Defense, I will continue to hope that the shift in national priorities we have instituted in America will be duplicated in the Soviet Union. But until evidence of that shift is discernible in weapons deployment activities, I have no alternative but to base my actions and recommendations on the evidence available, much of which I have shared with you editors today and, through you, with the American people.

# # #

UNITED STATES AND RUSSIAN SUBMARINE CONSTRUCTION AND MISSILES

Secretary LAIRD. If we go forward with the ULMS program, Mr. Chairman, we won't get our first submarine until a time when they could have a vastly superior submarine force, in terms of numbers. I believe within a 2-year period they will have the capability and know-how to improve even the existing missile systems that they have on their present Y-class submarine. And we believe that MIRVed SLBMs will be deployed in [deleted] years.

Chairman ELLENDER. This increase you speak of is in which type of submarines?

Secretary LAIRD. I am talking now about the missile-firing submarines.

Chairman ELLENDER. Off the record.

(Discussion off the record.)

Senator CASE. What submarine missiles do they presently carry?

Admiral MOORER. The older missile. They have of the SS–N–5's which have a warhead yield of [deleted].

Senator CASE. That compares with what?

Admiral MOORER. That would compare with the old Polaris, I guess. The Polaris A–2 started with a single warhead at [deleted]. The A–3 has three warheads, each with a yield of [deleted]. They have [deleted] of the SS–N–6 missiles operational and these are the ones that are being added to at a rapid rate in the Y-class submarines.

Senator CASE. There is a single warhead on each missile?

Admiral MOORER. Yes. Each has a single warhead.

POSSIBLE MIRVING OF RUSSIAN MISSILE UNDER DEVELOPMENT

Senator CASE. And the ones they are developing now, are they going to be Mirved?

Admiral MOORER. [Deleted.]

Senator CASE. [Deleted.]

Admiral MOORER. Yes.

Senator CASE. How many miles?

Admiral MOORER. It has a mile range.

Secretary LAIRD. [Deleted.]

It would be diplomatically and politically unacceptable for the United States to allow the Soviets to achieve a large numerical superiority in both land-based and sea-based strategic missiles.

Moreover, there would be an increasing military risk that future technological advances in conjunction with much larger numbers of Soviet strategic missiles, might offset the qualitative improvements we are planning for our land based strategic forces.

ULMS ACCELERATION DECISION

I have carefully reviewed all alternatives for new strategic initiatives and have decided that acceleration of the ULMS program is the most appropriate alternative, since the at-sea portion of our sea-based strategic forces has the best long-term prospect for high prelaunch survivability.

The Navy assures me that this acceleration will permit deployment of the first ULMS submarine in 1978, at least 2 to 3 years earlier than would have been the case in the regular program.

This is dependent on the $35 million supplemental which we have before this committee. In reaching this decision, we considered a range of alternatives, including further modification to existing submarines and construction of additional submarines using the basic design for the latest Poseidon submarines. We concluded that acceleration of the ULMS development program was the best possible course of action available for several reasons including:

ONGOING PROGRAM

First, the ULMS program is already underway as a major development program.

Chairman ELLENDER. How much has been provided for the ULMS development?

Secretary LAIRD. In fiscal 1972, we have provided about $105 million so far and the supplemental would bring it to a total of about $140 million.

Chairman ELLENDER. That is all in the R. & D. stage?

Secretary LAIRD. All under research and development, that is correct. We have provided $61 million in fiscal 1971 and prior years and $105 million apart from the pending supplemental request, in this present fiscal year.

Chairman ELLENDER. You hope it will do what you think it will.

INITIATION BY CONGRESS OF POLARIS PROGRAM AND ADVANTAGES DERIVED THEREFROM

Secretary LAIRD. We have not yet built one of these submarines, but I can assure you, Mr. Chairman, that we have the technology and the capability to do it. I remember that during another administration—in the Eisenhower administration—the Department of Defense was up here arguing against the acceleration of the Polaris program, and it was the Congress, in its wisdom, which accelerated that program in 1956 and 1957. We added funds above the request of the Department of Defense for that program. You all remember that.

I can assure you that it put President Kennedy in very good position in 1962 when the Cuban missile crisis came up, that he had those first Polaris submarines that time. Now, I am asking the Congress to support this program I have given you these four reasons, why I came down making this recommendation.

NUCLEAR FRIGATES

Senator PASTORE. Do you feel, that the Congress ought to take the same initiative on the two nuclear frigates?

Secretary LAIRD. I said that if the Congress appropriates additional funds over and above this budget request, I will see that the funds are expended. Now that is the best promise I can make, and there are not many Secretaries of Defense that have ever come up to Congress and told you that. But since I have been Secretary of Defense, Congress has been cutting my budget every year.

Senator CASE. You would not let the money be impounded?

ULMS PROGRAM ACCELERATION DECISION

Secretary LAIRD. I would see that it was spent. Getting back to ULMS, my second reason for recommending acceleration of that program is that ULMS offers the best technical program currently available to provide future sea-based strategic force capability. It makes the greatest use of new submarine quieting technology, and is capable of carrying a larger ballistic missile than can be fitted in existing submarines.

Chairman ELLENDER. But as you said this morning it will be larger because you can achieve greater range, [deleted].

Secretary LAIRD. [Deleted].

Chairman ELLENDER. I understand that.

Secretary LAIRD. It would give us a much larger area of operation.

RUSSIAN MEGATON CAPABILITY VIS-A-VIS UNITED STATES

I am not trying to match the Soviet Union. You will see that the megaton capability of the Soviet Union far outstrips anything the United States has at this time. I am not trying to match that.

Chairman ELLENDER. You refer to land-based missiles?

Secretary LAIRD. All missiles. The total strategic nuclear megatonnage that they can launch is much greater than ours.

Chairman ELLENDER. You also include the submarines?

Secretary LAIRD. They go ahead of us in numbers of submarines in 1973.

Chairman ELLENDER. I am talking about this present time.

Secretary LAIRD. Right this minute, as far as submarines are concerned, the total megatonnage——

Chairman ELLENDER. My reference was to the individual missile.

Secretary LAIRD. We can give you the submarine megatonnage now.

Admiral MOORER. [Deleted].

Chairman ELLENDER. You mean for each missile?

Admiral MOORER. [Deleted.]

Secretary LAIRD. The option to deploy this large ULMS missile provides the flexibility for increased range, and hence larger operating area at sea, or alternatively a capability to carry large, more advanced penetration payloads at less range, should this be desirable in the future.

ALTERNATIVE COURSE OF IMPROVING LAND-BASED MISSILES

Senator PASTORE. In a comparison of land-based missiles, the Russians have exceeded us in numbers.

Secretary LAIRD. Around 1,500 to about 1,000.

Senator PASTORE. If we do not decide to go along with the ULMS program, will we have to reconsider this disparity in land-based missiles?

Secretary LAIRD. I don't think there is any question about that.

Senator PASTORE. We are talking about alternatives.

Secretary LAIRD. Yes. I examined that in making this recommendation and I came down in favor of this program. Congress can reverse that.

Senator PASTORE. In other words, rather than suggesting the choice of closing the gap between the 1,000 and 1,500, you believe it is more desirable for us to put our money in the ULMS.

Secretary LAIRD. I think so, not only for that reason but also because of the tremendous program they have in ballistic missile submarines.

Senator CASE. What ABM limitation has an effect here? ABM's are not included in limitations on submarines. This is not said critically. It is just an observation.

Secretary LAIRD. We would like them included. We would like to have a limitation.

Chairman ELLENDER. Mr. Secretary, I cannot quite follow what you are saying as to the number of missiles. If you do build [deleted] ULMS, as you propose, that means that each of these submarines will carry from 20 to 24 missiles.

Admiral MOORER. Yes. So that would be [deleted] missiles.

Chairman ELLENDER. [Deleted].

Secretary LAIRD. Yes, but it is the launch tubes that are important. The Soviets can MIRV their sub-launched missiles. They may be 2 years behind us in technology, but with their testing program that is going on now——

[Deleted].

Chairman ELLENDER. I had concluded from testimony given to the committee that the greater accuracy of our missiles tends to offset the advantage the Soviets have in the larger yield warheads.

Secretary LAIRD. They are going the other way now, Mr. Chairman.

Chairman ELLENDER. But from your earlier statements, I take it you feel we are ahead of them in technology.

Secretary LAIRD. We are superior technically now. I have tried to make that statement all the way through, that our technology gives us an advantage at the present time, but I believe that they have this capability to develop these systems too. I think we have about a 2-year lead in MIRV technology. I would like the chairman to address that point.

WARHEAD DAMAGE FACTORS

Admiral MOORER. May I briefly run through this problem.

With a given missile, you can trade off range for payload. For instance, in the case of the Poseidon we can operate anywhere from reentry vehicles. Now the damage effect of any one warhead is determined by three factors. One is the hardness of the target. Two is the accuracy. And, of course, three is the yield of the weapon.

For instance, if you have a [deleted] pound per square inch hard system with the current Minuteman III, it would be necessary to hit within [deleted] feet or so of it to destroy it. So what we are saying, in the ULMS missiles, in the new missiles, we will have the option of selecting either a larger yield and fewer warheads, or more warheads and a smaller yield which would be determined by the accuracy that can be built in the missile with the improving technology.

So all of these things are tradeoffs. The Soviet missiles, as you have observed, are not as accurate as ours. They have emphasized large warheads. As a matter of fact, they exploded a 25-megaton warhead just before they signed the test ban.

I will show you my table and you will see that almost without exception their warheads are significantly larger than ours, but their accuracy is not as good as ours.

Senator PASTORE. Is it not part of the story though, that when we were considerably ahead in the number of our Minuteman land-based missiles, and they were behind, they tried to overcome the disparity in numbers with the size of their megatonnage?

Admiral MOORER. And disparity in accuracy.

U.S. AND RUSSIAN DECISIONS RESPECTING MEGATONS

Senator PASTORE. In other words, they were talking about destructive power and were measuring that in the yield of the weapon as against our numbers of smaller caliber. But the trouble is they did not stop there. They continued construction and they passed us. Not only do they have more than we have, but they have heavier missiles. But their original policy was to try to match us, not with numbers but with yield. In the process they kept up production and now they have 1,500 and we only have 1,000 of them and theirs perhaps have factor of three to one heavier than ours.

Admiral MOORER. Yes.

Secretary LAIRD. In mid-1972 they will be well ahead of us in strategic missile launchers.

Senator PASTORE. I am trying to answer the problem presented by the chairman who wants to know why we went to the smaller yield. It was because we had so many of them that we designed them that way.

Admiral MOORER. And we had the accuracy.

Chairman ELLENDER. I recall some testimony to the effect that we could have had a larger yield warhead on the Poseidon, but to do so would reduce the range. Does the use of the MIRV warhead reduce the total megatonnage delivered by the missile?

MIRVING EFFECTS

Secretary LAIRD. Mr. Chairman, we have given up megatonnage in order to MIRV the missile system. Now MIRVing does not necessarily in itself gives us more or less accuracy. We have developed a MIRV system that has good accuracy, but you can certainly have a single warhead system that has good accuracy too. MIRVing itself complicates the question of accuracy but, it does not add to the accuracy.

The reason that Secretary McNamara gave to our committee for going ahead with the Poseidon MIRV program when we approved it back in 1965 was the ABM. That is the reason he used to justify that system. It was not a question of accuracy.

ICBM FORCE LEVERS

Chairman ELLENDER. I am still not convinced that the best way to increase our strategic capability is to increase the sea-based missile force. It seems to me this decision ignores the success of the Minuteman II and III programs.

Secretary LAIRD. The decision on ICBM force levels was made prior to my becoming Secretary of Defense. It was proposed by Secretary McNamara and approved by the Congress back in the 1960's. You remember that. You were on the committee at the time.

I remember that very well, and maybe we want to include a little history on this for the record. Because it was back 10 years ago.

(The material follows:)

The recommendation to hold ICBM force levels at 1054 was made by Secretary McNamara, in his FY 1966 Posture Statement.

At that time, he explained the recommendation as follows:

"The second major issue involved in our general nuclear war program concerns the future size of the strategic missile forces. Last year we had tentatively planned to fund another 100 MINUTEMAN silos in each year FY 1966-1967 (for a total of 1,200 missiles).

"On the basis of our analysis of the general nuclear war problem in the early 1970s, I am convinced that another 200 MINUTEMAN silos are not required at this time. We now believe that we can markedly increase the 'kill' capabilities of the MINUTEMAN force through a number of qualitative improvements which now appear feasible. The MINUTEMAN force presently planned for FY 1970 will have a total destruction capability of at least 30 to 40 percent greater than a force of the same size consisting only of MINUTEMAN I. This is equivalent to adding 300 to 400 missiles to a force of 1,000 MINUTEMAN I. With the additional improvements which now appear possible, the destruction capabilities of the MINUTEMAN force could be further increased in the future, if that appears desirable, by a factor of two compared with a force of the same size consisting only of MINUTEMAN I."

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"In view of the fact that we will have 800 MINUTEMAN and 464 POLARIS missiles in our operational forces by the end of the current fiscal year, I believe we can safely phase out all of the ATLAS and TITAN I missiles during the current fiscal year. These older cryogenic liquid-fueled missiles are very costly and difficult to maintain on alert status. The ATLAS and TITAN forces cost about $1 million per year per missile to operate and maintain, compared with only about $100,000 per missile for the MINUTEMAN."

The Congress, in its approval of the FY 1966 Defense Budget, considered the question of ICBM force levels as shown, for example, in the following passage of Testimony before the House Appropriations Committee, but did not make any adjustment in this force level.

The following passage is from a hearing before The Defense Subcommittee, House Appropriations Committee, March 4, 1965:

Mr. MAHON. The thread running through all this discussion here this morning, I repeat, is the adequacy of this budget for fiscal 1966. If it is not adequate where are the inadequacies? I would like to raise this question with you. At one time we talked about a much larger number of MINUTEMEN missiles than we are now talking about. The original plan of the Air Force went far above what the present plan proposes. I do not know how hard these estimates were, but the plan or the tentative plan was for a considerably larger number. I have in mind 2,600, but this may be in error. Maybe you can correct me here. Last year you projected a larger number of the MINUTEMAN than you project this year, is that correct?

Secretary MCNAMARA. Last year, Mr. Chairman, we projected a buildup to a total MINUTEMAN force of 1,200 missiles. This year we project a buildup to a force of 1,000 missiles. Two factors have caused us to reduce the number from 1,200 to 1,000. The first and by far the most important is the improved capability per missile which we will receive from increases in the accuracy of the missile, increases in the range and payload of the missile. The second factor affecting the decision is our current evaluation of the threat.

(Discussion off the record.)

Secretary MCNAMARA. But our superiority is so great. We have shown that by June 30 of this year we will have 854 ICBM's on launcher and 416 POLARIS missiles (which deployed are equivalent to ICBM's in terms of targeting), a total of 1,270 ballistic missiles ———. Their total missile strength targetable against us will be but a small fraction of our strength. The vast superiority we have is demonstrated by those figures.

Mr. ANDREWS. May I ask a question, Mr. Chairman?

Mr. MAHON. Yes.

Mr. ANDREWS. Mr. Secretary, have you updated or upgraded or modernized your MINUTEMAN and are now in the process of doing that to the point that you have a much better missile than you had 2 years ago?

Secretary MCNAMARA. That is correct. Unfortunately we contributed to a misunderstanding on this point by using the word MINUTEMAN–II to describe a missile that is as different from the MINUTEMAN–1 as the B–52 is from the B–47.

Mr. ANDREWS. How many targets can you train the MINUTEMAN missile on now?

Secretary MCNAMARA. The early MINUTEMAN missiles could be pretargeted on a very limited number of targets, that is, with an ability to shift from one to the other by remote control. The later MINUTEMAN missiles will have capability of targeting on many more different targets with ability to shift by remote control.

Mr. ANDREWS. That increases your capability tremendously.

Secretary MCNAMARA. It does. But the far more important advantage of the MINUTEMAN–II versus the MINUTEMAN–I is the increased accuracy which will mean that the circular error problem will drop ——— and that reduction will increase the destructive potential of the missile by between four and eight times.

Mr. ANDREWS. When will the missiles in your inventory and on pad have a capability of targeting on ——— targets?

Secretary MCNAMARA. It will be soon.

Mr. ANDREWS. Do you have any now that can be so targeted?

Secretary MCNAMARA. Not in the MINUTEMAN system, but in the POLARIS system we have well-nigh complete retargeting flexibility, because the commander of the POLARIS submarine has on board the submarine, cards that permit him to change the target of any missile within a matter of seconds. He simply takes out one card and puts in another, this is literally a 30-second job. He can target any target within the range of his submarine.

Mr. ANDREWS. Do you have enough of what you have now?

Secretary MCNAMARA. Without question, in my mind.

Mr. ANDREWS. Any above that would be an overkill?

Secretary MCNAMARA. On the basis of what we know now, I think it would be an absolute waste if we were to procure additional missiles. I simply submit for your consideration on that point the comparison of our forces and those of our potential enemy which is in my classified statement and which shows our overwhelming superiority for us today and maintenance of that same superiority in fiscal 1966 and 1967.

Mr. ANDREWS. Can the figures you have just made be published?
Secretary MCNAMARA. No, sir, I think they can remain only in the classified record.
Mr. ANDREWS. I am going to quote you many, many times.
Secretary MCNAMARA. I will be happy to be so quoted on the overall conclusion.

SUBSTITUTION OF UNTRIED WEAPONS

Secretary LAIRD. I remember that well, and I also remember the little discussion we had when Senator Russell did not want to go to the Poseidon and we compromised. We put in two instead of four Poseidon conversions in fiscal 1968.

Senator YOUNG. Senator Russell was always cautious about immediate substitution of an untried weapon for one that was proved reliable. He remembered a demonstration during which the new missiles failed to function.

REQUIREMENT FOR FEWER SHIPS AND CREWS

Secretary LAIRD. I would like to give the third reason I am recommending acceleration of the ULMS programs.

Mr. Chairman, continuing on page 118, of my classified report, deployment of ULMS, with a capability to carry a greater number of large missiles, means that a given nuclear payload can be deployed with fewer boats and crews.

POSSIBLE RETROFITTING OF ULMS I INTO POSEIDON SUBMARINES

Finally, the ULMS missile development program will permit an option to retrofit the shorter range ULMS I missile into Poseidon submarines in the future, should that be desirable.

A total of $942 million is being requested for the ULMS program in fiscal year 1973; $520 million for development; $395 million for procurement and $27 million for military construction.

PROGRAM EXPENDITURES

Senator YOUNG. How much have we spent?
Secretary LAIRD. We provided $61 million in fiscal 1971 and prior years and $105 million in fiscal 1972.
Chairman ELLENDER. And you have $35 million——
Secretary LAIRD. We are asking for an additional $35 million in the supplemental.
Chairman ELLENDER. That is aside from this?
Secretary LAIRD. That is correct.

The ULMS program we are proposing will be discussed in further detail by other witnesses before the Congress. I am confident Congress will understand the need for accelerating the ULMS program, and will continue to provide this program the excellent support which it has received in the past.

B–1 STRATEGIC BOMBER

The fiscal year budget includes $445 million to continue engineering development of the B–1 intercontinental bomber, intended to replace the aging B–52 fleet. The B–1 is being designed to improve capabilities

over the B–52 through faster reaction, increased resistance to nuclear effect, shorter escape times, longer range, greater payload, higher speeds at both high and low altitudes, reduced infrared signatures, decreased radar cross sections, and greatly increased ECM capabilities.

Senator CASE. What does that mean?

Secretary LAIRD. That means the capability to defend against attacks upon the aircraft with electric countermeasures.

HIGHER ALTITUDE AND PENETRATION CAPABILITY

Chairman ELLENDER. Admiral, I am sure you are familiar with the Air Force's B–70 bomber program. As I recall we spent about $1.5 billion on that aircraft before it was terminated. The B–70 was to be a high-altitude aircraft, and one of the principal reasons it was canceled was because of the improvements the Soviets made in their high-altitude air defense capabilities.

Admiral MOORER. That was part of the story, Mr. Chairman. As I recall Mr. McNamara canceled the B–70 in line with moving into the MIRV program and so on. It was a more or less re-look at the entire strategic capability. This airplane, however, is quite different from the B–70.

Chairman ELLENDER. I understand that the B–1 is being designed for low-level attack in order to fly under the Soviets' air defense radars.

Admiral MOORER. Yes. Those are the tactics that are used; lower altitude for penetration.

DEFENSIVE CAPABILITIES AGAINST BOMBER

Chairman ELLENDER. Since the Russians have been so successful, according to your own testimony, that they can build a defense against most of our missiles, how do we know they are not going to provide some kind of hardware that will make the B–1 vulnerable?

Admiral MOORER. As I will show you, it is true, that the Soviets have a very large scale air defense system, but as mentioned here in the Secretary's report, the aircraft will be equipped with ECM capability; that is, they will be able to jam the control system and surveillance radar.

Secondly, it could carry both a missile which will be a decoy and another missile which will be a standoff missile which can be fired ahead like a rocket to destroy the defenses of the other side as it penetrates.

Chairman ELLENDER. But you are now providing such equipment for the B–52, such as the decoy system.

Admiral MOORER. Yes; and that could also go on the B–1.

COST OF DEVELOPMENT PROTOTYPES, EVALUATION AND TESTING, AND SPARES

Chairman ELLENDER. Now, am I correct in saying that before you get the B–1 in production, the cost would be in excess of $2.6 billion? I just want to get the facts straight.

Secretary LAIRD. You mean to develop three prototypes? We are developing three prototype aircraft. The cost up through development and testing of these three aircraft, before a decision is made whether to produce it, is expected to be about $1.6 billion. The testing program

provides for three aircraft. There has been no decision to produce, but if the aircraft is produced, the entire development cost is the number you referred to of about $2.6 billion.

The total funding involved was $319 million in fiscal 1971 and prior years, and $370 million in fiscal 1972. In fiscal 1973 we are asking for $444.5 million for this program. We do not expect to flight test the aircraft until 1974.

Chairman ELLENDER. We were given the figure of $2.6 billion. What is that?

Senator ALLOTT. Mr. Chairman, may I interrupt at this point to refresh your recollection. I think General Glasser gave that figure. I think he gave it in the context that the additional amount over the $1.4, or $1.6 was for evaluation and testing and and spares.

Secretary LAIRD. That is moving toward production decision.

Senator ALLOTT. Is that correct?

Chairman ELLENDER. On page 184 there is a total cost estimated at $2,618 million.

Secretary LAIRD. That is the currently estimated development cost.

Chairman ELLENDER. The $2.6 billion is the total cost of R. & D. The cumulative R. D. T. & E. cost through the "production go-ahead" milestone is $1,889 million. These figures are found on page 184 of the B–1 Descriptive Summary.

Senator ALLOTT. The statement I made was essentially correct then.

Secretary LAIRD. That is what he was testifying to.

The development program includes test and evaluation of three prototypes, but additional development would be required after they are completed.

PROGRAM—B–52 UPGRADING COST COMPARISON

Senator CASE. Did we not, in connection with ULMS, ask that there be put in the record some kind of comparison between the cost to upgrade Polaris or Poseidon with new submarines and more advanced missiles?

Secretary LAIRD. Yes.

Senator CASE. Could we have a similar comparison in regard to the B–52 and B–1?

Secretary LAIRD. To open up a B–52 line?

Senator CASE. Yes, open it and make it comparable. We have had people say this aircraft is not going to be that much faster or have much greater range of capability. I wonder if we could have some figure to show what it would take to open up the B–52 production line.

Secretary LAIRD. We will be glad to supply those figures.

Senator CASE. With any comment you want.

Secretary LAIRD. We can put those figures in the record.

(The information follows:)

The cost to open the B-52 line cannot be determined without detailed study using contractor assistance. The cost of restarting an aircraft production line is influenced by many factors. Among the most important are the length of time the line has been shut down, the disposition of the tooling and fixtures, the number of contributing vendors and suppliers, the production rate and duration, and the current availability of the personnel, skills and facilities which the line utilized. In the case of the B-52, the production line has been closed down since October 1962. In the intervening years, tooling has been disposed of, B-52 associated skills have been permitted to lapse and personnel and facilities have been put to other uses. The fact that hundreds of separate suppliers constituted the overall B-52 production capability compounds the difficulty of determining the total restart cost. A preliminary estimate would place the reopening cost between $300 M and $ 600 M.

Because of the foregoing considerations, the following cost comparisons are offered as perhaps a more meaningful basis for assessing the relative cost of the B-52. If we go back to the period (1957-61) in which these last 295 B-52s were funded, we see that the average unit procurement cost of the B-52G/H was $10.9M in "then year" dollars.

But, there is a problem in accepting this figure as a starting point. The cost of the G/H aircraft was strongly influenced by the fact that these airplanes were produced at the end of the B-52 production (744 aircraft). Thus,

to derive a more accurate comparison, one would initially want to know what the B-52G/Hs might have cost if they had been the first B-52s produced. Using a production figure of 250 as a basis for discussion, we need to adjust the baseline B-52G/H cost ($10.9M) by a "learning curve" factor as though they were the first 250 B-52s produced. If this is done, the average B-52G/H unit procurement cost rises to $17.4M -- again in the "then year" dollars of the G/H production period. It must be adjusted again to take into account the intervening inflation of the economy since 1961. Said another way, the average B-52G/H, if it had been among the first 250 B-52s produced and had been purchased in 1973, would have had a unit procurement cost of $29M.

CAPABILITIES OF B–1 AND B–52 BOMBERS

Chairman ELLENDER. I am sure Senator Case can tell you as well as I can that there has been a great deal of discussion by members of the Congress in opposition to the production of the B–1 bomber. As far as I am concerned, I hope you will make the best case you can, not only for the B–1, but also the ULMS program and the aircraft carrier.

Senator YOUNG. I think you ought to make a case for the different capabilities of the B–1 and the B–52. I think the purpose is entirely different.

Secretary LAIRD. One is supersonic and one is subsonic. One is 20 years old.

Senator YOUNG. One is designed to fly low and the B–52 was not. Is that right?

Admiral MOORER. The B–52 has been modified so it can fly low.

Chairman ELLENDER. That is exactly what has been stated.

Senator YOUNG. It was not originally designed to fly at low altitude.

Admiral MOORER. I think the real answer is the B–52 has exhausted its growth potential. It has been modified. It is so old now that it will be over 20 years old when this airplane comes into use.

Senator YOUNG. You just shot down the main argument that I heard for the B–1; that the plane could fly low over the target. That is what General Glasser told us, I understood in this respect it would be better than the B–52.

Admiral MOORER. The B–52 can fly low, but its speed is much less than the B–1.

Secretary LAIRD. I would like to point out that, by the time we have any number of B–1's operational the youngest B–52's at that time will be around 18 years old.

Chairman ELLENDER. You refer to the ones you have on hand, but what we were talking about was to take that same plane and rebuild it.

Secretary LAIRD. This is a whole new production process. We have no plant, no production line. The youngest B–52 was produced about 10 years ago.

Senator CASE. What would it cost to rebuild it? This would be a fair comparison, as well as a comparison of the capability the admiral was talking about.

ABSENCE OF BUY OPTION IN DEVELOPMENT CONTRACT: FLY BEFORE BUY

Secretary LAIRD. As Secretary Seamans indicated during his recent appearance before the Congress, the B–1 engineering development contract with North American Rockwell is a cost-plus-incentive-fee contract with no provision for a buy option.

I want to emphasize that we will not commit the B–1 to production before performance requirements are demonstrated. The program provides for seven basic milestones, and was changed significantly last year when two test aircraft were eliminated and other adjustments made in the development program. The first flight is scheduled for April 1974.

Senator CASE. There is no commitment to buy.

Chairman ELLENDER. That is a new concept they have instituted to "Fly before you buy."

Secretary LAIRD. We have done that with the F–15 and that was one of the first contracts let on this basis. When we do anything on a

contract like that—again I think we can even improve that—but that is the first major one where we went to this milestone approach, although the S–3 contract contains some elements of it.

We have a decision to make in October on long lead time funding for the F–15. Then in February 1973, when we must make the actual production decision on the first wing, we will have 120 hours on the aircraft. After this I am recommending to whoever takes my job after I depart on January 20—I would provide for more hours than even the F–15 contract calls for.

This is something that we are feeling our way on but it is something where I think we have made real improvements. But the B–1 came after the F–15 and we improved it more as far as the contracting procedures are concerned.

Senator CASE. I think we ought to do everything we can not to tempt these companies to overreach themselves and get into a position where we have to bail them out at 10 times the cost. That is the kind of thing we have done in the past.

Chairman ELLENDER. Off the record.

(Discussion off the record.)

PARTICIPATION BY FRANCE IN NATO

Senator ALLOTT. I want to ask, to what extent has France been participating in NATO or NATO operations in the last year?

Secretary LAIRD. In a military sense we have had some French cooperation in NATO activities in the Mediterranean. In a political sense they have continued to maintain their seat on the Council, but they do not participate in the Defense Planning Committee at the present time.

Senator ALLOTT. There is no change other than participation in the Mediterranean maneuvers?

Admiral MOORER. Essentially bilateral training exercise. In other words they will train with U.S. forces any time we suggest, Senator Allott. Of course, they have forces in Germany, ground forces in Germany, and they train with the Germans. They are willing to talk to the German Government or U.S. Government or U.S. forces or the German forces, and they are ready to train on this basis. They will simply not participate on the basis of a NATO military structure so far. But I think that the trend is away from the very hard line that they took at the time of De Gaulle.

U.S. CLAIM FOR FRENCH PAYMENT OF CAPITAL INVESTMENTS

Senator ALLOTT. One other question. Have we ever made any settlement or have they ever made any payments to us in return for the capital investments we have had in France at the time they severed a NATO relationship?

Secretary LAIRD. We have not settled that claim as of this date. I can give you the full background on that if I can put it in the record at this point.

Senator ALLOTT. I wish you would.

(The information follows:)

In March 1966, France requested the U.S. and NATO to remove their forces and facilities from French territory. In 1968 and early January 1969, the U.S. made two approaches to the Government of France to present a claim for damages. The U.S. claim totals [deleted], comprising [deleted] for loss of use of facilities and [deleted] for movement costs. Other NATO Allies agreed to finance up to [deleted] of U.S. relocation costs on the understanding that they would share in any proceeds from the U.S. claim against France.

NATO also presented a claim against France totalling [deleted], of which [deleted] is for loss of facilities and [deleted] is for movement costs.

Both the U.S. and the NATO claims were developed on essentially the same basis. In each case, the aggrieved party felt itself entitled to compensation for the value of the entire remaining useful life of the facilities which, because of the French decision in 1966, were no longer available for the previously agreed defense purposes. The amount of compensation was adjusted to take account of annual increases in construction costs. Movement costs associated with relocating forces and facilities outside France were included in the claims.

France has not responded formally to either the U.S. (or the NATO) requests for negotiations on these claims but has indicated in response to U.S. inquiries that the claim was under study. The 1968–69 French economic and financial crisis and the changes in the French Government following President de Gaulle's departure may have slowed French consideration of these matters. However, U.S. Ambassador Watson raised the matter with Under Secretary Alphand of the Foreign Office in late 1971 and as a result working level discussions between U.S. Embassy and Foreign Office Representatives have begun.

The French Government recently made payment of some $183,000 for improvements made by the U.S. Army to a hangar at Metz which the U.S. returned and is now used by the French.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that questions submitted by him be answered for the record. The questions and the responses will appear at this point.

(The questions and answers follow:)

RESERVE DRILL PARTICIPATION

Senator THURMOND. We understand that in some of its reserve programs the Navy has authorized up to 120 drill periods per year. What are the other Services doing to improve readiness posture with increased participation in drills?

Secretary LAIRD. The other Services also authorize additional drill periods in certain selected programs. They help both to improve readiness and to permit additional active duty training for the transition to new or upgraded equipment. Both the Air Force Components and the Marine Air Reserve authorize 36 additional drills per year for combat flight crews. Army Guard and Reserve units allow 24 extra drills per year for aviators and flight crews, as well as an additional 12 drills for personnel in certain technical and readiness areas. The Army Reserve also permits the use of a number of additional drills for the testing of new training concepts.

ALLIED RESERVE CAPABILITY

Senator THURMOND. On page 13 of your classified posture statement, you indicated that Total Force planning included "both Active and Reserve Components of the U.S. (and) those of our allies. . . ." What can you tell me about the capabilities and readiness of the reserve forces of our NATO Allies?

Secretary LAIRD. Our NATO Allies provide substantial reserve forces for the common defense [Deleted.] Many of the Allied reserve unit structures are support forces, the primary purpose of which is to provide sustaining power in a prolonged conflict.

All of our Allies have highly efficient reserve call-up systems and very detailed contingency plans. [Deleted.] The Federal Republic of Germany (FRG) has sent observers to the United States to examine our National Guard and Reserve system in an effort to improve its own.

In summary, the NATO Allies have a significant reserve capability; their systems have some deficiencies but programs are underway to improve this important element of the total defense program.

IMPORTANCE OF RESERVE ROLE

Senator THURMOND. We believe more should be done to let our reservists know how important their role will be in our national security picture. Under the total force concept we could sink or swim on the strength of our reserves. Is this message being transmitted to the reserve and guard?

Secretary LAIRD. In our speeches, statements, and press releases, before a variety of organizations and audiences the message of unprecedented reliance on the Guard and Reserve is being stressed by the leadership, military and civilian, of the Department of Defense. This message has been reinforced by new mission assignments and the greatly increased flow of modern equipment to the Reserve Components in the last few years. I believe the Reserve community is convinced of the importance of its role in the total defense picture and further, is keenly aware of the responsibilities attendant on this new importance.

RESERVE DRUG ABUSE PROBLEM

Senator THURMOND. Do you currently have any problem with drug abuse in the Reserve Components similar to the situation in the active forces?

Secretary LAIRD. The proportion of drug addicts in the Reserve Components is less than the percentage of adults who are addicts in the civilian communities in which the Reserve units are located. This may be because addicts have little motivation to join or remain in the Guard or Reserve and because physical examinations are required of Guardsmen and Reservists.

Action and Reserve Force Mix

Senator Thurmond. Are you satisfied that the mix of Active forces and Guard and Reserve forces has been thoroughly evaluated to provide the nation the most economic and meaningful force structure and meets the needs of national security?

Secretary Laird. There is no question that our continuing emphasis on the need for real Total Force Planning has created more receptive staff attitudes toward objective consideration of the Guard and Reserve potential. Also, the actions of the Congress in making mobilization of the Guard and Reserve the only expansion option without additional Congressional authority has caused some real soul searching among Defense planners who may, in the past, have given more lip service than actual thought to use of the Reserves.

The priority concern at this point and should be the correction of deficiencies in readiness which have been allowed to exist in some units of the Guard and Reserve. As we get nearer to meeting mobilization and deployment requirements, the time will be right to make further changes in the mix which will take advantage of additional economies which may be possible. Until we reach that point, I do not think it is realistic to reduce active forces below minimum requirements on a gamble that newly created Guard and Reserve units can develop overnight the capability to replace existing active force capability. I am convinced, however, that the combat capability of Reserve forces can be economically maintained at a level compatible with early deployment.

Naval Reserve Carriers

Senator Thurmond. Is it true that the Navy is considering the employment of carriers in the Naval Reserve? We would like you to provide complete details on these plans.

Secretary Laird. [Deleted.]

Army-Marine Reserve Readiness

Senator Thurmond. I understand that the Marines can deploy a combat-ready reserve division within 60 days. This indicates to me a high state of readiness. Why can't the Army attain a readiness posture comparable to that?

Secretary Laird. The Marine Corps can deploy a combat ready reserve division because the Marines are equipped and trained with new or combat serviceable equipment. The Army, on the other hand, has had a large deficit of equipment assets and is just now approaching 45% of deployment equipment. They expect to reach Level 3 by the end of FY 1973 for early deployment units. With continuing command support, flow of modern equipment, and incentives for manning as needed, as well as an effective training program, I have complete confidence the Army has the capability to accomplish what the Marines have already done.

Earmarking of Reserve Funds

Senator Thurmond. Can you break down the total FY 1973 cost for the Reserves of $4.1 billion to tell me what proportions of the funds would support units earmarked for NATO or for the Far East; or units which would stay in the U.S. during a war?

Secretary Laird. Because of the way in which Guard and Reserve funds are programmed they cannot be broken down into these categories. However, I will provide for the record a breakdown of Selected Reserve manpower strength.

The major part of the increase to $4.1 billion will be used for increases in pay provided by Congress, equipment procurement to fill the void left as a result of equipment starvation in prior years, deferred construction of prior years, and the larger operations and maintenance costs of readiness.

(Additional classified information was separately furnished to the committee.)

Reserve NATO Requirement Schedule

Senator Thurmond. Your presentation today certain recognizes the "real world" when we consider the need to get the reserve into shape to meet the NATO requirement schedule. When do you feel the Reserve and Guard can meet this requirement from a readiness and time standpoint?

Secretary Laird. Reserve Component units that have early deployment schedules for NATO will be ready to go by end of FY 1973. By that time we will be

able to provide [deleted] battalions to round out Active Army Divisions within [deleted] weeks after mobilization, and [deleted] combat brigades, plus [deleted] Armored Cavalry regiment within [deleted] weeks after mobilization. In addition, we expect to have [deleted] National Guard Divisions which can be deployed by [deleted] provided sufficient personnel and weekend training facilities are made available to them.

Naval Reserve Organization Study

Senator Thurmond. I understand that, although the Naval Reserve has been studied and re-studied, a new investigation of its organizational structure is now underway. Is this constant change causing instability and confusion among the Naval reservists themselves? Would you comment on this problem and tell us what attention your office plans to give it?

Secretary Laird. As a result of many factors, including the 1968 Pueblo call-up, the Navy has conducted a number of studies and also made certain organizational changes which have created a much higher readiness posture. Examples are the organizing of the Naval Air Reserve into combat capable wings and squadrons, the nicorporation of Naval Reserve ships into the Fleet, the assignment of modern ships and aircraft. In addition, the increased emphasis on management has also reflected the Navy's renewed interest in its Reserve as a realistic part of the Total Force.

This is certainly good news. On the other hand, I think it is bad news that some of this programming and some of this attention has led to personnel turbulence. I would hope that any adjustments needed to attain greater readiness will be carefully evaluated to assure that there is significant gain and minimal turbulence.

Strength Justification

Senator Thurmond. What is the strength justification for each of the Reserve Components and Guard?

Secretary Laird. Guard and Reserve force strength is determined as part of the planning and risk assessment of the Total Force requirements, and we expect to give considerably more attention to this aspect of our planning in the future.

It is my understanding that each Military Department has provided the Committee with a statement detailing its specific requirement for Guard and Reserve strengths.

Readiness of Army Reserve

Senator Thurmond. Assuming a regular Army division is 100 percent ready, to what degree, percentage-wise, do you feel a reserve or guard division could match this state of readiness? Why?

Secretary Laird. I believe it is possible for a Guard or Reserve unit to closely approach the degree of readiness of a regular unit, provided that the funds and other support resources are made available to meet the level of readiness required. I think that the examples of the Air National Guard and Air Force Reserve—which the Naval Air Reserve is rapidly approaching—where real and timely capability (72 hours to 30 days) has been produced in units possessing sophisticated weapon systems and highly technical personnel skill requirements, are indicators that comparable success can be attained in ground force units requiring somewhat lower personnel skills. The readiness of the 4th Marine Division to deploy within 60 days is further evidence that increased readiness is attainable in ground units.

We must maintain our active forces at realistic levels necessary for adequate deterrence. This requires that we properly estimate attainable capability in any reserve component before we decide to substitute reserve components for active force requirements.

The Administration's policy of increased reliance on and readiness of the National Guard and Reserve Components' Selected Reserves requires realistic readiness and early deployment capability to be effective. To assure that this policy is practicable and attainable, extraordinary efforts have been implemented and continue in the Military Departments as we overcome the long period of relative neglect. An evaluation of whether or not the policy is working should consider where we were in FY 1969 and where we intend to be by the end of FY 1973, and I will provide information on that for the record.

(The information follows:)

Fiscal Year 1969

Army Guard and Reserve.—Crippling shortages existed in combat serviceable equipment (particularly in communications, electronics, and aviation). Only 34.8% of training allowances (80% of mobilization requirement) were available. Units were organized under Tables of Organization and Equipment not compatible with Active Forces. *Training* was restricted and not satisfactory because of critical shortages of equipment and lack of weekend training areas for maneuver units. Priorities for equipment were below Active units and management was not in the hands of the Guard and Reserve Chiefs. Some units were not assigned mobilization missions. Morale was damaged by the long fight (December 1964 to September 1967) as to whether or not Guard and Reserves would be merged. Construction of training centers, armories, and facilities had been frozen during the same period. Readiness data was not available.

Naval Reserve.—The ships of the Naval Reserve were not mission capable or compatible with the Active Fleet, and were useful primarily only as static training ships. The Naval Air Reserve had no combat serviceable aircraft and no units organized to serve as such when mobilized. The main capability was to provide individual reinforcements to the Active Navy. Unit (hardware unit) capability was almost non-existent. Mobile Construction Battalions had little equipment available for mobilization.

Marine Corps Reserve.—The 4th Division was on its way to becoming a "mirror image" of an Active Marine Corps Division. But effects of reorganization from the 1964 concept of the Division as a reinforcement training vehicle were still being felt and some reorganization was still underway and planned. The 4th Wing was equipped with unserviceable aircraft.

Air Guard and Reserve.—Certain elements of the ANG and Air Force Reserve which had received priority support under the Air Force's "Combat Beef" and "Beef Broth" programs were highly ready. However, the inventory included outmoded aircraft F–84s, F–86s, and C–119s in large numbers albeit they were combat serviceable. Generally, these forces had a high degree of combat readiness as compared to the other components and received better priority in support from the Active Air Force.

Fiscal Year 1973

Army Guard and Reserve.—A major reversal in the equipment picture has occurred. Issues of combat serviceable equipment amounted to $300M in FY 70, $726M in FY 71, $915M in FY 72, $1B in FY 73 (estimated), as compared to the *minus* $72M in issues that occurred in the 1965–1969 timeframe. By the end of FY 73, 99% of authorized aviation assets should be delivered and all obsolete aircraft withdrawn. The Chiefs of ARNG and USAR have been designated as managers and provided authority and responsibility for their respective Selected Reserve. Priorities have been established and missions assigned which give Guard and Reserve units—with equivalent missions to Active forces—similar priorities. A readiness reporting system is functioning. Units are completing reorganization in FY 72 to be compatible with similar units in the Active forces. Weekend training areas are available for almost 40% of the maneuver units. Accelerated construction and facilities programs are underway. Technicians have been increased by over 6,000 to provide maintenance and support for increased equipment flow.

Naval Reserve.—The Naval Reserve surface forces have been upgraded to provide more modern ships capable of operating with the Active Fleet. The unserviceable and obsolete ships have all been withdrawn. At the end of FY 73 there will be a total of 58 Naval Reserve Force ships:—increased in FY 72 by three destroyers and three minesweepers; in FY 73 by three minesweepers and two tugs. There is a possibility of Naval Reserve carriers entering the Reserve inventories in FY 74 and FY 75.

The Naval Air Reserve has been completely reorganized to provide units capable of serving as units when mobilized. All unserviceable aircraft have been replaced by combat serviceable aircraft. Modernization continues with more modern aircraft coming into the Reserve. For the first time in history, units of the Naval Air Reserve have developed measurable combat readiness together with a 30-day response time.

Marine Corps Reserve.—The 4th Marine Amphibious Force is capable of mobilizing and deploying within 60 days after alert. Modernization programs continue—particularly in aviation units.

Air Guard and Reserve.—Although combat readiness rating statistics for the Air National Guard and Air Force Reserve show fewer units ready than in past years as a result of ongoing conversions, the potential gains in over-all capability, which are being achieved through modernization, more than offset the temporary loss if readiness incident to mission and aircraft conversions. Modernization has eliminated the C–119s, F–84s, F–86s, with C–130s, C–141s, F–100s, F–105s, and RF–4s replacing them.

Forecast

The major constraint to readiness has been equipment. With this constraint being resolved—but we must keep the momentum going—we must concentrate: (1) on training—training which could not be properly accomplished for lack of equipment to train on; (2) on facilities and construction to assure priority for those projects which will most improve readiness; (3) on acquisition of adequate weekend training areas for maneuver units; (4) on reducing the post-mobilization training and administration times for Army units to meet NATO contingency deployment schedules; (5) on emphasizing recruiting and retention in a zero draft environment; (6) on new initiatives, new concepts to mold men, money and material into Selected Reserves that are a realistic deterrent; (7) on realistic and challenging training in conjunction with Active forces wherever feasible; and other measures which will improve combat readiness.

Based on the progress made since fiscal 1969, I believe that the total force objectives for national security as presently established can be met by using the Guard and Reserve, provided that we continue to make headway as we have since then. It won't be easy, but it can be done. It will require continued equipment momentum, manning support, intensive Command interest in training, and judicious adjustment in structure.

Reserve Deployment Schedule

Senator Thurmond. We hear so much about the readiness problems of the Reserve and Guard, are we being realistic to expect Guard and Reserve divisions, receiving only five percent of the Defense budget, to be able to deploy on a schedule not much slower than a regular Army division?

Secretary Laird. We must keep in mind that the trend in readiness is upward whether we allow readiness objectives will depend ultimately on the degree of support provided them—particularly the support of the Congress and the Army Staff.

I want to be very careful not to degrade the importance of dependence on the Active Army to meet the bulk of early deployment requirements. I am not, however, convinced that it takes a great deal more time to get people back from leave, schools and other pipeline absences than it takes to mobilize a manned, equipped and trained Guard or Reserve unit.

I have confidence that the Army will make every effort to meet the NATO mobilization objectives set for all Army components—active duty and non-active duty. It is not going to be easy. It will require adjustments in thinking, a lot of hard work will be required, and there has to be a marked improvement in training.

As to the exact number of dollars or percentages beyond FY 1973, ingenuity in training and the level of command emphasis will be the major factors in the degree of success and economy attained.

At this point, I would like to see us attain present NATO deployment and readiness objectives as economically as possible and with a minimum of personnel turbulence.

Senator Thurmond. If this can be accomplished, then do you feel we could greatly reduce defense costs?

Secretary Laird. I do not believe we can make dramatic reductions in the cost of the Active Army, other than those which come about as a result of reductions from Vietnam force levels or as offsets to the cost of developing genuine readiness in the Guard and Reserve. Once the Guard and Reserve have demonstrated their ability to absorb and effectively utilize the equipment and other support being given them in the production of usable combat readiness, we will have a better answer to this question. However, it should be noted that approximately 45% of Army strength is already programmed to be in the Guard and Reserve by FY 1974. I personally believe we should take care to get this 45% ready, streamline the logistical tail, adequately equip the force on the basis of priority of deployment, and reduce the administrative and logistical problems of mobilization and deployment.

NATO Requirement For Reserves

Senator Thurmond. Can the Guard and Reserve meet 35 percent of the NATO requirement with only five percent of the Defense budget?

Secretary Laird. At the present time, that part of the NATO requirement assigned to the Guard and Reserve can be met *only* through *use* of the Guard and Reserve. These components are far better able to meet it—on the basis of equipment alone—than they were three years, or even one year ago. The availability of equipment as a result of reductions in U.S. force levels in Vietnam, and the increased impetus and assistance which are now evident in active units and headquarters, are just as important for progress as the dollars which are budgeted for Guard/Reserve support.

I believe it is important to recognize that the five percent of the Defense budget to which you referred supports each Service's development of Guard and Reserve readines to meet more than one type of contingency—not just the portion of their mission which is concerned with NATO. The funding levels we have proposed for FY 1973 represent a balanced program which will enable us to continue the momentum of our effort to recover from the low levels of readiness which existed prior to 1969. Although funding is only one element of the support required, it is logical to assume that a lower level of support than that programmed would prolong the period required for attainment of readiness objectives and, conversely, a more rapid rate of progress would be possible with higher funding levels.

High State of Readiness Goal

Senator Thurmond. Some Air Reserve and Guard units can achieve a high state of readiness because they are more hardware oriented. However, Guard forces requiring large numbers of men are different. Could they ever attain the state of readiness which a hardware unit can achieve?

Secretary Laird. There is no reason I can see why any type of Guard or Reserve unit which is properly supported and trained cannot match the high state of readiness which has been attained by the Air Reserve Components. There are a number of units in the Army Guard and Reserve which have demonstrated their ability to achieve and maintain company and battalion level units, and the experience of the Marine Corps Reserve supports that point.

Lift Capability of Reserves

Senator Thurmond. Would you comment on the emphasis being put on Reserve readiness in relation to our airlift and sealift capabilities. Should the size of our Reserve forces be tailored to the "weakest link," presumably lift capability, in the Reserve equation?

Secretary Laird. Use of the Reserve Components for part of the forces needed to deal with NATO conflict offers significant economic advantages. Taking the capabilities of our allies into full account, we have concluded that 13 Active Army divisions and 3 Active Marine divisions represent the peacetime "baseline" forcce necessary to support national objectives during FY 1973. To counter a major conflict such as could occur in NATO Europe, we would rely upon a ready Reserve Component force of 9 more divisions (8 Army, 1 Marine Corps) to reinforce our Active forces.

In response to your specific question about whether the size of our Reserve forces should be tailored to the "weakest link," presumably lift capability, there are scenarios where total lift capability would fall short of requirements, even though current plans include utilizing significant amounts of lift to be provided by the Civil Reserve Air Fleet and vessels of U.S. and allied commercial shiplines. Reducing the size of the Reserve Components would be a case of adjusting "requirements" to meet resources rather than providing the means of satisfying needs. We would, in effect, be reducing the credibility of our total force, making our deterrent less realistic, weakening our total military strategy, and consequently our National Security Strategy of Realistic Deterrence.

Reserve Deployment Study

Senator Thurmond. A study of the Reserves' components was conducted that was amied at reducing the time between mobilization and deployment during the next few years. What are some of the concepts that this study has identified and how soon do you think they can be implemented?

Secretary LAIRD. The Services' responses to the OSD Reserve Component Study indicated a general willingness to test recommendations of the Study, to adopt some without testing, and that some were already implemented.

For the Navy, the recommendations specifically listed were largely either ongoing programs or in process of implementation within the present fiscal guidance. Some of the concepts require much greater in-depth study with regard to both feasibility and/or fiscal suitability; e.g., coastal towing, amphibious lift, underway replenishment, search and rescue units, utility squadrons, and CONUS-based Fleet tactical support squadrons.

The Air Force also indicated that several of the concepts are included in current planning directives and are agreed upon by the Air Staff. The current Active/Guard/Reserve force mix is a result of specific mission requirements and previous study efforts. However, 22 of the 32 concepts recommended were recognized as having merit for further consideration for the Air National Guard and Air Force Reserve. Examples are dispersal base operation, restructuring of tactical airlift capability, and a total force wing based on the assignment of Guard or Reserve squadrons to an Active Air Force wing.

Perhaps the area of greatest challenge and innovation, as a result of the Study, is in the Army Reserve Components. Army identified and scheduled 21 of 33 proposals for further evaluation and testing. Plans have been made for CONARC to evaluate and test 11 of the concepts while the Army General Staff will evaluate the remainder.

Of the 11 concepts to be evaluated and field tested during 1972 and annual training in 1973, 6 involve reduction in post-mobilization training and deployment time, 3 the roundout of Active units, and 2 the augmentation of Active units by Reserve component personnel. Some of the more innovative concepts are:

Flexible movement to mobilization station—we want to investigate measures that can be taken to minimize the time required to move to mobilization station by changing the mix of air, road and rail transport used. First U.S. Army will test this approach during annual training in 1972 and 1973.

Consolidated post-mobilization training—the aim is to determine whether Reserve Component divisions will be capable of performing assigned missions if post mobilization training time is reduced from 10 to 6 weeks. The 30th Infantry Division (Mechanized) will conduct tests during annual training in 1972 and 1973.

Medium Hybrid Division-Battalion Roundout—the objective is to see whether an Active Army division (8 maneuver battalions), rounded out with 3 Reserve Component battalions, will be capable of performing its mission after two-weeks of post-mobilization brigade and division training.

Heavy Hybrid Division-Company Augmentation—this concept will be tested by an Active Army brigade augmented with a fourth maneuver company in each battalion to determine if the brigade will be capable of successfully completing a brigade level test without additional post-mobilization training, and if the division base is capable of supporting the larger organization.

RESERVE DRAFT POSSIBILITY

Senator THURMOND. There have been several reports in the press that legislation may be required for drafting men into the Guard and Reserve. Please comment on these reports and how such a plan would be immplemented. Tell us just exactly what are the problems in the current enlistment and reenlistment areas relating to the Reserve and National Guard?

Secretary LAIRD. I consider induction authority to be a last resort, an alternative that would be used only if absolutely essential after failure of all other recruiting incentives. Despite the current shortfall of 52,000 in the Guard and Reserve, we do not consider a draft for the Reserve Forces necessary at this time. We would like to avoid such a procedure because of the inequity which on the surface appears unavoidable. We would prefer incentives tailored to needs.

If we decide that a draft for the Guard and Reserve is necessary, induction authority would have to be provided by the Congress. If this authority were obtained and if it were determined that Selected Reserve requirements could not be met through voluntary enlistments and that induction for the Reserves were necessary in the interests of National Defense, the Director of Selective Service could be requested to induct a specified number of persons for service in Reserve units at particular locations.

It has been envisioned that use of an induction authority would involve the use of random sequence numbers (lottery numbers) for selection of individuals for

induction within specific geographical areas where Reserve units with personnel requirements are located. The normal residence of an individual would be an important factor in determining induction liability. Example: A requirement for 100 men for induction into units of the District of Columbia National Guard, for example, would be filled by induction of registrants residing within the District of Columbia, but it could not be filled by induction of persons residing in Ohio or any other similarly distant location.

In summary, only if adequate incentives are not obtained will we be forced to address this possibility.

Man-Year Strength Goal Attainment

Senator Thurmond. If the shortfall in the Guard and Reserve strength continues, how can you expect to meet the Fiscal Year 1973 beginning and average man-year strengths?

Secretary Laird. Although we do not expect to meet the average strength for FY 1972, the Guard and Reserves Chiefs hope to meet the programmed end strengths for FY 1972—which are also the beginning strengths programmed for FY 1973. Factors which will affect this situation include the extent to which the draft is used, the effectiveness of retention and recruiting efforts and the impact of recent pay raises. Field contacts indicate that the impact of "early out" programs—especially the more generous short term impact of the Army's one year early release—will influence near term figures appreciably.

Senator Thurmond. If the recruiting problems continue in the Reserve Components have you any plans at this time to reduce the strength requirements to be commensurate with your ability to obtain manpower?

Secretary Laird. Not at this time. This would be tantamount to adjusting "requirements" to resources, and this approach does not appear to be the right way to meet the threat. The logical approach is to adjust strengths—active and reserve—to the most economical mix which will support the requirements of national security. After this determination and its evaluation by Congress I would assume that American patriotism and American ingenuity (including the use of incentives as needed) will provide the relatively inexpensive manning which may be required.

Incentives for Recruitment

Senator Thurmond. Should it become obvious that the available incentives will not attract sufficient volunteers for the Reserve components, what incentive would you recommend and with what degree of assurance would such incentives solve the manpower problems?

Secretary Laird. Initially it appears that the most effective incentive will be the variable enlistment bonus and a selective reenlistment bonus. Full-time Servicemen's Group Life Insurance coverage for Guardsmen and Reservists and the additional medical, dental and death benefits which would be provided by S. 806 would also help a great deal. Any assurances that I might offer regarding the effectiveness of such additional incentives would have to be tempered by other considerations. For example, since Guardsmen and Reservists derive their primary income from other sources, the trends in national and regional economies will have an effect which is hard to predict, on our recruiting and retention programs. Other factors which are difficult to measure are the changes which may take place in the national and regional attitudes toward military service. There are also indications, which we are attempting to measure, that Guardsmen and Reservists are presently extending, reenlisting, or enlisting for one year in anticipation of the reenlistment bonus being authorized. If this is true, and adequate incentives are not authorized, the loss of these members could affect our strengths in FY 1973.

Strength Goals

Senator Thurmond. What is the rationale of the Army in setting the manning rates of its Guard and Reserve units at 93 percent before deploying to a combat area?

Secretary Laird. The full TO&E of the force developed by the Army for the Army Guard and Reserve is 711,000. The current Congressional mandated paid drill strength of the Army Guard and Reserve is 660,000, or approximately 93% of full TO&E requirements. The Army has used 92% of full TO&E as a strength level at which a unit can fight for a protracted period after initial contact. Since Guard and Reserve units are designed for timely deployment we can accept this level as economical during a period when equipment requirements have not yet been completely met.

Pay Increase Effect on Retention and Recruitment

Senator Thurmond. To what extent have the pay increases which have become effective over the past several months materially assisted in recruitment or retention of members of the Guard and Reserve?

Secretary Laird. At this point in time we do not yet have sufficient information to reach a firm conclusion about the effect of the recent pay raises on recruiting and retention of Guard and Reserve personnel. However, we believe that if we did not have the pay raises, the aggressive recruiting programs and a remnant of draft pressure, we could have even worse a shortfall than the current 52,000 shortfall. We intend to further evaluate the impact of this recruiting effort and compensation increases before asking for additional incentives. We should know our needs in this area by April 1, 1972.

Civilian Employers Cooperation With Reserve Program

Senator Thurmond. What programs are now underway or planned for working with civilian employers stressing the obligation of Guardsmen and Reservist in their employ?

Secretary Laird. The problem of employer attitudes toward employees and prospective employees who are or would like to be members of the National Guard and Reserve is one of our major concerns. We have just completed a study of employment and personnel policies of representative firms, both large and small. We have also obtained the advice of an Ad Hoc Communications Group composed of enlisted personnel and junior officers of the Guard and Reserve.

After these efforts, we believe that the most promising avenue for pursuit of a solution is an intensive effort to communicate to members of the business and industrial community the need for the Guard and Reserve, the national economies which can be attained through making these components real and effective elements of the Total Force, and their contributions to local communities. Toward this end we are emphasizing in policy statements, speeches and letters to public officials, the need for recognition and support of the contribution to national security made by Guardsmen and Reservists. We are also establishing liaison at national level with major business associations such as the National Alliance of Businessmen and encouraging local commanders to solidify this liaison at community level.

We believe that a major part of this educational effort is composed of demonstrations of combat capability and community concern by Guard and Reserve units throughout the nation in order that the value of these units will help to create a climate in which employers will hopefully be more sympathetic with the desires of their employees to serve the Nation and more supportive of efforts to enhance the Nation's security.

Incentive Devices for Recruitment

Senator Thurmond. What further support or tools will be needed to attract the men and provide the other backing to accomplish this task?

Secretary Laird. In addition to the enlistment and re-enlistment bonus there are two other incentive devices which are foremost in our consideration. One is the authorization of certain medical, dental, and other benefits which would lessen the inequity in treatment currently existing. Legislation to accomplish this has been introduced in S. 806. The other is the extension of full-time Servicemen's Group Life Insurance to Reservists.

Educational, retirement, travel and other incentives have also been considered. As we have studied this problem, we have requested assistance from the Reserve Officers Association, National Guard Association of the U.S. Reserve Forces Policy Board, several ad hoc groups and many other Reservist's in addition to the Services and most of our advice has emphasized the items listed. In addition, a number of Governors have given priority to these items in letters to the Secretary.

Reserve Component Strength

Senator Thurmond. For the record the Committee would like the number of people in each of the Reserve Components in addition to the number being requested for the Selected Reserve which only constitute a portion of our Reserve strength.

Secretary Laird. I will include in the record a table showing the actual strength available in all categories, including the Selected Reserve, as of December 31, 1971.

(The information follows:)

AVAILABILITY OF RESERVE FORCES BY CATEGORY

34 CATEGORY		CITE	AVAILABILITY
Ready Reserve			
o Selected Reserve			
ARNG	380,742	§673, 10 USC	Not more than 1,000,000 members of the Ready Reserve may be on active duty (other than for training) without their consent. These men may be ordered to active duty in time of national emergency declared by the President, or when otherwise authorized by law, for not more than 24 consecutive months.
USAR	249,351		
USNR	120,651		
USMCR	42,354		
ANG	87,215		
USAFR	47,196		
o IRR			
USAR	970,277	§673, 10 USC	
USNR	372,335		
USMCR	128,098		
USAFR	199,534		
Standby Reserve			Members of the Standby Reserve may be ordered to active duty (other than for training) Only in time of war, of national emergency declared by Congress, or when otherwise authorized by law. A member of the Standby Reserve may be ordered to active duty for the duration of the war or emergency and for six months thereafter. A member of the Standby Reserve may not be ordered to active duty unless determined to be available by the Director of Selective Service.
USAR	446,735	§672, 673, 674, 10 USC	
USNR	58,532		
USMCR	81,964		
USAFR	68,688		
Retired Reserve			
USAR	319,793	§672, 10 USC	A member in the Retired Reserve may, if qualified, be ordered to active duty without his consent in time of war or national emergency declared by Congress, or when otherwise authorized by law.... A member on an inactive status list or in a retired status may not be ordered to active duty...unless the Secretary concerned, with the approval of the Secretary of Defense...determines that there are not enough qualified Reserves in an active status or in the inactive National Guard in the required category who are readily available.
USNR	106,942		
USMCR	10,885		
USAFR	203,492		

Note: All data as of Dec. 31, 1971

MOTIVATION OF NON-PRIOR-SERVICE PERSONNEL

Senator THURMOND. Provide a detailed breakout for the record of the number of non-prior service personnel that the Reserves are attracting who are not draft motivated. How does your present level of attraction of non-prior-service personnel who are not draft moviated compare with April, May, June and July of last year?

Secretary LAIRD. Sufficient data is not currently available for an accurate determination of the number of non-draft motivated, non-prior service personnel joining the Guard and Reserve Forces. The most meaningful answers I can provide have to be based on data available for the Army National Guard (ARNG).

Our best indication of draft motivation is provided through analysis of Random Selection Numbers (RSN's) for those personnel enlisting in the Reserve Components who are old enough to have these numbers. Line "C" on the attached chart titled "Non-prior Service Accessions in the Army National Guard for CY 1971" suggests that there was no increase in the total numbers of non-draft motivated, non-prior service personnel with recorded RSN's joining the ARNG during the last quarter of 1971 as compared with the period April through July of 1971. These figures do not necessarily mean that increased recruiting efforts in the latter months of 1971 were ineffective, however. We anticipate that increases in enlistments of non-draft motivated, non-prior-service personnel will most likely occur first among those men 17 and 18 years of age.

Unfortunately we have no precise way of measuring draft motivation among 17 nd 18 year olds since men of this age group do not have Random Selection Numbers. While line "a" on this attached chart shows an increase in monthly non-prior service accessions in the Army Guard commencing with September, this increase may be due in large measure to the August 5 lottery drawing, extension of the draft law, and to the September 30 announcement of a 10,000 man draft call for the period October through December 1971.

(The information follows:)

NON PRIOR SERVICE (NPS) ACCESSIONS

IN THE ARMY NATIONAL GUARD FOR CY 1971

1971	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
a. TOTAL NPS ACCESSIONS	3,726	4,390	7,154	5,746	5,987	5,057	4,650	3,746	4,848	6,006	6,170	4,677	62,157
b. TOTAL NPS ACCESSIONS WITH RECORDED RSN's[1]	3,174	3,642	5,568	4,175	4,297	3,695	3,229	2,603	2,190	2,438	2,097	1,510	38,618
c. NPS ACCESSIONS WITH RANDOM SELECTION NUMBERS ASSUMED NOT TO BE DRAFT MOTIVATED[2]	318	297	516	366	345	270	378	309	252	270	330	288	3,939

NOTE #1: Random Selection Numbers are available only for male personnel born in the years 1944 through 1951 during this period (CY 1971).

NOTE #2: In determining draft motivation among ARNG enlistees with Random Selection Numbers it is assumed that all personnel with numbers in Call Groupings 7 through 9 (RSN's 241-366) are non-draft motivated, and that an equivalent percentage of non-draft motivated personnel exists also in Call Groups 1 through 6.

Effect of Discharge Program or Strength Levels

Senator Thurmond. How many discharged two-year active duty draftees are presently being used to fill our Reserve units? How long will this continue? If and when it is discontinued, how will this affect the Reserve manning problem? Why do you want, presumably, a bulkfill, "Early Out" group which is of limited use to the Reserve units since they would not go on annual training and you would have them only for a short time? How will use of these "Early Out" personnel make your Reserve recruiting picture look in the next few months?

Secretary Laird. Draftees who have been discharged after completing two years of active duty are not involuntarily being assigned to Reserve drill pay units. The authority exists whereby men who have not served for a period of 30 days or more in a combat zone or been wounded in action could be so assigned, under certain conditions, but I am not aware of any instances where it is being done.

The above categories of men, including Vietnam veterans, are subject to the provisions of Title 10, U.S.C., section 270 which requires Reservists in the Individual Ready Reserve Pool to serve on active duty for training for not more than 30 days annually until such time as they have completed their statutory obligation. The Department of Defense has relaxed the requirement by not ordering Vietnam veterans to annual active duty during either the year of their release from active duty or during their last year of contractual obligation. In addition, the Services are permitting these men to satisfy their annual active duty for training by serving only 15 instead of the 30 days authorized.

The number of men annually selected for this type of training, by the Army, is approximately 40,000.

The primary purpose for initiating the early out program was to reduce the personnel strength of the active Army to the level mandated by the Congress in the FY 1972 manpower ceilings. Early outs were granted on the basis of an agreement to particpiate actively in the Selected Reserve for one year—a voluntary rather than a mandatory participation. The early release program was terminated February 21, 1972, expect for a limited number of 60-day reductions in terms of active duty, since the program objective had been achieved.

It is generally accepted that there is real value in having these veterans with recent experience to improve the training of Guard/Reserve members. Such training also reinforces the skill of these veterans who are an invaluable mobilization asset. There is also some indication that this association with the Guard/Reserve may lead to the veteran's developing interest in continuing active participation and become a careerist in the Guard or Reserve.

Need for Further Incentives To Meet Manning Levels

Senator Thurmond. Would you comment on the "wait and see" attitude that is taking place during the first quarter of this calendar year toward the manning of the Reserve Forces? Do you feel it is necessary at this time to pursue additional incentives for the Reserve? Hasn't the trend for the past seven months indicated, notwithstanding the sizeable pay increases last November and January and the increased recruiting, that the Reserves cannot survive in a zero draft environment without additional incentives?

Secretary Laird. It certainly appears to me that further incentives will be required if we are to assure that manning levels are met in the future.

Effect of Draft on Enlistments in Reserves

Senator Thurmond. Is it true that the draft is still continuing to have an effect on Reserve enlistments? Take the last quarter of Calendar Year 1971, on the basis of analysis of lottery numbers it could reasonably be determined as to who is draft motivated and who is not. Admittedly, there is a "Gray Area" there. If you assume that a certain percentage of people who volunteer for the Reserves with very low draft numbers are non-draft motivated and that this distribution obtains throughout a lottery population, then you can get a reasonable estimate of how many Reserve enlistments continue to be draft motivated. Please provide this kind of analysis for the record.

Secretary LAIRD. While there is considerably less draft motivation for joining the Guard and Reserve Forces today than at any time during the past several years, the draft appears to exert influence on those non-prior-service personnel currently enlisting in the Guard and Reserves. Analysis of the statistics for the Army National Guard best illustrate these points.

The reduction in Army Guard waiting lists over the last two years clearly shows the decline in draft pressure.

ARNG waiting list

[In thousands]

Quarter ending—	
Dec. 31, 1969	100.6
Dec. 31, 1970	61.6
Mar. 31, 1971	55.7
June 30, 1971	33.0
Sept. 30, 1971	16.0
Dec. 31, 1971	5.0

Of the 38,618 no-prior service men with recorded Random Selection Numbers enlisting in the Army National Guard during 1971, 34,679 or 90 percent were considered to be draft motivated by analysis of their random Selection Numbers.

It is more difficult to determine the draft motivation among the 23,539 non-prior service personnel who joined the Army National Guard during 1971 without recorded Random Selection Numbers. However, one indicator of draft motivation among these personnel is that the monthly average of such enlistments in the Army Guard jumped from 1,143 in August when there was no draft to an average of 3,820 a month during October and November, after the reinstated draft law had come into force, a lottery drawing had been conducted for 1972, and a 10,000 man draft call announced for the last quarter of 1971.

If one were to assume that all of the 1,143 non-prior service personnel without Random Selection Numbers enlisted in August of 1971 were non-draft motivated, and that this was an average for all 12 months in 1971, then up to 13,716 of such enlistments during the year might be non-draft motivated. Adding to this 13,716 the 3,939 non-draft motivated enlistees with Random Selection Numbers, the maximum non-draft motivated figure could be 17,655 or 28 per cent of the total 62,157 non-prior-service personnel enlisted by the Army Guard during 1971.

SIX-YEAR ENLISTMENT CONTRACT

Senator THURMOND. Do you foresee any problems with the present six-year enlistment contract that might require you to shorten the period that a man would be required to spend in the Selected Reserve, that is, a drilling status? Is it possible or feasible to reduce the drilling period obligation to make it more attractive to a potential Reservist?

Secretary LAIRD. Shortening the initial term of enlistment obviously presents one option which we are considering. Certainly we are not ruling out any options at this time. It may well be that shorter enlistments will eventually be required to attract a significant number of non-prior service individuals. However, this does not seem to be a desirable approach because of its extensive effect on costs and training facilities. A reduction from the six-year term to a three-year term, for example, would not only markedly increase training costs but would also hamper the attainment of unit readiness by creating turbulence and lessening personnel stability.

Adjustment of the drilling period downward appeals to some people and discourages others. The length of drilling periods for a given unit should be that number of hours needed to attain programed readiness. Certainly the Services should continually evaluate this significant point.

SCHEDULE ON ARMY RESERVE EQUIPMENT

Senator THURMOND. What is your current forecast as to when the Army Reserve components will have modern equipment on hand to satisfy training requirements?

Secretary LAIRD. The current equipment objective is to issue Level 3 (80–100% of selected items of the G/H series TOE) to Reserve Component units for pre-

mobilization training. The balance of the equipment required for deployment would be located in the depot system ready for issue upon mobilization. As a result of an on-going Logistic Improvement Program, all early mission units are projected to reach Level 3 in FY 1973 while the rest of the NATO oriented major Reserve Component units will reach this level in FY 1974.

The remaining general purpose forces for other contingencies will reach Level 3 by the end of FY 1974.

RESERVE COMPONENT FUNDING

Senator THURMOND. Provide for the record a breakout of funds by appropriation for each Reserve Component for both fiscal years 1972 and 1973.

Secretary LAIRD. I will include tables in the record.

(The information follows:)

FY 1972 (ADJUSTED) RESERVE COMPONENTS PRESIDENT'S BUDGET
($ Millions)

COMPONENT	Personnel[1]	O&M	Construction	Subtotal	Procurement[3]	TOTAL
Army National Guard	$ 596.9	$ 380.0	$29.0	$1,005.9	$206.2	$1,212.1
Army Reserve	447.9	166.9	33.5	648.3	45.4	693.7
Naval Reserve	191.0	118.5	10.9	320.4	1.6	322.0
Marine Corps Reserve	68.8	8.5	[2]	77.3	16.4	93.7
Air National Guard	149.6	424.5	10.6	584.7	34.4	619.1
Air Force Reserve	98.7	172.0	6.6	277.3	9.2	286.5
TOTAL	$1,552.9	$1,270.4	$90.6	$2,913.9	$313.2	$3,227.1
						239.9[4]
GRAND TOTAL						$3,467.0 ($3.5B)

1/ Does not include Active personnel support for Reserve Components.
2/ Included in Naval Reserve budget.
3/ Distribution of procured equipment is accomplished by separate schedule and extends over several years.
4/ Active personnel support for Reserve Components.

SOURCE: FY 73 President's Budget

FY 1973 RESERVE COMPONENTS PRESIDENT'S BUDGET
($ Millions)

COMPONENT	Personnel[1]	O&M	Construction	Subtotal	Procurement[3]	TOTAL
Army National Guard	$ 616.3	$ 468.2	$ 40.0	$1,124.5	$231.7	$1,356.2
Army Reserve	501.8	208.9	38.2	748.9	195.5	944.4
Naval Reserve	216.5	136.0	16.0	368.5	9.1	377.6
Marine Corps Reserve	74.2	8.1	[2]	82.3	26.0	108.3
Air National Guard	169.2	462.0	10.6	641.8	36.7	678.5
Air Force Reserve	115.7	189.9	7.0	312.6	15.6	328.2
TOTAL	$1,693.7	$1,473.1	$111.8	$3,278.6	$514.6	$3,793.2
						256.9[4]
GRAND TOTAL						$4,050.1 ($4.1B)

1/ Does not include Active personnel support for Reserve Components.
2/ Included in Naval Reserve budget.
3/ Distribution of procured equipment is accomplished by separate schedule and extends over several years.
4/ Active personnel support for Reserve Components.

SOURCE: FY 73 President's Budget

Increases for Reserve Components

Senator Thurmond. In light of the increased reliance on the National Guard and Reserve by the Department of Defense, I am certain that there has been an increase in funding for the Reserve Components.

Tell us what these increases are and provide for the record a complete breakdown as to how they will be utilized.

Secretary Laird. I will include in the record a table showing the increase in Guard and Reserve funds since 1969.

(The information follows:)

GUARD/RESERVE BUDGET AUTHORITY

[Dollars in billions]

	1968	1969	1970	1971	1972	1973
Guard/Reserve	$2.2	$2.1	$2.5	$2.7	[1] $3.5	$4.1
Total DOD	76.4	78.1	76.3	72.9	77.1	83.4
Percent Guard/Reserve of total	2.9	2.7	3.3	3.7	4.5	4.9
Percent increase to fiscal year 1973	86	95	64	52	17	

[1] Fiscal year 1972 budget request prior to adjustments for pay costs was $3,100,000,000, making the increase in requested amount some 32 percent.

SIGNIFICANT INCREASES—FISCAL YEAR 1973

	Fiscal year 1972	Fiscal year 1973	Increase
Operations and maintenance	$1.270	$1.473	$0.203
Procurement	.313	.515	.202
Construction	.091	.112	.021
Reserve personnel	1.553	1.694	.141
Active personnel (support)	.240	.257	.017
Total	3.467	4.051	.584

Limitation on Weapons for Reserves

Senator Thurmond. What major line items or weapons system exist in the Army that will not be issued to the Reserve Components?

Provide the reasoning why such items are not programmed for the Reserve.

Secretary Laird. Low altitude air defense and missile weapon systems (TOW, Dragon, Redeye, Shillelagh and Chapperal-Vulcan) have not been issued to the Army Reserve Components. This is because of active Army requirements and limited resources over the past four years. However, the initial issue of weapons systems to the Guard/Reserve is scheduled to begin in FY 73. This particular type of equipment will move very slowly according to present programming.

Problems Facing Reserve Mission Attainment

Senator Thurmond. You indicate in regard to Reserve forces missions that a tremendous effort has been and is being expended to insure that we meet the demands of assigned missions, and significant gains in overall capability have resulted from the influx of equipment alone. What is the main inhibiting factor that is keeping the Reserves from meeting their assigned missions? What is the prognosis for success in this area and in what time period?

Secretary Laird. In 1969 our greatest problem was equipment and we had no problem in meeting requirements for personnel, the decreasing pressure of the draft has caused a change in priorities. The equipment situation is improving rapidly, but movement toward a volunteer force has highlighted the need for incentives and new initiatives which will insure our ability to meet strength requirements in the future.

This does not change the fact that the lack of equipment in numbers and quality suitable for performance of the mobilization mission is still a major factor limiting the attainment of required readiness levels in the Army Guard and Reserve and in certain units of the other components.

The current equipment objective for the Army Reserve Components is to issue Level 3 (80–100% of selected items of the G/H series TOE) to Reserve Component units for pre-mobilization training. As a result of an on-going Logistic Improvement Program, all early mission units are projected to reach Level 3 in FY 1972 while the rest of the NATO-oriented major Reserve Component units will reach this level by the end of FY 1973. The remaining special purpose forces for other contingencies will reach Level 3 by the end of FY 1974.

The extensive modernization programs in the Air National Guard and Air Force Reserve have also placed limitations on combat readiness. These limitations are temporary and will be alleviated when the transition process is completed.

Finally, all training programs of all services warrant a continuing improvement effort until the needed readiness is attained.

Reductions in Air Defense

Senator Thurmond. Secretary Laird, on page 126 of your statement you declare, "Our air defense systems have not in the past been able to meet all of the objectives assigned to them." You state further, "Because of this vulnerability and the reduced effectiveness of parts of our present air defense forces, we have decided to make some selected reductions in the current force levels accepting some additional risks . . .". Mr. Secretary, I find this logic difficult to understand. Why, when we have a relatively deficient air defense force structure, do we make additional reductions rather than improve the existing defenses?

Secretary Laird. We are making these additional reductions because, in simple terms, the marginal benefits provided by these forces are not worth the relatively large costs involved in keeping them. We do not have available for procurement today the necessary hardware to improve our forces at a reasonable cost. Our FY 1973 budget provides for continuing development of components—such as AWACS and OTH radar—which are necessary for such improvements.

Role of Reserve Components

Senator Thurmond. Mr. Secretary, I recognize you are placing increasing emphasis on the reserve and national guard. Is this based primarily on cost considerations, or do you feel they can make up for the reductions in the active force establishment?

Secretary Laird. In actual fact, the answer is both.

If there were no cost considerations whatsoever for the DoD—no fiscal constraints—it might be possible to structure our active armed forces to meet all possible contingencies, and there would be little if any need for ready reserves. However, this approach is not consistent with economic and fiscal realities. We therefore must look to a mix of active and reserve forces to meet the needs of national security.

On the other hand, I certainly would not advocate placing greater reliance on the National Guard and Reserve if I did not believe firmly that they can develop the high state of readiness and the degree of timely responsiveness which is required under the Total Force Concept. Where adequate levels of support have been provided to certain reserve units in the past, the units in question have attained readiness levels and response times consistent with responsibilities assigned to them. A good example is found in the Air Guard F–100 units which were mobilized in 1968 and used in Vietnam, proving their ability to deploy with minimum turbulence and rapidly—in a matter of days—and to become fully operational units of the combat force.

It will take much effort and somewhat higher than normal levels of support to overcome deficiencies in equipment and training which have existed because of a lack of support of some units, particularly in the Army Reserve Components. Our FY 1973 budget, however, is moving in the proper direction.

Readiness of Reserve Components

Senator Thurmond. Secretary Laird, reserve and guard ground forces do not have the capability to accept and store division equipment. How then can they achieve a state of readiness which seems to be required by present policies?

Secretary Laird. We recognize that the increasing flow of equipment to Guard and Reserve ground forces units is creating some problems in storage and maintenance, but we believe that the potential gains far outweight the difficulties. Our attack on this problem is twofold. First, we are improving levels of full-time technician support in order to cope with the complexities and numbers of

new equipment items and to make sure they are used effectively in training. Second, we are conducting a continual review of proposed and already approved construction projects and of the adequacy of available training facilities to insure that all funds are allocated where they will make the greatest contribution to unit readiness. This means that, in some cases, it may be necessary to postpone the construction of programmed armories or training centers and divert the funds from these projects to maintenance shops and hardstands for storage.

In addition to these actions which we are undertaking at Department of Defense and Service level, I am also relying on the ingenuity of the Guard and Reserve leaders who have told us repeatedly that, given the equipment necessary for their mobilization missions, they would produce the readiness required for mission performance.

STRENGTH LEVEL OF ARMED FORCES

Senator THURMOND. What level of regular armed forces in the four services do you envision in the next 5 years?

Secretary LAIRD. Although planning for FY 1974 and subsequent force levels is only tentative, based on our current Five Year Defense Program, which is now being revised, we anticipate total military manpower to remain relatively constant over the next five years.

SENATOR THURMOND'S QUESTION OF ADMIRAL MOORER

Chairman ELLENDER. Senator Thurmond has also prepared some questions for you to answer, Admiral Moorer. I will ask that the answers as well as the questions appear in the record following those addressed to the Secretary.

(The questions and answers follow:)

EUROPEAN TRANSPORTATION RESPONSIBILITY

Senator THURMOND. Admiral Moorer, who has the responsibility to transport the [deleted] Army divisions and [deleted] Marine divisions to Europe by [deleted] days in the event of a NATO war?

Admiral MOORER. The responsibility for transporting [deleted] Army divisions (less the 4⅓ divisions already deployed to Europe) and [deleted] Marine divisions to Europe within [deleted] days of a decision to deploy in the event of a NATO war (with mobilization) would be as follows:

1. TRANSPORT OF ARMY DIVISIONS

(*a*) Air Force, Military Airlift Command (MAC) which would include control and operation of the Civil Reserve Air Fleet (CRAF).

(*b*) Navy, Military Sealift Command (MSC) nucleus fleet including Government Agency Agreements (GAA) with the Maritime Administration for operating ships from the National Defense Reserve Fleet (NDRF) as well as control of mobilized ships of the US merchant marine (including effective US Control (EUSC) ships).

(*c*) Army, Military Traffic Management and Terminal Service (MTMTS) would provide CONUS land resources including operation of mobilized civil rail and road resources.

(*d*) NATO shipping pool would augment US shipping capacity as soon as it could be made available and operable.

2. TRANSPORT OF [DELETED] MARINE AMPHIBIOUS FORCES (MAPS)

(*a*) Navy amphibious lift forces organic to the US fleet.

(*b*) The same services of MAC and MSC as required for Army divisions.

TRANSPORTATION ADEQUACY

Senator THURMOND. Do you feel it is realistic to assume this nation has the means to accomplish the movement of these troops and the equipment they would require?

Admiral MOORER. Yes. With a C–5A force of 70 UE aircraft attained, suitable readiness of Army divisions for deployment, [deleted].

Reserve Division Slice

Senator Thurmond. What percent of this [deleted] division force would consist of reservists and guardsmen?

Admiral Moorer. The [deleted] Army Division force is designed to consist of [deleted] divisions with their initial supporting increments and [deleted] sustaining supporting increments. These non-divisional combat complements include reconnaissance artillery aviation and Service support units and individual replacements which add to the division's firepower and sustainability. This force structure consists of [deleted] men, [deleted] of which are drawn from the reserve components including [deleted] brigades.

Senator Thurmond. Admiral Moorer, do you feel that at the present time, the reserves and guard possess a state of readiness which would permit their deployment to Europe on such a time table?

Admiral Moorer. [Deleted] Reserve component brigades and smaller units have been earmarked, trained and equipped as early mission units and we believe that under optimum conditions we could get them to Europe in the first [deleted] subsequent to mobilization for a NATO conflict. As you know, a NATO contingency would be extremely time-sensitive with regard to a requirement for the rapid buildup of U.S. forces.

[Deleted.]

Readiness of Reserve Components

Senator Thurmond. What is being done to increase the present state of readiness in the Reserve Components?

Admiral Moorer. Readiness improvement of the Army Reserve Components received new impetus on 22 August 1970, when the Secretary of Defense announced that "the Guard and Reserve units will be prepared to be the initial and primary source for augmentation of the active forces in any future emergency requiring a rapid and substantial expansion of the active forces." He directed that the services initiate programs to provide resources and achieve readiness levels based on major contingency plan requirements. Army Reserve Component units have been integrated into the overall master priority list and are receiving support and assistance in accordance with their missions.

[Deleted.]

Manpower.—New initiatives have been undertaken to recruit and retain authorized personnel. Units now have trained recruiters working full time to recruit young men without prior service and a major drive is underway to recruit trained soldiers who are leaving the Active Army but are willing to serve in the Army National Guard or Army Reserves.

Material.—Equipment is being issued as rapidly as it can be assimilated. The Reserve Components received $300 million worth of equipment in FY 1970, $727 million in FY 1971, and should receive $900 million in FY 1972. Technicians, new construction and logistical support have been increased concurrently with equipment issues to enable the Reserve Component units to maintain, safeguard and use the new equipment.

Training.—The Army is acquiring new or improved training sites, engaging in "Mutual Support" and "Round Out" programs between Reserve and Active Army installations and units. Current funding for the Army reflects an increase in percentage of funds earmarked for reserve training.

OSD, JCS and the Services have conducted studies to determine the optimal methods for improving Reserve Components deployability. The studies assumed a NATO deployment scenario and recommended concepts where potential improvements in deployment time might accrue. Test and evaluation of these concepts is to be conducted by Continental Army Command (CONARC) during the next two years. The tests will be geared toward selective unit improvements which would be required in order to better satisfy the force requirements.

New concepts relating to organization, mobilization, training, improved readiness and more rapid deployment have been developed and will be tested and evaluated to insure that only those that provide demonstrable improvement will be proposed for adoption.

Immediate Deployment Readiness

Senator Thurmond. Admiral Moorer, how many Army units are ready today and have been designated for immediate deployment in the event the nation has to commit a force of 2 or 3 divisions?

Admiral Moorer. [Delete.]

Army General Purpose Forces are designed so that the United States will be prepared for an initial defense in all types and sizes of contingencies worldwide. In our force planning, we attempt to build forces to meet all of these possible contingencies, recognizing the practicality that we will not be able to meet multiple contingencies simultaneously. By sizing our forces to meet certain major threats, we expect to be able to handle lesser threats with the same forces. [Deleted.]

Size of VN Rescue Mission

Senator Thurmond. Admiral, on May 1, the U.S. will have approximately 69,000 men remaining in Vietnam. If the Communists mount a big offensive, and these men face unusual danger, what size force is available for a rescue mission?

Admiral Moorer. Forces immediately available to CINCPAC outside of Vietnam for a rescue mission are as follows: [Deleted.] Other forces could be assigned to CINCPAC from assets in the U.S. if the circumstances required.

Base Protection in VN

Senator Thurmond. Admiral Moorer, as we draw down our forces in Vietnam, are any special security measures being taken to protect our air bases and the remaining personnel and aircraft still there?

Admiral Moorer. Yes, COMUSMACV has identified critical installations which include major airfields, POL and ammunition dumps, key communication facilities, logistic complexes major headquarters, ports, and certain other installations which are critical to U.S. operations. Measures being taken to defend these installations are:

[Deleted.]

In early February 1972, General Abrams formed 28 inspection teams of senior and experienced U.S. Officers to review defensive plans of critical installations. These teams visited the critical installations and made an on-the-ground inspection to determine the status of local security and readiness of the responsible unit.

Subcommittee Recess

Chairman Ellender. We will stand in recess until tomorrow at 10 o'clock.

(Whereupon, at 4:30 p.m., Thursday, February 24, the subcommittee was recessed to reconvene at 10 a.m., Friday, February 25.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

FRIDAY, FEBRUARY 25, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Young, Allott, and Case.

DEPARTMENT OF DEFENSE

STATEMENTS OF:
HON. MELVIN R. LAIRD, SECRETARY OF DEFENSE
ADM. THOMAS H. MOORER, U.S. NAVY, CHAIRMAN OF THE JOINT CHIEFS OF STAFF

ACCOMPANIED BY:
HON. ROBERT C. MOOT, ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
RADY A. JOHNSON, ASSISTANT TO THE SECRETARY (LEGISLATIVE AFFAIRS)

STRATEGIC COMMAND AND CONTROL

Chairman ELLENDER. Mr. Secretary, you may continue.

Secretary LAIRD. I would like to begin, Mr. Chairman, by presenting to you the discussion on strategic command and control, on page 123 of my defense report.

As I explained earlier in this chapter we seek reliable, flexible and survivable command and control systems. The growing threat from Soviet strategic forces makes early improvements to our national command and control system imperative. The most critical need is for a survivable, enduring command post. Over the years, we have concluded that the best solution to this problem for the foreseeable future is to go airborne with adequate command, control, and communications facilities on board. Accordingly, we have decided to move ahead and request funds for procurement of new aircraft for this purpose.

AIRBORNE COMMAND AND CONTROL SYSTEMS

Our current airborne command and control system is deficient in that it lacks capacity for added communications and data processing equipment. It also lacks the survivable, secure communications needed for control and execution of the forces, the long endurance, the space for

sufficient high level staff to support the national command authorities, and the space for the battle staff and equipments which provide the information needed in the critical decisionmaking process.

Earliest possible correction of deficiencies is essential. We believe that by moving vigorously now we can greatly improve our command and control posture by early 1975. To achieve this goal, the first steps are to acquire aircraft with the size and endurance needed and to initiate acquisition of the new on-board facilities.

AABNCP Aircraft

To perform the command and control job, a fleet of seven AABNCP aircraft is needed. We requested $119.8 million in our fiscal year 1972 supplemental request to purchase the first Boeing 747 aircraft and related electronics. We propose to purchase two more aircraft in fiscal year 1973 and one additional aircraft in 1974 to achieve early correction of our deficiencies. The initial aircraft will provide some important improvements in our capability by 1973. Three of these first four aircraft will use the existing EC–135 electronic equipment and the fourth will be used for a special electromagnetic pulse test program and as a test bed for the development and operational testing of those new equipments which will be needed. By providing a larger, more capable aircraft, even with the present electronic equipment, we will be able to obtain greater endurance, more flexibility, capacity for larger battle staffs, and additional space to put improved communications and automatic data processing as it becomes available.

Chairman Ellender. How many of the EC–135's do we have?

Secretary Laird. At the present time we have a total of 42 of these aircraft, including 29 assigned to SAC. This will enable us to put these aircraft back into the tanker fleet.

Program Cost and Possibility of Postponement

Chairman Ellender. Mr. Secretary, over the years we have spent a considerable sum on providing various alternate command post installations. The planned force of seven of these advanced airborne command post aircraft will cost in excess of $400 million. I would hope that we could depend on the existing alternate facilities and at least postpone this program, or maybe cancel it.

Secretary Laird. I don't think we should postpone this, because this is one of the cheapest ways to give credibility to our deterrent and the momentum that is going to go along——

Chairman Ellender. To whom will you give this credibility?

Secretary Laird. To our own deterrent forces. In order for us to have a credible deterrent, we have to assure that the command and control function of this Government is operable.

Chairman Ellender. Don't we have this assurance in the existing alternate facilities, on which we have spent many millions?

Secretary Laird. Yes, the Colorado Springs facility and also the other facilities that were authorized while I was on the House Appropriations Committee are good facilities.

Chairman Ellender. I agree with you, they are good facilities—probably the best money can buy. It seems to me that we could rely

on these existing facilities and not go ahead with this very expensive advanced airborne command post at this time. Maybe we should go ahead with the R. & D. effort on the required new electronics and communications equipment.

When you consider the funds in this budget for the acceleration of the ULMS program, the initiation of the new *Nimitz* class carrier, and the continuation of the development of the B–1 bomber you have to face up to the fact that there is going to be substantial opposition to the total budget. It seems to me that programs of this nature, that is the advanced airborne command post, could be deferred.

Secretary LAIRD. I think this means quite a bit, Mr. Chairman, because the survivability of our national command authority is absolutely essential.

Chairman ELLENDER. [Delete.]

Secretary LAIRD. [Delete.]

Now, the survivability of the command and control authority exercised by our Commander in Chief, the President of the United States, is absolutely essential as far as all of these strategic systems are concerned. This command post and the backup aircraft are needed and necessary for it will give the national command authority an opportunity to be airborne for 16 hours without even a refueling.

Chairman ELLENDER. We have that capability now in the EC–135 Aircraft.

INADEQUACY OF PRESENT COMMAND AIRCRAFT

Secretary LAIRD. Mr. Chairman, I would like you to go out and see the command plane standing on alert today at Andrews [delete]. With all of the equipment that is aboard that plane even as you walk down the aisle getting aboard, everyone has to stand up to crowd through. And the quarters back there for the long period of time [delete] are just not adequate.

I have taken flights on that aircraft. The first time I did was with the chairman of the House Appropriations Committee—I think before we had even the 135's—Chairman Mahon. We went up in this aircraft.

With the crowded conditions that exist with all of the equipment and the new improvements that are programed for secure communications and for data processing it is very essential that we go to the 747's.

This is a very small cost for such an important part of our whole strategic deterrent system.

I would like the chairman to comment on this, too, because it is a very important part.

Chairman ELLENDER. Yes, I want to hear what Admiral Moorer has to say on this. Senator Young, I think you had a question.

AIRCRAFT FUELING SPAN

Senator YOUNG. What is the difference between the two planes in the number of airborne hours before refueling?

Secretary LAIRD. As far as the number of hours is concerned I think it goes from 12 to 16 hours without refueling.

Chairman ELLENDER. Admiral Moorer.

AIRCRAFT REPLACEMENT VALUE

Admiral MOORER. First, with respect to the number of 29 aircraft, that includes those aircraft that are used by the Strategic Air Command. Of the aircraft we are addressing here. I envision only a total procurement of seven. Through this process we will be able to replace more than on a one-for-one basis.

[Deleted.]

Chairman ELLENDER. Of course, you have other communications systems.

Admiral MOORER. Yes, sir, we have alternate communications. We are introducing satellite communications, and we would have the same data in the data base in this command control post that we have in the other land-based command systems so that the President would have the information he needs to make decisions, depending upon what the circumstances are at the time.

[Deleted.]

Chairman ELLENDER. They are for the Strategic Air Command?

Admiral MOORER. That is correct, sir.

Chairman ELLENDER. And one will be on standby. All of those are expensive to operate. I am very hopeful that you can postpone some of these expenditures.

Secretary LAIRD. These will replace other aircraft, Mr. Chairman.

Chairman ELLENDER. I understand that. But let us do without it for another year.

Secretary LAIRD. But I wish you would look at these new aircraft. Even with the new configuration this is not going to be a pleasant or plush place to have your national command authority. I can assure you of that.

GREAT EXPENSES FOR SMALL IMPROVEMENTS

Chairman ELLENDER. Well, I looked at my Buick yesterday. It is 5 years old. I need a new Buick. Yet I am going to keep it another year.

This item is only one of a number of requests of which one could be critical.

AWACS SYSTEM

The AWACS is another expensive program that should be carefully reviewed. As I recall, the planned AWACS program will cost about $2.7 billion, and its primary purpose is for the detection of enemy aircraft and it does have a mission relating to tactical aircraft.

I do not believe that current Soviet bomber threat justifies going ahead with a completely new aircraft warning system. We are still operating the DEW line and associated facilities, which seems to be more than adequate to cope with the current Soviet bomber threat to the United States.

It just does not make sense to spend this amount of money to counter the limited number of old Soviet bombers.

Admiral MOORER. Our B–52 bombers are about the same age.

Secretary LAIRD. They will have newer bombers before we will.

Chairman ELLENDER. Yes, if they decide to produce their new bomber, I believe you call it the Backfire. However, it is my understanding that we do not have any evidence that they are producing that aircraft in operational quantities.

I wasn't surprised by their development of the new bomber, because we spent several years and about $1.5 billion on the B–70 before it was terminated because it could not survive the high altitude air defenses of Russia, and then we started on the development of the ASMA, now called the B–1, which is designed for low-level penetration.

Secretary LAIRD. [Deleted.]

Chairman ELLENDER. They did what we should have done in developing prototypes.

Secretary LAIRD. That is what we are doing with the B–1. [Delete].

REACTION TO OTHER COUNTRY DEVELOPMENTS: CONTINUAL ARMS RACE

Chairman ELLENDER. I know. As I said the other day to you—and I am sure you will admit it, Admiral Moorer—anything we develop, we can expect the prospective enemy to counter. We do the same thing. If we continue with this arms race—I am very serious—I fear the effect on our economy, which is in danger now.

Admiral MOORER. I share your concern about the economy, but I do not agree that everything the Soviets have done has been in reaction to what we have done. In other words, if you follow on with that thought, you would come to the conclusion that, if we do nothing, then they will do nothing. This conclusion just isn't borne out by the facts.

REQUIREMENT FOR AWACS

Chairman ELLENDER. I want to repeat that I do not see the need for going ahead with the production of the AWACS system in view of the current threat to the United States of Soviet bombers.

Admiral MOORER. If I may comment on the AWACS, the AWACS certainly has a dual capability in the sense that it is mobile. It can be used for the control of tactical aircraft outside of the United States as well as for defense inside the United States.

Chairman ELLENDER. I am aware of the stated tactical mission of the AWACS system. However, in view of previous testimony before this subcommittee I think it is clear that the primary mission of the AWACS was air defense and this tactical mission is secondary.

PROPER FINANCING BY ALLIES: U.S. PUBLIC DEBT

However, insofar as this may be one of the purposes of the system, it should be financed by our NATO allies.

The time has passed when the United States could afford to proffer largesse over the entire world. Priorities at home and the state of our finances dictate this. The public debt by the end of the Nixon administration's term may well approach half a trillion dollars. It is presently estimated that it will be about $480 billion. The interest on this — just the annual interest — runs over a $22 billion.

As I have said previously, I recall that when I first came to Washington in 1937 President Roosevelt was severely criticized, because he advocated expenditures of $19.5 billion over a two year period for the entire Federal Government. Yet today this amount will not cover the cost of the interest on the public debt for just 1 year.

Admiral MOORER. Yes, sir, I remember those days, Mr. Chairman. I was an ensign in the United States Navy then making $115 a month.

Chairman ELLENDER. Back in World War I I was making $59 a month. I realize conditions are not comparable.

OPPOSITION TO CERTAIN PROGRAMS

I bow to no man in the Senate or elsewhere in my desire to protect our national security. As chairman of this committee I shall do all in my power to maintain a strong and adequate national defense.

However, the Department of Defense is in the process of initiating at this time several programs involving expenditures of large magnitude, including the B–1 bomber, the aircraft carrier and the ULM's program. You may anticipate opposition to some or all of these by Members of the Senate. If the burden of some of these costly programs could be postponed, and if the services would attempt to limit their requests in other areas, the most important items for which you need funds would not be so likely to be attacked.

LARGER COST SHARING BY ALLIES

As a corollary to this, I reiterate, some method must be found to make the free nations of the West realize that it is necessary and in their self-interests to assume a larger share of the cost of their own self-protection.

Secretary Laird, I think, is the only one that has started the ball rolling in that direction, in a very small way.

However, this first billion dollars you got has to be spread over a period of 5 years, and it is to construct facilities on their own land. And this new program you had here recently with the Germans to build these barracks on their own land to house our own soldiers is a help.

But all of these programs we have are big, will be very costly, and if we keep on at this rate of expenditure, I don't know where we will land. We are on our way. Something has to be done to slow it down—not stop it altogether, because we will never be able to do that—but there are some things we can postpone with no danger to our security.

Senator YOUNG. I was going to say, Mr. Chairman, that this policy of trying to police the whole world is being reversed to a considerable extent now, which I think will probably result in lower costs and, I hope, more modern equipment.

Chairman ELLENDER. I hope you are right, but consider the field of foreign aid. I have been opposed to foreign aid since 1952, and have never voted for foreign aid since that time. But foreign aid today is larger than it was when it was started, if you consider the large sums that we are making available to Southeast Asia and to other parts of the world. We simply can't keep that up.

Proceed, Mr. Secretary.

MUTUAL DEFENSE TREATY COMMITMENTS

Secretary LAIRD. I just want to state that we are trying to get away from being the policeman of the world, but we do have certain mutual defense treaty commitments that have been approved by the Senate

in accordance with our constitutional processes. In order to make the record complete, I would like to insert the operative sections of those mutual defense pacts.

(The information follows:)

OPERATIVE SECTIONS OF MUTUAL DEFENSE PACTS (U)

NATO

Article 5 of the North Atlantic Treaty states: "The Parties agree that an armed attack against one or more of them in Europe or North America shall be considered an attack against them all and consequently they agree that, if such an armed attack occurs, each of them, in exercise of the right of individual or collective self-defense recognized by Article 51 of the Charter of the United Nations, will assist the Party or Parties so attacked by taking forthwith, individually and in concert with the other Parties such action as it deems necessary, including the use of armed force, to restore and maintain the security of the North Atlantic Area."

In addition to the United States, Belgium, Canada, Denmark, France, Federal Republic of Germany, Greece, Iceland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Turkey and the United Kingdom are parties to the Treaty.

SEATO

Article 4 of the Southeast Asia Treaty states: "Each Party recognizes that aggression by means of armed attack in the treaty area against any of the Parties or against any State or territory which the Parties by unanimous agreement may hereafter designate, would endanger its own peace and safety, and agrees that it will in that event act to meet the common danger in accordance with its constitutional processes".

In addition to the United States, Australia, France, New Zealand, Pakistan, The Philippines, Thailand and the United Kingdom are parties.

RIO TREATY

Article 3 of the Inter-American Treaty of Reciprocal Assistance states: "The High Contracting Parties agree that an armed attack by any State against an American State shall be considered as an attack against all the American States and, consequently, each one of the said Contracting Parties undertakes to assist in meeting the attack in the exercise of the inherent right of individual or collective self-defense recognized by Article 51 of the Charter of the United Nations."

In addition to the United States, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela are parties to the Treaty.

ANZUS

Articles IV and V of the ANZUS Treaty state:

"IV. Each Party recognizes that an armed attack in the Pacfiic Area on any of the Parties would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional processes. . . ."

"V. For the purpose of Article IV, an armed attack on any of the Parties is deemed to include an armed attack on the metropolitan territory of any of the Parties, or on the island territories under its jurisdiction in the Pacific or on its armed forces, public vessels or aircraft in the Pacific."

In addition to the United States, Australia and New Zealand are parties.

CHINA

Article 5 of the Mutual Defense Treaty with Republic of China states: "Each Party recognizes that an armed attack in the West Pacific Area directed against the territories of either of the Parties would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional processes.

JAPAN

Article V of the Treaty of Cooperation and Security with Japan states: "Each Party recognizes that an armed attack against either party in the territories under the administration of Japan would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional provisions and processes."

KOREA

Article 3 of the Mutual Defense Treaty with Republic of Korea states: "Each Party recognizes that an armed attack in the Pacific area on either of the Parties in territories now under their respective administrative control, or hereafter recognized by one of the Parties as lawfully brought under the administrative control of the other, would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional processes."

THE PHILIPPINES

Article 4 of the Mutual Defense Treaty with the Republic of the Philippines states: "Each Party recognizes that an armed attack in the Pacific Area on either of the Parties would be dangerous to its own peace and safety and declares that it would act to meet the common danger in accordance with its constitutional processes."

AIR DEFENSE FORCES

Secretary LAIRD. Since we have been discussing air defense, Mr. Chairman, let me present to you the discussion of that subject in my Defense report. No changes are planned in the total number of interceptor squadrons, but in keeping with our total force concept, Air National Guard Air Defense forces are programed to assume a greater share of the aerospace defense mission. At the end of fiscal year 1973 they should include four squadrons of F–106's, 10 of F–102's, and 6 of F–101's. The other main force changes planned are reductions in BOMARC surface-to-air missiles, which back up our manned interceptor force, and the backup interceptor control (BUIC) sites, which provide backup air defense command and control.

VULNERABILITY OF SYSTEMS

Our air defense systems have not in the past been able to meet all of the objectives assigned to them. Command and control systems have been vulnerable, warning systems have been unable to detect all incoming aircraft using low-level penetration tactics, and our interceptors are too few in number and lack the "look-down shoot-down" capability required against low-flying bombers.

Because of this vulnerability and the reduced effectiveness of parts of our present air defense forces, we have decided to make some selected reductions in the current force levels, accepting some additional risks in the near term while pursuing development of more effective air defense components for the future.

CONUS OVER-THE-HORIZON RADAR (OTH–B) AND AIRBORNE WARNING AND CONTROL SYSTEM (AWACS)

To fulfill our air defense objectives, we propose to continue research and development efforts that will give us the option to deploy an effective, survivable, modernized air defense force. Our fiscal year 1973 budget includes research and development funds for two key systems: the Conus over-the-horizon radar (OTH–B), and the airborne warning and control system (AWACS). We are also requesting

funds to procure three AWACS test aircraft that could later be reconfigured as operational aircraft.

Chairman ELLENDER. You mention the over-the-horizon radar system designated "OTH–B." Why do we need this new radar system and AWACS?

Secretary LAIRD. I would like the chairman to address that.

Admiral MOORER. In one case, the over-the-horizon radar is a fixed land-based system, Mr. Chairman, which uses——

Chairman ELLENDER. What is presently used for this purpose?

Admiral MOORER. We don't have anything that will do this.

Chairman ELLENDER. But you have some kind of detection device today.

Admiral MOORER. The radar that we have today is confined to line of sight; it does not bend over the horizon. This particular radar will reflect a beam from the ionosphere back down to the target, affording far greater range detection. That is the difference.

The radar in AWACS is a line of sight radar. If the aircraft gains altitude, obviously, it extends the range of the horizon and, consequently, extends the range of the radar.

SYSTEM MISSIONS

Chairman ELLENDER. Are these systems interrelated?

Admiral MOORER. There is no connection between them. The AWACS has control functions. It can direct fighters to make intercepts, whereas over-the-horizon radar is simply a long-range detection device.

Chairman ELLENDER. AWACS is also a detection device, is it not?

Admiral MOORER. Yes, sir; but you have to detect in order to control. In order to control an aircraft and to generate an intercept between a target and fighter aircraft, obviously you have to have a radar picture of what is out before you.

But the over-the-horizon radar has an entirely different function. It gives early warning of the approach of a target, which the AWACS will bring under attack.

AWACS IMPROVEMENT OVER PRESENT USAGE OF C–135 AND A–6 AIRCRAFT

Chairman ELLENDER. Admiral, don't we have some operational aircraft today whose mission is the detection of enemy aircraft?

Admiral MOORER. There are both Navy and Air Force aircraft operating today—for instance, in Southeast Asia—which have the capability of detecting enemy targets and directing fighters in such a way that they would generate an intercept between our fighter and the enemy target.

Chairman ELLENDER. What do you call that system?

Admiral MOORER. The Air Force and the Navy have a version called the EC–1211 which has that capability. In addition, the Navy operates its E2A from the large carriers, and it has a similar capability.

Chairman ELLENDER. What relation has that system to the AWACS?

Admiral MOORER. The AWACS is simply a system which is designed for air defense of the United States and also for this tactical role that I just mentioned to you. It has a far greater capacity for

tracking simultaneously a large number of targets and bringing under attack a large number of targets at one time.

It is an advanced system. The concept is not new. It is just that the equipment and capability in this particular airplane is far advanced over those currently used by the Air Force and the Navy.

We have not used this concept with respect to continental air defense, which would also be a task of the AWACS.

Senator YOUNG. May I ask a question, Mr. Chairman?

Chairman ELLENDER. Yes.

OTH–B AND AWACS EXPENDITURES TO DATE

Senator YOUNG. When did you start research and development on the over-the-horizon radar system, and how much is spent each year?

Secretary LAIRD. Could I supply the amounts programed for OTH and AWACS in the past? I don't know exactly what they were in 1970, 1971, and 1972. I will break them out for the record.

Admiral MOORER. Here are the AWACS and over-the-horizon radar combined for 1971 and 1972.

Secretary LAIRD. That has AWACS as well as the over-the-horizon. Could I break that out?

Senator YOUNG. When will you be ready to deploy the OTH's?

Admiral MOORER. I think about 1975.

Senator YOUNG. These are research and development funds you are asking for?

Secretary LAIRD. Yes; only research and development.

Senator YOUNG. How much? You don't have it separated?

Admiral MOORER. No, sir; I will be glad to do that.

Secretary LAIRD. I have it combined in this statement. Let me break it out for the record at this point.

Senator YOUNG. If you went ahead with one, would you have to go ahead with both of them? Are they tied together that closely?

Secretary LAIRD. No, sir; they are separate programs. I regret they are combined in this statement, but I will break them out at this point in the record.

The combined cost I can give you. It is in the statement. We had $92 million for these two programs in 1971, which was the actual funding level for both. The planned funding level in 1972 for both systems is $142 million. The proposed funding is $474 million in fiscal year 1973 for both AWACS and OTH.

I will break that down by the two systems.

TOTAL COST OF SYSTEMS

Chairman ELLENDER. In addition to the information asked by Senator Young, I wonder if you could also indicate the ultimate cost for both systems, including research, development, production, and operation and maintenance?

(The information follows:)

The CONUS OTH Radar Program was initiated in FY 70. The program calls for the research, development and procurement for two radars; one each in the N.E. and N.W. corners of continental U.S. In addition, the program also includes research which could lead to the procurement of a third site north of the auroral zone. By the end of this Fiscal Year $10.3M RDT&E will have been invested in the program. We are requesting $4.4M RDT&E for FY 73 and estimate that $56M RDT&E distributed over the next five years will be required to complete

the program. The program is designed to convert the R&D radar into an operational radar at the completion of the R&D phase so that only one andditional CONUS OTH radar will have to be procured. Procurement of the additional radar is estimated to cost $26M. Annual operating and maintenance costs, including the costs of personnel, are estimated to be $12M per CONUS OTH radar.

CONUS OTH SUMMARY

[In millions of dollars]

	Prior years	Fiscal year 1973	Future years	Total
R.D.T. & E.	10.3	4.4	56	70.7
Procurement	0	0	26	26.0
Annual O. & M.	0	0	[1] 24	

[1] Year for 2 radars.

The AWACS program was begun in July 1970 and is divided into three phases: *Phase 1:* Brassboard Radar Demonstration: *Phase 2:* Design, Development, Test and Evaluation (including the System Integration Demonstration); and *Phase 3:* Production. The program is firmly tied to achievement of technical milestones to minimize cost and risk. Approval for the program to move to the next phase depends on successful demonstration of mandatory milestones and Defense System Acquisition Review Council approval.

The Air Force is using two (2) RDT&E test aircraft in Phase 1 to demontrate radar feasibility. Both these aircraft are used in Phase 2 testing and are reworked in Phase 3 to become part of the Air Force operational capability. We are requesting $309.9 million in FY 73 procurement appropriations to buy three (3) Category I and II test aircraft for Phase 2 testing. These three aircraft also go into the operational inventory after passing through Production (Phase 3). AWACS program costs are given below:

[In millions of dollars]

	Fiscal years				Total to completion
	1970 + P	1971	1972	1973	
R.D.T. & E.	92	87	139	160	880
Procurement	0	0	0	310	1,781
Total	92	87	139	470	2,661

Once AWACS becomes operational, the recurring annual cost of operating and maintaining the system is estimated to be $2.7 million (in FY 73 budget dollars) per U.E. aircraft. This covers operating and maintenance (O&M), military personnel, base operating support, depot maintenance, and investment.

DETECTION OF AIRCRAFT INBOUND TO UNITED STATES

Admiral MOORER. I would like to make certain that there is no misunderstanding. [Deleted.]

But what we are talking about here is an over-the-horizon radar system which would detect aircraft inbound to the United States.

Chairman ELLENDER. So is AWACS.

Senator ALLOTT. Mr. Chairman, may I direct a question to the admiral?

Forty-two thousand feet is your operational ceiling on a 707. Isn't it?

Admiral MOORER. Yes, sir. I think normally they are operated around 30,000 feet.

Senator ALLOTT. Yes, but 40,000 feet would be close to maximum. What would be your operational capability with the radar at that altitude in miles?

Admiral MOORER. I will check that. All you do is draw a line straight down——

Senator ALLOTT. I know, but an answer to this will help me.

Secretary LAIRD. The detection range against a bomber flying at high altitude would be about 360 miles, but let me give some more information for the record.

(The information follows:)

The specifications for the AWACS call for a radar detection range of [deleted] nautical miles against a bomber-sized target attempting to penetrate at high altitude. If a target of this size is at low altitude, the detection range is expected to be at the radar horizon. Against a target the size of an F–4 aircraft, the AWACS should have a detection range of [deleted] nautical miles, even if the fighter is at low altitude over hilly, wooded terrain.

Admiral MOORER. But it depends on how high the target is, too. You have to take into consideration, not only the height of the detecting device, but also the height of the target.

Senator ALLOTT. What I am trying to determine is where the horizon is when you are at 40,000 feet? How far out?

The reason I ask this, Admiral, is that it relates to one of the basic reasons for the over-the-horizon radar.

Admiral MOORER. Yes, sir. The over-the-horizon radar is not sensitive to the horizon. The standard radar we have been able to use so far is limited in range by the curvature of the earth. The difference is that the over-the-horizon radar bounces off the ionosphere down again back to the target. That is why the over-the-horizon radar has the long range; it is not limited by the distance to the horizon.

Senator YOUNG. Do the weather conditions make any difference?

Admiral MOORER. No, sir, not too much difference.

If you have a very heavy precipitation, it will make a difference, yes. Clouds can be seen and will limit it to some extent, but every radar is limited by weather and terrain.

Chairman ELLENDER. Any further questions?

You may proceed.

Secretary LAIRD. Mr. Chairman, could we now direct our attention to page 128 of my classified statement, and the discussion of ballistic missile defense.

SAFEGUARD

The Safeguard antiballistic missile defense system has been and continues to be designed to achieve several objectives outlined by the President to counter a combination of Soviet and Chinese threats. They include:

Protection of our land-based retaliatory forces against a direct attack by the Soviet Union.

Defense of the American people against the kind of nuclear attack which the Peoples Republic of China is likely to be able to mount within the decade.

Protection against the possibility of accidental attacks from any source.

A review was conducted again this year in accordance with the President's commitment of March 14, 1969. This review of Safeguard includes consideration of the technical progress of the system, the threat, and the diplomatic context, and I would like to highlight the discussion of these factors here with you this morning.

Technical Progress

The technical effort on Safeguard over the past year has progressed very satisfactorily and there are no technical problems which would affect a decision to continue the Safeguard deployment in fiscal year 1973.

Test results have been excellent. The second phase of the Safeguard system test program began in the fall of 1971. Of the seven tests conducted so far in this series, all have been successful.

Construction at the Grand Forks site is on schedule and about 80 percent complete. Construction at Malmstrom has been delayed by about 1 year by labor problems with corresponding delay in site readiness to early 1976. Construction at Malmstrom has been restarted.

All of the Safeguard ground equipment for Grand Forks at Malmstrom is under contract and procurement of equipment has been initiated for the Whiteman site.

Threats

The momentum of the Soviet nuclear threat continues and the nuclear capability of the Peoples Republic of China is increasing. I include a detailed discussion of the threat in chapter II of the Defense report.

Diplomatic Context

Negotiations on strategic arms limitation (SALT) continue. Current focus in SALT is toward obtaining an initial agreement covering ABM systems together with some limitation on offensive missile systems. However, we cannot at this time be certain that a SALT agreement will be reached or what the provisions of an agreement would be.

1973 Program

For fiscal year 1973, we propose to: (*a*) Proceed with the planned deployment at the four Minuteman sites; (*b*) Continue with area defense research and development under Safeguard and the advanced BMD program; (*c*) Initiate advanced preparations for defense of the NCA at Washington, D.C.; and (*d*) Continue with the Hardsite prototype development program discussed below.

This overall ABM program would:

Enhance probabilities for SALT success by maintaining both the flexibility and the strength of the President's negotiating position.

Provide a level of protection, dependent upon the nature and severity of the attack, for Minuteman, and command and control centers in the central United States (Omaha and Colorado Springs) at the earliest possible time, and a base for defense of inland bomber bases with improved area defense components.

Provide the means of affording added valuable time for decision-making and delegation of authority in the event of an attack on Washington, D.C.

Provide a continued option for introduction of advanced area defense at a later time, should this become necessary due to threat developments.

Provide the base for augmenting Safeguard defense of Minuteman sites with Hardsite defense if threat developments warrant.

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PROTOTYPE HARDSITE DEFENSE PROGRAM

With significant qualitative improvements in Soviet ICBM's even without increases in the number of Soviet ICBM's, the postulated threat to Minuteman in the last half of the 1970's could grow to a level beyond the capabilities of the four site Safeguard defense of Minuteman. Therefore, we propose a fiscal year 1973 Hardsite program funded at $80 million in R.D.T. & E. funds plus $20 million in construction that would permit initial deployment of the system in the [deleted].

Senator YOUNG. May I ask a question at this point? About how much will this Hardsite program cost?

Secretary LAIRD. That would depend on the number of sites at which you actually deploy the Hardsite system. We are merely asking for research and development and associated military construction funds in this budget as far as the Hardsite is concerned. It is a prototype demonstration program.

Senator YOUNG. When would you start hardening the sites? As far as the Air Force is concerned. I thought you were going to harden all of the sites.

Secretary LAIRD. This is a somewhat different program.

Admiral MOORER. Senator Young, the Hardsite program is a system that only defends the point in which it is located; in other words, the concept would be that you would have in the missile field a series of launchers and radars which would defend that particular missile field and nobody else. Whereas, in the Safeguard system as you know, sir, with the two kinds of missiles, it can reach out in many directions and cover areas other than the one in which it itself is located.

Secretary LAIRD. The Hardsite program is not connected with the hardening of the Minuteman silos. This is a point defense system to protect Minuteman silos from ballistic missile attack. The Air Force, of course, has outlined a program to harden the missile silos but this is a hard site defense, which means it is limited to a defense of the missile area itself.

I think it is the term that bothers some and it bothered me, too. "Hardsite" is just a title that is given to this kind of a ballistic missile defense system.

Senator YOUNG. Is it connected with the ABM?

SPRINT AND SPARTAN MISSILE MISSIONS

Secretary LAIRD. It is a specific type of ABM system, limited to a specific area. It does not give area defense coverage beyond the missile site area.

Senator YOUNG. You are talking about the missiles used by ABM?

Secretary LAIRD. The defensive missile would be located in areas where we have Minuteman missile silos. This defense would have the Sprint type missile rather than the Spartan type missile system.

Senator YOUNG. This program would be to protect the Sprint and Spartan?

Admiral MOORER. No, sir. The Safeguard system has two missiles, the Sprint and Spartan. Spartan is the long-range missile and Sprint is the short-range missile. The idea is to shoot first and then look and shoot again as the incoming warhead comes closer to the target.

The Hardsite concept envisions having nothing but the short-range Sprint type missiles which could only protect the area or the point in which they were located. It would be a cheaper way of defending a missile site, if that were the only mission of this particular missile system.

Secretary LAIRD. If we could go off the record here——

Chairman ELLENDER. Off the record.

(Discussion off the record.)

FUNDING FOR SITE CONSTRUCTION

Chairman ELLENDER. I understand you have in the budget almost $1.5 billion for Safeguard. Is that to be used for research and development or for deployment?

Secretary LAIRD. That is for deployment at four sites, and in advanced preparation for a fifth site in the Washington, D.C., area. That is what that money is for.

Chairman ELLENDER. You mention four sites. I assume you had reference to full deployment at Grand Forks and Malmstrom, and advance preparation at the Whiteman and Warren sites.

Secretary LAIRD. That is correct, Mr. Chairman. And as I stated we are requesting funds for advance preparation of the fifth site in this budget.

Chairman ELLENDER. In the $1.5 billion?

Secretary LAIRD. Yes. That is to fund that program in fiscal year 1973 as we proceed on those four sites and on the preparation for a fifth site in the Washington, D.C. area.

MODERNIZATION OF GENERAL PURPOSE FORCES

Mr. Chairman, could we put in the record at this point the sections of my defense report dealing with modernization of our General Purpose Forces—the ground tactical aid and naval forces. Those sections discuss a number of important new systems that I particularly want to bring to your attention, such as the F–14 and F–15 aircraft, the Cheyenne helicopter, the sea control ship and patrol frigate. In addition, I would also like to insert the discussion in the defense report of our efforts to improve the weapon system acquisition process and deal with the problems we inherited with such systems as the Mark 48 torpedo, the C–5 and the F–14.

(The excerpt follows:)

a. Modernization of Our Ground Forces

There are a number of important programs which comprise our plan to modernize the ground forces of the Army and Marine Corps. While later witnesses will discuss these in detail, I will highlight several major elements which I believe are of particular importance to our overall objective of improving ground combat effectiveness.

New Main Battle Tank Program. Action has been taken to terminate XM803 (MBT-70) tank development consistent with the action of the Congress last year. The Army has initiated a new tank development program with the immediate goal of defining design and performance characteristics which will enable the Army to field a tank capable of meeting the Main Battle Tank mission within the guidelines and constraints established by Congress. The program will take maximum advantage of lessons learned and technology developed in the MBT-70 program, as well as knowledge and experience gained from other tank and tank related programs conducted in recent years. The funds requested for FY 1973 will sustain both the planning effort and development of the most promising componentry until prototyping of complete systems can begin in FY 1974.

M60 Tanks. To continue improvements and retrofit of the M60 Series tanks, $114 million is included in the FY 1973 Budget. Of this, $10 million will be used for a conservative product improvement program to upgrade the M60 Series tanks, the Army's current main battle tanks. These improvements will provide for better performance and longer life. The remainder is for the production/retrofit of 316 M60A2 tanks. This will complete a program which provides a total of 540 missile firing tanks, not as a substitute for, but to complement our main battle tank.

In addition, the Army plans to continue its procurement of M60A1 tanks and has included $49 million for 166 M60A1 tanks.

TOW and DRAGON. Deployment of the TOW to Europe began in 1970 and by the end of this year the Army will have all of these forces. We used competitive procurement for both launchers and missiles in FY 1972 and will realize a significant reduction in costs.

The DRAGON is a light weight anti-tank system designed to be hand carried by most forward ground combat elements. Like the TOW, it is destined primarily for our European based forces. Funds for the first year's procurement are included in our current budget request.

LANCE. Continued procurement of the LANCE missile system is planned for FY 1973 and $95 million is included for this purpose. This system will replace the aging HONEST JOHN and SERGEANT systems. LANCE will have a primary nuclear warhead capability, and with greater mobility and quicker reaction time, will provide our ground forces in Europe with considerably increased survivable firepower. These improved characteristics will allow the Army to replace HONEST JOHN and SERGEANT battalions with LANCE on a less than one-for-one ratio with significant savings in manpower.

FY 1972 funds for the development and procurement of a non-nuclear warhead for the LANCE were recently deleted by both Congressional Appropriations Committees. The Army is preparing a request for Congressional approval to reprogram funds to continue non-nuclear warhead development. No FY 1973 funds are included for procurement of this warhead.

Advanced Attack Helicopter. During the past year, the Army has made an extensive examination of the handling qualities, weapons accuracy, avionics performance and human engineering of the CHEYENNE Attack Helicopter. Over 1400 hours of test time have been accomplished in the development of the program. The majority of the testing has been under Army supervision at the YUMA Proving Ground and both Army and civilian pilots have participated. The test aircraft have met most of the desired requirements of performance and the weapon subsystem have exceeded the Army's expectations, particularly in day and night firing of the TOW missile. Before any procurement, the Army is also making a detailed evaluation of the attack helicopter concept and the necessary system requirements. In this evaluation, the Army is expanding its evaluation of requirements by examining two industry sponsored prototypes. The results of this testing effort will be available in early FY 1973. The information obtained from the review of the industry sponsored aircraft and the results of the operational testing of the CHEYENNE together with other information, will provide the basis for a decision to proceed further in FY 1974.

Heavy Lift Helicopter (HLH). The FY 1973 Budget includes $53 million for continued development of the Heavy Lift Helicopter (HLH). Funds will support continued development of the critical components (rotor, transmission, drive system, flight control system, cargo handling system) of a tandem rotor helicopter. Development of engines to power a Test Stand for dynamic critical components will also continue. Funds are provided for initial development of a single prototype.

Utility Tactical Transport Aircraft System. The Army has entered the contract definition phase of development on a helicopter to replace the UH-1H in the air assault role in the 1980's. This helicopter, the Utility Tactical Transport System (UTTAS), will be the Army's first true squad assault helicopter. Its mission will be to transport combat troops and their organic mission-essential equipment in the assault, resupply those units while in combat, and perform the aeromedical evacuation mission. Industry proposals for developing this helicopter are expected on 31 March 1972, and the FY 1973 Budget includes $64 million for this program.

SAM-D. The FY 1973 Budget includes $171 million for engineering development of the SAM-D system which is planned to replace NIKE HERCULES and HAWK whose basic designs date from 1950's.

Technology advances in electronic countermeasures hold the potential for further degradation of our current air defense system effectiveness. SAM-D is being designed to maintain its effectiveness in an intense electronic countermeasure environment. By using the latest in digital signal processing and self-test concepts, the programmed SAM-D replacement of NIKE HERCULES and of HAWK will

reduce personnel requirements substantially. FY 1973 will be the first full year of Engineering Development with completion scheduled for the late 1970s.

Marine Corps Modernization Program. The few unilateral Marine Corps development programs normally relate to capabilities peculiar to landing force operations. Such programs as the LVTP-7 and the improved CH-53 Helicopter are good examples. Many other service development programs can, and do, relate directly to Marine Corps requirements. Examples include the DRAGON and REDEYE missile programs. The Marine Corps follows these programs closely, and uses many of these systems once developed.

Modernization of Reserve Ground Forces Components. Turning now to the availability of equipment for allocation to the Reserve components, deliveries of combat serviceable equipment to the Army's Reserve components in Fiscal Year 1971 had a dollar value of about $726 million, compared with our estimate last January of $450 to $600 million. These issues included 6,500 tactical radios, almost 15,000 wheeled vehicles, approximately 287,000 M-16 rifles, and 52 M-60 tanks. Equipment issues for Fiscal Year 1972 are forecast now to exceed $900 million, and in Fiscal Year 1973 they are expected to be more than $1 billion in value. These forecasts are based in part on programmed repair of serviceable, combat capable equipment in depot stocks. This year's budget includes special funds dedicated to the rework of equipment for issue to the Army Guard and Reserve.

If the projected flow of equipment is maintained, the Army's Reserve Components should have 99% of their authorized aviation assets by the end of Fiscal Year 1973 and all substitute and obsolete aircraft should have been withdrawn; other essential equipment requirements for early deployment combat units should also be met by the end of Fiscal Year 1973; and the remaining units should be substantially equipped by the end of Fiscal Year 1976.

The Marine Corps Reserve division units continued to be equipped in phase with the Active Marine Corps divisions. Marine Corps Reserve Aircraft Wing units are also continuing to modernize with CH-46 and CH-53 helicopters replacing the CH-34s and RF-4s replacing the RF-8s. As in the Naval Air Reserve, the A-4Cs are being supplemented by later A-4E and A-4L models.

The ground force modernization programs described in this section, which represent only a portion of our overall modernization program, will definitely improve our force effectiveness. Additional modernization effort is shown on the summary page. In addition, Secretary Froehlke and General Westmoreland will be prepared to discuss in considerable detail all aspects of the Army modernization program, as will Secretary Chafee and General Cushman for Marine Corps programs.

2. Tactical Air Forces

The threat presented earlier poses a wide range of potential conflict situations in which military response might be required. The tactical air force structure described in this section provides

to the National Command Authorities a variety of options, ranging from small, conventional deployments to large scale conventional and/or tactical nuclear operations. These forces are being structured to provide the responsiveness, positive control, and overall capability best suited to provide a wide variety of options to meet the requirements of our strategy.

The flexible nature of tactical air forces enables elements of the combat and supporting forces to be deployed as a package to meet threats to our national interests at the level of theater or subtheater conflict. These contingency force packages can be configured to expressly counter threats to our allies or for minor contingency situations where rapid reinforcement or force presence may be required.

In supporting the overall strategy, tactical aircraft provide a capability to carry out a variety of missions, including close air support, interdiction, counter air (both fleet and area), reconnaissance, tactical airlift, and special purpose missions. The majority of our tactical fighter/attack aircraft are capable of effectively performing several of the fighter and attack missions. The F-4 Phantom is perhaps the most well-know example, although the A-6, A-7 and F-111 also possess this capability.

Close air support missions are flown against enemy forces in close proximity to friendly forces. In FY 72-73 the primary fixed wing close air support aircraft will be the multi-service F-4, the Marine Corps A-4, the Air Force/Navy A-7. As the newer A-7D/Es enter the forces, they will substantially improve close air support and interdiction capability.

Both the Air Force and Navy have the capability to fly interdiction missions against a wide range of land and sea targets. Tactical aircraft with primary interdiction capability are the Air Force F-111, the multi-service F-4, Air Force/Navy A-7, and the Navy/Marine Corps A-6. The capability of these forces are being significantly improved by the addition of the F-111F, the A-6E, and the A-7D/E.

General purpose force air defense/air superiority missions are flown to protect friendly air, sea or ground forces from enemy air attack. The primary aircraft for these missions is the F-4, although the Navy does operate some F-8s for fleet air defense.

Reconnaissance aircraft provide surveillance of enemy activity through day and night photography, side looking radar, and infrared imagery. The Air Force and Marine Corps operate RF-4Cs to provide reconnaissance capability while the Navy operates RA-5Cs and RF-8 aircraft from carriers.

Tactical airlift provides the theater commander the capability to support deployed forces, to forward deploy forces from air and sea ports and to employ and resupply ground combat forces.

Special purpose aircraft are used in electronic warfare (detection of and countermeasures against enemy electronic emitters), special operations forces, tactical air control (enroute and terminal control

of tactical aircraft), and airborne early warning (airborne search radar). Our FY 1972-1973 forces include a variety of special purpose aircraft: EC-121s used in SEA, A-37s used to provide ground support in lightly defended areas, Navy E-2s used as airborne radar platforms for the fleet, and EA-6B and EB-66, EB-57 and EC-47 electronic countermeasure aircraft. In addition, the Marine Corps maintains EA-6A aircraft for an ECM capability.

In order to meet the NATO threat, yet retain the flexibility and quick response capability to provide adequate support in Asia and other areas, in FY 1973 the Air Force will operate 72 active fighter/attack squadrons and 39 reserve squadrons. In addition, the Navy will maintain 70 active and 10 reserve Naval fighter/attack squadrons in FY 73. The Marine Corps will operate three active wings and one reserve wing as part of their Division/Wing teams. In addition to these tactical forces of the Air Force, Navy and Marines, 23 active reconnaissance squadrons will be operated along with six reserve squadrons.

a. Modernization of Tactical Air Forces

Modernization of our tactical aircraft forces is needed in order to meet the threat I described in the previous chapter. Newer Soviet aircraft that must be countered include such systems as the FOXBAT and a variable geometry attack aircraft.

Fighters

The increasing number and quality of aircraft being developed by the Soviet Union increases the risk associated with gaining and maintaining air superiority in any potential NATO/Warsaw Pact conflict. Air superiority in such a conflict is essential, if we are to conduct effective close air support and interdiction tasks without undue interference from enemy aircraft. The task of gaining air superiority when the enemy is operating in a friendly radar environment is extremely demanding and requires long-range aircraft with on-board systems for detecting enemy aircraft. The Air Force is developing the F-15 for this purpose. It is specifically designed to excel in air-to-air combat and is expected to have excellent maneuverability -- a vital factor in close-in air-to-air combat. The FY 1973 Budget contains $454.5 million for the F-15 development program, and $422 million for procurement of the first 30 F-15s, plus $34.4 million for initial spares. Emphasis in early FY 1973 will be on obtaining flight testing experience before a production decision is made in the latter part of the fiscal year.

We are carefully examining the advanced technology applicable to the development of a low-cost single-purpose, fighter aircraft that could be procured in large quantities. This prototype project should help us obtain better information on costs and operational suitability before deciding upon development. A total of $46 million is requested for the prototype lightweight fighter program in FY 1973. In addition, with our new emphasis on tailored programs for security assistance to our friends and allies under the Total Force Concept, 90 F-5Es are being procured in the MAP/MASF program to help our allies provide air defense against Soviet type aircraft.

In order to modernize the Navy's tactical aircraft, the Navy is continuing to procure the F-14 in FY 1973 for fleet air defense and air superiority missions. Once operational, the increased capability of the F-14 with the PHOENIX missile system will provide a better defense against the increasing air-to-surface missile threat to the fleet than is currently provided by the F-4. In addition, the increased range and radar capability compared to the F-4 will enable the F-14 to more effectively protect strike aircraft in the force projection mission.

A total of $570.1 million is requested this year for procurement of 48 F-14As. An additional $162.6 million is included in our RDT&E request for the F-14, and $2.1 million for military construction.

There has been a great deal of controversy about the F-14, particularly with respect to its cost and estimated performance. I will discuss the contractual problems in a later section on organization and management. I do regard the existing contract as a valid and binding one.

With respect to F-14A performance, the plane has met specifications to date. Nine aircraft are now in a flying status with full radar and weapons systems tests scheduled during the next few months.

Attack Aircraft

In FY 1973 the Air Force will complete the procurement of three wings of A-7Ds. These aircraft, with the integral computer-aided, visual-delivery system, will provide increased capabilities in the close air support and interdiction mission areas. The A-7Ds are intended to replace the F-100s and a majority of the F-105s in the Air Force inventory.

In addition to the A-7D, we are improving our attack capability by procuring 12 F-111Fs for $160 million in Fy 1973 to complete a fourth wing of F-111s for the Air Force. The Air Force has procured the F-111F primarily for the long-range tactical interdiction role. With its radar bombing capability, the F-111 is particularly useful at night or in bad weather conditions. The F-111 and the A-7 can also serve a role in anti-surface ship operations -- a capability which could be directly applicable to total force operations in areas such as the Mediterranean, the North Sea and the Caribbean.

Reserve Fighter/Attack Aircraft

General Ryan, in his statement to the Congress, indicated the significant progress made by the Air Force in its program to modernize the Air National Guard and the Air Force Reserve. These are ready forces capable of responding on very short notice. Many of these units participate on a continuing basis with the regular forces and can easily integrate into these forces, if activated. The units in the process of transitioning to more modern and capable aircraft are intensifying efforts to complete their readiness training.

By the end of Fiscal Year 1973, the fighter force within the Air National Guard and Air Force Reserve units is expected to include

six squadrons of F-105s, one of F-104s and one of F-4s. The attack segment of the Air National Guard is scheduled to have 25 F-100 squadrons, 3 A-37 units, and one unit of B-57Gs. The ANG will also possess one F-105 and one F-100 training squadron, in addition to the number indicated above. Additional modernization will be accomplished as more F-105s and F-4s become available from the Active force.

Modernization of Naval Air Reserve fighter/attack aircraft continued with a second F-8 fighter squadron being formed and a second squadron converting from A-4s to A-7s. All A-4C aircraft are scheduled for replacement with A-4E and A-4L models, and the F-8H fighters will be replaced with F-8Js in Fiscal Year 1973.

Special Purpose Aircraft

In addition to modernizing our fighter and attack aircraft, we are increasing the capability of our tactical air forces by making improvements in special purpose aircraft. The FY 1973 Budget contains $184 million for 7 EA-6Bs and $170 million for 8 E-2Cs, plus $26 million for development of the two aircraft. Funds are included in the FY 1973 budget submission for the development of an Airborne Warning and Control System (AWACS) that can be used not only for strategic air defense, but for tactical air control as well. The application of AWACS to the tactical mission area will enable the Air Force to consolidate in one aerial platform a variety of the functions, i.e., radio relay, command and control, etc., now being performed by many different aircraft.

The Navy is procuring the EA-6B to provide electronic countermeasures to assist A-7s and A-6s in penetrating sophisticated enemy defense. The Air Force is developing a modification to early F-111s using EA-6B electronics to provide similar escort capability for Air Force interdiction aircraft. Both the Navy and the Air Force are developing airborne early warning aircraft: the Navy is providing the E-2C for fleet air defense while the Air Force is developing a tactical version of AWACS.

The Air Force Reserve added this year a squadron of EC-121s to perform an Airborne Early Warning and Control Mission. Air rescue units of the Air Force Reserve are being completely modernized with the transition to HH-34 helicopters and HC-130 fixed wing rescue craft. ANG tactical reconnaissance units are converting to RF-4s. Some of the former reconnaissance units are converting to the attack mission.

Air Munitions and Missiles

FY 1973 will be the second year of a five-year procurement program to build an inventory of more sophisticated, more effective air munitions. When completed, this modernized air munitions inventory will, through a higher degree of effectiveness per sortie, improve the ability of our fighter/attack aircraft to achieve desirable effectiveness with fewer sorties and less exposure to anti-aircraft defenses.

This air munitions modernization program calls for significant additions of new munitions with better target destruction capability than those currently in the inventory. For example, the FY 1973 Budget contains $128 million funds for: ROCKEYE -- a specially designed cluster bomb with anti-armor applications. The FY 1973 Budget also contains $42 million for laser-guided bombs -- a much more effective free-fall bomb. Moreover, the TV-guided WALLEYE glide bomb program is being modernized to provide a weapon with a larger warhead and greater stand-off range.

Modernization of the tactical air-to-ground missile inventory includes $61 million in FY 1973 for procurement of the TV-guided MAVERICK missile for the Air Force. The MAVERICK, with stand-off features, is designed to provide significant improvement in our anti-armor capability. The FY 1973 R&D budget contains $58 million for HARPOON, a radar-guided anti-ship missile capable of being both ship-launched and air-launched, and a promising counter to Soviet surface ships capable of launching cruise missiles.

Modernization of the air-to-air missile inventory is aided in FY 1973 by $5 million R&D and $95 million procurement for PHOENIX, $12 million R&D and $97 million procurement for an Improved SPARROW, and $7 million R&D and $29 million procurement for an Improved SIDEWINDER. The PHOENIX missile system is designed to provide the F-14 with a long-range, multi-shot capability for improved fleet air defense capability. The improved SPARROW will be more reliable and more maneuverable in medium range air combat than current SPARROW missiles. The Improved SIDEWINDER will be more effective in close-in maneuvering air combat than earlier versions.

Close Air Support

During the course of last year's hearings the close air support issue was examined extensively, including a special study effort by former Deputy Secretary of Defense David Packard. The first report of his group was submitted to Congress in June 1971, recommending continuation of the development of the Army's CHEYENNE attack helicopter and the Air Force A-X. However, specific tests were outlined for each service to accomplish before procurement would be considered. We expect the first flight of A-X prototypes in June 1972. The two airframe contractors are each building two prototypes that will begin a competitive fly-off in November 1972. A total of $48 million in included in this budget for A-X development. Secretary Seamans has described the program in greater detail.

The report of the Close Air Support Review Group also recommended that we make certain tests with the HARRIER, a multi-mission V/STOL aircraft now being procured for the Marine Corps. We intend to continue with HARRIER procurement, and the FY 1973 budget contains $133 million for another 30 aircraft to provide flexibility in tactical operations.

The Army's development of advanced helicopter gunships is discussed in the section on land forces. The Department is proceeding with the recommended tests, and I have continued the

Review Group and have asked it to carefully examine Command and Control aspects of the close air support mission.

3. Sea Control and Other Naval Forces

The U.S. is a maritime nation dependent on sea lines of communication for international trade and support of our allies. As a maritime nation we strongly support freedom of the high seas for commerce in peacetime, and we must maintain access to vital sea areas in the event of conflict to ensure support to our own forces and European and Pacific allies.

More specifically, in the Atlantic and Mediterranean area our forces, together with those of our NATO allies, should be capable of sea control operations to help ensure protection of deployed U.S. forces, military support shipping and an austere level of economic support.

In addition, U.S. and allied forces should be capable of keeping sea lines of communication to Europe open indefinitely at a minimum necessary supply level against a maximum Soviet naval interdiction effort.

In the Pacific, U. S. forces should be capable of supplementing the forces of our Pacific allies to ensure that a minimum necessary level of supplies can be maintained against expected threats to the sea lanes.

Our basic military strategy reflects these requirements, and a strong Navy is required to fulfill them. However, I would point out that under the Total Force Concept, the forces of our other Services can and do contribute to meeting this requirement, just as allied forces also contribute to overall capability. Moreover, our naval forces can and do operate in support of land operations.

The naval force levels that we are planning for FY 1973 include 16 aircraft carriers, a total of 242 missile cruisers, frigates, destroyers, destroyer escorts, and active naval reserve escorts, 60 nuclear and 27 diesel-powered attack submarines, and 66 amphibious ships. Counting all ships, the program includes a total of 594 active fleet ships and 58 Naval Reserve Force ships. For comparison, the planned end FY 1972 active fleet strength is 657 ships.

a. Modernization of Sea Control and Other Naval Forces

Aircraft Carriers. At the end of FY 1973, the aircraft carrier force will consist of nine FORRESTAL Class or larger, including the nuclear powered ENTERPRISE, plus three MIDWAY Class and four older carriers. The average age of the current carrier force is now over 18 years, with two ships now over 28 years old. Two nuclear powered carriers, NIMITZ and DWIGHT D. EISENHOWER, are under construction and are scheduled for commissioning in 1973 and 1975. The carriers will be ready for operational deployment about one year after commissioning.

As I stated last year, I am convinced that our responsibilities in the Atlantic, the Pacific, the Mediterranean and other ocean areas

require that we proceed now with the construction of an additional nuclear powered carrier for the Navy to insure adequate aircraft carrier capabilities for the 1980's and beyond. The CVN-70 is needed to continue the modernization of our sea-based tactical air forces; it will replace an old conventional carrier.

We are requesting $299 million in FY 1973 to procure long lead time items for CVN-70, which the Navy currently estimates will cost almost one billion dollars. The Navy will give details on its current cost estimate in its presentations to the Congress. This carrier, along with the USS ENTERPRISE and the two others currently under construction would provide us with four nuclear carriers, enabling us to operate two on each coast.

Other Programs. We are pursuing several important programs for modernizing and updating our other surface combatants. One of them is the construction of 30 new DD-963 destroyers, to be built by Litton Industries. Sixteen of these ships have already been funded, and the FY 1973 Budget includes $612 million to procure seven more ships. We now plan to procure the last seven of the ships in FY 1974. In addition, the budget includes $118 million to modernize two more guided missile frigates.

The Navy is also proceeding with construction of three new DLGN-38 class frigates, which will be equipped with both anti-aircraft and anti-submarine weapons. These three ships are to be constructed on a multi-year contract.

The weapons systems of our surface combatants presently are undergoing a comprehensive updating. The interim surface-to-surface missile system and surface-to-air missiles such as the STANDARD, BASIC POINT DEFENSE and NATO SEA SPARROW, are providing enhanced defense against certain high performance and long-range targets. In addition, a new surface-to-air missile system, AEGIS, and surface-to-surface system, HARPOON, are under development for our surface combatants. This year, increasing numbers of combatant ships will be equipped with LAMPS helicopters, which will increase the ship's surface surveillance capability and also provide active ASW coverage out beyond the range of ship mounted sonars. Most new surface combatants will have an aircraft capability to complement that of the primary aviation ships.

Naval Reserve surface forces have also been upgraded with more modern destroyers replacing older ships. During this past year the numbers of Naval Reserve ships were increased by three destroyers and three minesweepers. Proposed transfers in FY 1973 are three minesweepers and two tugs, with additional forces, including carriers, programmed for future years. The Navy is studying plans to place more ships in the naval reserve as Active force levels are reduced.

Increasing emphasis is being given to ship-based aircraft for sea control operations. The Navy is continuing its evaluation of the "CV concept," aboard the USS SARATOGA. This approach involves employing attack, fighter, and ASW aircraft from the same ship, thus vastly increasing the range of threat response available on our carrier decks. The mix of aircraft on each CV will be especially tailored for its mission, ranging from primarily ASW to primarily

attack. The Navy's experience to date indicates that the "CV concept" has considerable merit.

The nuclear-powered attack submarine (SSN) is also an important element of our sea control forces. These ships can perform a number of sea control missions. They can be used as barriers across strategic "choke points" to prevent an adversary's forces from getting to sea or returning home. They may also serve as open-ocean search and destroy forces, or in attacking opposing surface ships.

The Navy is continuing its major program to construct new SSN-688 class ships. The number of SSs in the force will decline in future years as more new SSNs are delivered and the Navy moves closer to an all-nuclear force that is highly capable in the ASW role. The new 688-class SSNs will have a propulsion core life of more than ten years, as well as speed and other characteristics that are much improved when compared with those of earlier classes. Twelve of them are already under contract, and the FY 1973 Budget includes $1,042 million to procure six more of these ships.

The submarine's primary weapons system consist of passive sonar and acoustic homing torpedoes. The recently-initiated procurement of the MK-48 torpedo should provide a significant improvement in our combat power. The advanced sonar being installed in the 688 class SSN will also add to this submarine's potential. We are also requesting funds to maintain development options for an advanced high performance SSN and a long range cruise missile.

The MK-48 Torpedo program is of major importance to the effectiveness of U.S. nuclear submarines against the current and projected Soviet naval threat. The MK-48 Mod 1 was selected in July 1971 for quantity procurement. Production is on schedule and this torpedo is scheduled to be introduced into the fleet in the near future. While this program has experienced many problems in the past, the Navy is now proceeding with the operational evaluation, with satisfactory results to date. A total of $184.1 million is included in the FY 1973 Budget for the MK-48. These funds are primarily for procurement of torpedoes and related equipment, but also include $7 million for R&D to exploit the results of the test and evaluation program.

Our air anti-submarine program is designed to provide a balanced force of both sea-based and land-based air ASW forces. Each possesses unique advantages under difference tactical situations and in different tactical domains. The increased range and area coverage and improved sensing devices that our air ASW forces will attain should further enhance the effectiveness of airborne ASW.

The new fixed wing carrier-based ASW aircraft, the S-3A, is planned for fleet introduction in February 1974. This aircraft will be much more effective than the one it replaces, the S-2, and it will help to cope with the large Soviet submarine threat.

The S-3A development program is proceeding on schedule, and has met the first two milestones. The FY 1973 RDT&E budget contains $37 million to complete the major portion of the development effort. We also propose to procure the second increment of production.

aircraft in FY 1973, and the FY 1973 Budget includes $628 million for 42 aircraft. The budget also includes a small amount for military construction for this program. This procurement, along with the 13 aircraft authorized in FY 1972, will provide sufficient aircraft to convert the first fleet squadrons to S-3As in 1974.

The land-based patrol ASW aircraft are also an important part of our ASW forces. The Navy now maintains a force of 24 squadrons of the land-based P-3 ASW aircraft and expects to retain this force level for the next few years. We have been procuring the new P-3C aircraft with the more capable A-NEW avionics system to replace older P-3As and P-3Bs. These latter aircraft are being transferred to the Reserve forces as they are phased out of the Active forces to replace obsolete P-2 aircraft. The Third Reserve Squadron will complete the transition from P-2s to P-3s in FY 1973.

We propose to continue procurement of the P-3C in FY 1973, and the budget includes $246 million to buy another 24 of these aircraft. Other programs included in the FY 1973 budget to improve sea control capabilities include:

-- Patrol Frigate (PF). The PF will be a relatively small, gas-turbine propelled escort designed to protect convoys, amphibious forces and underway replenishment groups from air and submarine attack. It will not have the size and all the capabilities of our frigates and destroyers, but it should also cost much less than those ships. The FY 1973 Budget includes $193 million to complete design and fund start-up costs, as well as build the lead ship.

-- Sea Control Ship (SCS). Another ship currently in the review and design stage within the Navy is the sea control ship. Current Navy plans call for this ship to carry a mix of helicopters and Vertical and Short Take-Off and Landing (V/STOL) aircraft to help protect underway replenishment groups, amphibious forces and military convoys. The precise characteristics, size and estimated cost of the SCS are uncertain at this time. We have included $10 million in the FY 1973 Budget to finance the design effort, and hope to move ahead with procurement of the first ship in FY 1974.

-- Surface Effects Ship (SES). The Navy has been working on test surface effects craft of various sizes for the past few years. If successful, this effort should produce ships with speeds in the range of 80-100 knots and capable of reasonably long range operations.

-- Hydrofoil Patrol Boat (PHM). These ships should be about twice as fast as current surface combatants. The Navy plans, in conjunction with NATO allies, to build a missile-carrying hydrofoil boat designed to operate in littoral waters. The FY 1973 Budget includes $60 million for the initial procurement of two PHMs.

The amphibious ship force at the end of FY 1973 will include 67 ships, with a capability to lift the assault elements of slightly

more than one Marine Amphibious Force (MAF). To provide modern 20-knot ships, we are procuring five LHAs (a large ship capable of handling both helicopters and surface landing craft) and will accept delivery of the last of 20 new class LSTs.

The LHA construction program is behind schedule. These ships, and the DD-963 destroyers that I mentioned earlier, are being built by Litton Industries in a new shipyard. Problems have been experienced in this new and complex ship facility at Pascagoula, both in technical operation and in recruiting a proper workforce.

The Navy has advised me that LHA design work was not completed on schedule, and that this has retarded the DD-963 ship design work. At this time the LHAs are expected to be delayed 12-16 months, but it is not yet known what impact this delay will have on the DD-963 construction program. The Navy will be prepared to discuss this subject in detail.

In order to minimize fleet dependence on shore facilities, the Navy maintains a force of mobile support ships comprised of Tenders, Underway Replenishment Group (URG) ships, and other support ships. Many of the existing ships are old and obsolescent and in need of replacement. As a start on the modernization needed in this area we have included funds for four new support ships in the FY 1973 Budget.

D. IMPROVEMENTS IN WEAPON SYSTEMS ACQUISITION

Weapon Systems Acquisition remains a matter of concern and action in the Department of Defense and one of significant interest to the Congress. It has long suffered from inefficiencies and cost growth. Last year, I reported to you on changes that we have made in the process.

We are now beginning to see some positive results from these policy and procedural changes. The Services have extensively streamlined the management and reporting structure within their systems acquisition functions. Program managers are much more clearly vested with the responsibility and authority necessary to operate effectively and expedite decision making. Our new major program initiations are all characterized by the competitive development, or "fly before buy" concept of management. The Services have also begun a longer range activity of investing in technology for the future through modest prototyping programs. We are just beginning to see the fruits of these labors and expect our future payoffs to be substantial.

Today I would like to outline problems that remain and bring you up to date on our continuing efforts to improve this process.

We all recognize the role that my former Deputy, Dave Packard, played in improving weapons systems acquisition. He brought order out of chaos and provided us with common sense policies for weapon systems acquisition. Just before he left I asked him for his thoughts on what we had learned and what we had accomplished during the past

three years. I would like to pass on a few of his thoughts: he identified four factors that seemed to have gotten us in trouble in the past:

-- The initial decision was wrong, resulting in projects that were too ambitious or unrealistic, and often in project cancellations.

-- Department of Defense management was not as effective as it should have been.

-- Cost estimates were unrealistic and accepted even when we could have known better.

-- Defense industry was in trouble in both its management and finances. To a significant degree, their problems were the product of bad Department of Defense procurement policies.

I believe, and he agrees, that we have taken constructive action in each of these four areas and that we can see marked improvement in all of them. At the same time, there are active programs initiated years ago that still bear the problems that these four factors have generated. Let me list a few examples:

The Mark-48 Torpedo is designed to provide a capability critically needed by the Department of Defense. When we first looked at this program it was in serious trouble both technologically and financially.

It must be recognized that this program was too far along to assume that we will not have problems in the future. We have taken many corrective actions. We did restructure the program. We placed greater emphasis on competitive testing under the most realistic conditions. We then made a procurement decision and selected the contractor we believed had the best proposal and the best comparative capability. At the same time, I want to strongly emphasize that we have not solved all the problems associated with this program. Testing continues and reliability has improved. I hope that the MK 48 will finally meet our needs. I will continue to watch it closely.

The C-5A has come to be the example of all that can go wrong in weapons systems acquisition. It suffered from every one of the four major factors identified by Dave Packard. It is obvious that if we could start over at the beginning of the program, we would do it very much differently -- but those decisions were behind us. We will continue to watch the C-5A closely and do all that we can do to obtain this needed lift capability. At the same time it is clear that the C-5A cannot, and probably never could, meet all the design objectives specified in the original contract.

The F-14 program is another program that warrants and will receive, our closest attention. It, too, has suffered to some degree from each of the four major factors that have created problems in weapon systems acquisition. The testing of the F-14 airframe and avionics has just begun. This testing is critical since the demon-

strated effectiveness of the F-14 will be the primary factor that I will consider in making any further decisions on the F-14 program. I am recommending that the Congress authorize $735 million for the F-14 for FY 1973. I urge your support of this request. This authorization will permit us to retain the contractual commitments that we have negotiated with the Grumman Aircraft Corporation and will provide us the financial authority to exercise an option for the procurement of 48 aircraft in Lot V. While the contractor has indicated that he is unwilling to accept this option, we retain the position that we have a valid and legal contract with Grumman. I want to reassure the Congress that the option on Lot V will be exercised only if I am convinced that the F-14 will provide the capability that the Navy needs and at a realistic cost. The Department of Defense has a significant investment in the F-14 in time and in money, but I want to make it very clear that the investment that we will have made is non-recoverable and that my decisions on the F-14 will be based solely upon its demonstrated effectiveness and not upon cost already incurred as a result of earlier decisions.

A final area of major concern is the Navy Shipbuilding Program. I have recommended and strongly support a Shipbuilding and Conversion program of $3.6 billion for FY 1973. I have described in some detail the objectives of our Strategy of Realistic Deterrence, the threats that we face in reaching these objectives, and our great need for improving and modernizing our naval forces. Despite this urgent need, I cannot and will not accept the serious inefficiencies that we have earlier observed in our shipbuilding program. We need a modern and efficient Navy and we need to procure and operate it in an efficient way. I assure you that I will give equal attention to both of these needs.

I have identified those factors which made things go wrong and some of the continuing programs that were affected by these factors. Let me briefly comment on what I think we have done to minimize the effect of these factors.

1. Decision-Making Factors

First, we have a better basis for improving the initial decision to move forward on a contract. In this Administration we have received clear guidance on the President's objectives in national security affairs. Our efforts to accomplish net assessments will enable us to make better decisions on actual requirements and the initial decisions to meet those requirements. We have also made major changes in the internal decision-making process within the Department of Defense. We give new recognition to the views of the Joint Chiefs of Staff and of all of our personnel in uniform. This increased responsibility given to the Secretaries of the Military Departments has resulted in a marked improvement in their management and recommendations. All of these steps have resulted in recommendations to the Secretary of Defense that are both more relevant and more realistic in their demands in terms of both cost and technology.

As part of the weapon systems acquisition process we have placed increased emphasis on the use of hardware to demonstrate capabilities rather than paperwork to describe them. The prototype program pre-

sented to the Congress and now underway within the Military Departments is a specific example of this emphasis on hardware rather than paper. I believe that with hardware in hand, we will be vastly better able to make a good initial decision on production than is possible when that decision must be based solely upon contractor and military department estimates.

Secondly, I believe that we have made significant improvements in Department of Defense management and in our weapons system acquisition policies. In my statement last year I discussed some of these policies and the Deputy Secretary of Defense in his testimony to Congress amplified upon my statement. Very briefly in the acquisition process itself, we are placing increased emphasis on tradeoffs, completing development before production, and better testing before we make a production decision. We have first made a real improvement in the procedure for selecting and training our project managers. The Defense Systems Management School is established and has graduated its first class. The project managers now have increasing responsibility and authority, a more streamlined line of command within their military departments to the decision-makers, longer tour lengths which are tied to major program milestones, and are in a career that is appropriately recognized and rewarded.

The third factor is a basic cause of cost growth that has been most conspicuous in programs in the past. One of the primary reasons for cost growth has been the fact that we have asked for firm bids to produce something that had not been developed. Contractor bids were consistently low and the Department of Defense consistently accepted them without giving adequate consideration to the technical problems, program stretchouts and the cost growth normally associated with that particular type of program. The Department then implicitly put itself in the position of either being willing to see companies suffer major financial losses and possibly go into bankruptcy, or else agreeing to cover the actual costs in one way or another. We have done two things to meet this problem.

First, in looking at programs with very large cost growths, we found that data and techniques were or could have been reasonably available which would have indicated the final actual cost of a system within 10 to 20 percent, compared to the differences between the contractor's bid and the final cost which ranged to more than 200 percent in some cases. We will make more use of these types of estimating techniques in looking at future weapons systems programs so that we can have a better estimate of acquisition costs on which to base our decision.

To this end, I have established an OSD Cost Analysis Improvement Group to review the estimates presented and to develop uniform criteria to be used by all DOD units making parametric cost estimates. This group has representation from the Director, Defense Research and Engineering, and the Assistant Secretaries for Comptroller, Installation and Logistics and Systems Analysis. They will be responsive to the DSARC Chairman in assessing the reasonableness of cost estimates and the criteria followed in their development. At the same time, because valid cost estimates are so critical to a successful defense posture, I expect each Service Secretary to have

a staff component capable of preparing independent parametric cost estimates. Our goal is to have formalized procedures for program cost presentations, as well as uniform criteria to which future parametric cost analyses will be expected to conform.

Secondly, we have recognized that development by its nature is dealing with the unknown and wherever appropriate our contracts for development will be on a cost basis rather than of a fixed price type. This will help to minimize the problem of buying in and alleviate many of the problems contractors have faced in the past.

With regard to the fourth factor which has made things go wrong, we have established a better working relationship between industry and the Department of Defense. Industry's weakness in financial structure can inhibit both development capability and productivity, and can contribute to unnecessary costs of weapons acquisition. We must maintain a defense industry that is strong both technologically and financially. Defense profits have been a matter of interest and concern to industry, the Department of Defense, and the Congress. Great attention is normally given to those defense contractors whose profits seem to be excessive. Such industries I have found to be in the minority rather than being representative.

In fact, based on the most recent Renegotiation Board data, pre-tax profits as a percentage of sales have averaged about 2.55%. Based on this data, estimates would indicate that after-tax profits in the Defense industry are less than 1.3% of sales. Based on various studies, including a recent GAO study, it can be safely stated that profits measured either as a percentage of capital (both equity and total capital investment) or of sales, in the Defense industry, are well below profits realized from commercial ventures. It is in the interest of the nation to assure a strong defense industry. I am convinced that only through a strong defense industry can we both obtain the weapons that we need and obtain them at the lowest overall cost to the taxpayer.

We have worked closely with the General Accounting Office this year in taking action to meet legitimate concerns on defense profit levels in two different areas. First, we now permit contractors to collect interest on claims when these claims are honored. It seems a matter of simple equity that in those cases where the government incurs an obligation and the payment is delayed, the contractor should not be expected to finance this obligation during the time it is in dispute. Secondly, we have established a contractual procedure which will recognize the contractor's capital investment in arriving at profits. There has been great interest on the part of the General Accounting Office and the Congress in this recognition of capital. We are proceeding slowly and carefully with this new procedure, so that we can better understand how and when it should be applied.

Two significant changes have also been made with respect to progress payments on contracts. First, a uniform policy has been promulgated on the frequency and timing of progress payments. Second,

in the future, progress payments will be made for costs paid by the contractor, rather than for costs incurred as has been the basis in the past. This latter change will provide an increased incentive for the prime contractor to pay material supplies and other sub-contractors more promptly. It will also, of course, somewhat increase the requirement for private financing of operating expenses by the contractors.

All of these improvements together will not accomplish the full level of improvements we seek in improving the weapons systems acquisition process. We need to do more and will continue to search for appropriate new techniques to accomplish our aims. For instance, we are not yet convinced that we have established the proper incentives for the elimination of marginal requirements that needlessly increase acquisition -- and operating -- costs with little performance benefits. We are not convinced we have established sufficient competitive incentives toward economy and simplicity in design and operation. There will probably never be a "final report" on reaching perfection in Weapon Systems Acquisition. However, this Administration intends to continue to provide substantive "progress reports" indicating our efforts in this direction. We are hopeful that the Congress will continue to help us, as they have done in the past, in this difficult task.

F–15 FIGHTER

Secretary LAIRD. Now, is it my understanding that you want to have a discussion at this point on the aircraft carrier?

Chairman ELLENDER. I would like to ask a question with respect to the Air Force's F–15 fighter. The budget includes about $450 million for the procurement of the first 30 operational aircraft. Do you think the R. & D. program has progressed to the point that justifies you requesting funds for the production of operational aircraft?

Secretary LAIRD. Yes, Mr. Chairman. I think that program has moved along very well. Both the F–15 and the B–1 are programs where we have used our new approach as far as procurement is concerned.

Now, for the F–15, we have a very important decision to make in October. At this point, perhaps I could describe for you the forthcoming milestones on the F–15.

(The information follows:)

The table below is from the latest F–15 Development Concept Paper and lists the Demonstration Milestones the Air Force will brief to each DSARC. Four DSARCs are planned, as shown, thus giving a conservatively phased release of production commitments. The details of the Demonstration Milestones are defined in the contract.

EVENT	Approximate Demonstration Milestone Dates 1/	Plng Date OSD Decision Point
A. DEVELOPMENTAL GO-AHEAD		Dec 69
1. Preliminary Design Review	Sep 70*	
2. Radar Contractor Selected	Sep 70*	
3. Critical Design Review (Air Vehicle)	Apr 71*	
4. Avionics Equipment Development Review	Jun 71*	
5. Struct Test - Major Airframe Subassemblies	Jun 72	
6. Engine Preliminary Flt Rating Test (PFRT)	Feb 72	
7. Engine/Inlet Compatibility Tests (AEDC)	Mar 72	
8. First Flight	Jul 72	
9. Bench Avionics Integration Complete	Sep 72	
10. Initial Aircraft Performance Demonstration	Sep 72	
B. LONG LEAD RELEASE (U/E AIRCRAFT)		Oct 72
11. Initial Airborne Avionics Performance	Dec 72	
12. Fatigue Test - One Lifetime	Jan 73	
13. Static Test - Two Critical Conditions	Jan 73	
14. Engine Military Qualification Test (MQT)	Feb 73	
C. FIRST WING RELEASE		Feb 73
15. Armament Ground Test	Jun 73	
16. One (1) G Flight Envelope	Aug 73	
17. Fatigue Test - Three Lifetimes	Dec 73	
18. AF Performance Summary Evaluation	Dec 73	
D. RELEASE RATE TOOLING		Jan 74
19. Equipment Qualified	Mar 74	
20. Cat II Test Aircraft and Equip in Place	Mar 74	
21. Training Equipment in Place	May 74	
22. Fatigue Test - Four Lifetimes	Oct 74	
23. External Stores Flutter Release	Aug 74	
24. AGE Equipment in Place	Oct 74	
25. Cat I Flight Tests Essentially Complete	Nov 74	
26. First Aircraft to TAC	Nov 74	
E. SECOND WING RELEASE		Dec 74

1/ These dates are planning estimates as of Dec 1969 for reference, updated to reflect implementation of the USAF/SAB recommended increase to F-15 fatigue spectrum specifications. OSD threshold controls apply only to the last column. * = Milestone completed

TABLE 2 - OSD PROGRAM DECISION POINTS/A.F. DEMONSTRATION MILESTONES

1 Sept 1971

CONTRACT PROVISION OF DECISION DATE

Secretary LAIRD. When we have to decide on procurement on the first wing, next February, we will have 120 hours of flying time on the F–15.

Mr. Chairman, in all frankness, I think in future contracts I will recommend, and see that it is carried out, that we have more flying hours before the date for that particular decision.

Chairman ELLENDER. Why can't you extend it for the F–15?

Secretary LAIRD. Because of the contract provisions, the milestones are set. We did agree in that contract to a decision date that is scheduled to come after 120 hours of flight testing.

Perhaps, now in retrospect, I think I would now insist on more hours. But this is the first major contract under our new procurement policy and procedure which Dave Packard and I have put into effect in the Department of Defense, and this contract, I think, is a great improvement over the total package procurement concept used in the past.

I just want to tell you frankly that I think in the future more hours are needed before that kind of decision should be approved.

Chairman ELLENDER. I thought that, in keeping with your fly-before-you-buy concept, the plane would be thoroughly tested before a production decision.

Secretary LAIRD. I think an argument can be made that 120 hours of flying time is not enough. I am just being frank with this committee. I feel that in the future we should probably insist upon more hours of flying than is provided for in this contract. But that program is still based on the fly-before-you-buy principle and it is applied there and the decision on the release of long leadtime funds for the first procurement is due in October. The first production aircraft, as far as the F–15 is concerned is now scheduled to be delivered in November 1974.

Chairman ELLENDER. Under your contract, if the 120 hours of flying has convinced you that the airplane is satisfactory——

Secretary LAIRD. We will make the decision to go forward at that particular point in time. That is only one decision point. All the way down the line we have these decision points in this contract.

FIRST PRODUCTION

Chairman ELLENDER. What decision must be made in October after the aircraft has been flown 120 hours?

Secretary LAIRD. That is to go forward with the production approval to buy 30 production aircraft.

TOTAL PROGRAM

Chairman ELLENDER. How many will be needed altogether?

Secretary LAIRD. In the total lifetime of the program?

Chairman ELLENDER. Yes.

Secretary LAIRD. In the total lifetime of the program, if it is carried out fully and all of these dates are met, the Air Force now plans procurement of 729 aircraft (excluding R. & D. aircraft). For the first wing, which we will be deciding upon in February, we need 129 aircraft.

Chairman ELLENDER. You said you need 129 aircraft for the first wing, but you are requesting funds for only 30. Are the 30 based on the contractor's production capability?

Secretary LAIRD. Well, our production contract is based on a slow initial production buildup. That is the basis for the 30 aircraft in the fiscal 1973 buy.

Chairman ELLENDER. Does your production contract include options for the additional aircraft?

Secretary LAIRD. Yes, we have those options, though, at different stages of the contract.

Chairman ELLENDER. At the same price?

Secretary LAIRD. Under the current contract plan the contract provides for economic escalation during the production period that would be included in the cost.

Chairman ELLENDER. That is unlike the F–14 contract?

Secretary LAIRD. Yes, this contract is unlike the F–14 contract.

Admiral MOORER. The aircraft would be procured in lots, Mr. Chairman; and each time we would have an option to buy additional lots at an agreed price.

PENDING AUTHORIZATION LEGISLATION

Senator YOUNG. May I ask how many are authorized?

Secretary LAIRD. We are asking to procure 30 aircraft.

Senator YOUNG. In the bill pending?

Secretary LAIRD. And the decision would be made in February after 120 hours of flying of this aircraft. If it works out satisfactorily, we can go forward and go into production on the 30 aircraft.

Senator YOUNG. That is what you are asking the Armed Services Committee for now?

Secretary LAIRD. That is correct.

OPERATIONAL AND RESEARCH AIRCRAFT

Chairman ELLENDER. These 30 would be operational aircraft?

Secretary LAIRD. That is correct.

Chairman ELLENDER. They would go into your inventory?

Secretary LAIRD. Yes.

Admiral MOORER. Yes, sir.

Secretary LAIRD. There are 20 R. & D. aircraft earlier in the program and these 30 would be production aircraft.

Admiral MOORER. To answer the question, "do the production aircraft go into operation," the answer is, "Yes."

Chairman ELLENDER. What about the 20?

Admiral MOORER. Some of the 20 will be modified later to a production configuration, and some will be retained in the test program.

POSSIBLE MODIFICATION COSTS

Chairman ELLENDER. Under your contract, suppose you find some defects in the 30 you are buying, and they don't fly according to your expectations. What then?

Secretary LAIRD. Then the decision date for additional aircraft could be postponed. If they are satisfactory, we would go ahead.

Chairman ELLENDER. I am talking about the 30 you are going to buy.

Secretary LAIRD. Then you wouldn't go with the next lot.

Chairman ELLENDER. There would be no additional cost to you?

Secretary LAIRD. Not until that was corrected.

Chairman ELLENDER. Who would bear the expenses of that correction?

Secretary LAIRD. Did you mean correction of a flaw in the 30 aircraft?

Chairman ELLENDER. I understand that you take care of the inflation in your contract, but suppose that some defect should develop in those 30, one or two or three of them——

Secretary LAIRD. If it were not the contractor's fault, we would bear the cost.

Chairman ELLENDER. In other words, if you made some modifications in the aircraft you would bear the cost?

Secretary LAIRD. That is correct.

F–14 CONTRACT

Chairman ELLENDER. With respect to the F–14 contract the contractor is obligated to deliver aircraft at a fixed price?

Secretary LAIRD. Yes, sir. That is a fixed price contract.

Chairman ELLENDER. The fiscal year 1973 request of about $570 million is based on the procurement of 48 aircraft under the terms of the existing contract—I think we refer to these 48 aircraft as lot V. It is my understanding that the contractor has stated that he will not produce these aircraft in accordance with the contract option. What is your position on this matter, Mr. Secretary?

Secretary LAIRD. We have not yet exercised that option, which will not come up until October, but my position is that if we exercise that option we have a valid and legal contract.

Chairman ELLENDER. Well, you are asking for the money here to exercise that option.

Secretary LAIRD. Yes, but it is not until next October that that option comes up, but that is a different type of contract, Mr. Chairman.

Chairman ELLENDER. I understand.

Secretary LAIRD. We have a fixed price contract as far as Grumman is concerned. This is a different type of procurement contract.

Chairman ELLENDER. I am not trying to compare the contracts. I am just saying that for the 48 you are asking more money for, although Grumman has indicated that it will build them for the prices agreed upon.

Secretary LAIRD. I understand that they have sent the Navy a letter to that effect, but my position is that we have a valid and legal contract with Grumman.

As stated in my defense report, we take the position that we have a valid and legal contract with the Grumman Aircraft Corporation.

The prime contractor for the F–14 aircraft has formally communicated to the Navy a statement that the contractor considers contract options beyond lot 4 unacceptable without contract restructuring.

Although Grumman has notified the Navy, their letter has no legal status as far as the contract is concerned.

This is a complex matter, as you know. In my opinion, it would not be in the best interest of the Government for me to speculate on what the Government's position might be on specific contractual terms should the decision be made to attempt to restructure the contract, which is only one of several courses of action which might be open to the Government.

Chairman ELLENDER. Suppose you exercise the option and they refuse to produce the aircraft. What is your next step?

Secretary LAIRD. Well, the next step is contract enforcement and that is done through legal means.

Chairman ELLENDER. If Grumman went through with the contract which they are obligated to perform, it would conceivably be another Lockheed problem.

Secretary LAIRD. Mr. Chairman, I don't know that yet, and I am not in a position where I have to make a decision down the line and I am not going to take that position.

Chairman ELLENDER. I am not saying you will. I presume you are as well aware as I of the implications.

You feel now that you will be able to have them comply with the contract for the 48 aircraft? That is your position?

Secretary LAIRD. That is my position. That is the position I take as Secretary of Defense, that we have a firm contract as far as lot 5 is concerned.

AIRCRAFT TEST AND CAPABILITY

Admiral MOORER. The problem with the F–14 is with the contract procurement and not with the performance of the aircraft. The tests have been going in an excellent fashion.

As a matter of fact, 2 weeks ago today we had a very successful look-down shoot-down test in which the aircraft was at a high altitude shooting at a target below. It is the only aircraft in the world that has that capability.

ENGINE SELECTION

Chairman ELLENDER. There are some that contend that we should defer production of the F–14 aircraft until the new technology engine is available. That is, stop production until we can obtain the F–14B aircraft. Is this a feasible proposal?

Admiral MOORER. Sir, the original plan was to use the "advanced technology engine," which is still feasible. I think the current engine, though, has developed more thrust than its original design and the Navy is looking at the alternative of staying with the F–14A engine.

I am sure the growth potential of the airplane is such that it can be fitted with the better powerplant.

AIRCRAFT INDUSTRY EMPLOYEE WAGE INCREASE

Senator YOUNG. May I ask a question? Weren't the aircraft workers given a 12-percent increase? This is higher than that in other industries. What is the reason they were granted a higher increase than other industrial workers received?

Secretary LAIRD. The Price Board did give a higher increase because the contract negotiations had gone on for a longer period of time. They justified the higher increase above their guidelines because the negotiations had been going on for a longer period of time.

LOT 5 AIRCRAFT CONTRACT COST

Chairman ELLENDER. What is the fixed price contract for that aircraft?

Secretary LAIRD. The total cost of the aircraft for lot 5?

Chairman ELLENDER. Yes.

Secretary LAIRD. We are asking for funding of $483.5 million for fiscal year 1973. Of course, the thing that is in dispute with Grumman is that they feel their costs, even in 1973 and 1974, are much higher than the contract ceiling price.

Chairman ELLENDER. I note that the $483.5 million includes $75.7 million for advance procurement to support the planned fiscal year 1974 buy of F–14's. The 48 aircraft requested for fiscal year 1973 is based on a total cost of $492.6 million, which is offset by advance procurement in the amount of $84.8 million for a net requirement of $407.8. This is a unit cost of about $10.3 million.

Secretary LAIRD. That is correct.

Chairman ELLENDER. As I recall the F–14 contract was awarded early in 1969.

Secretary LAIRD. It was the last major contract announced before I became Secretary of Defense. The contractor was selected prior to January 1969 and the award was announced on the 19th day of January 1969.

AIRCRAFT PERFORMANCE

Chairman ELLENDER. It was unfortunate that the first of the F–14 test aircraft was lost. How is the flight testing program progressing?

Secretary LAIRD. They are performing well in tests. As Admiral Moorer reported, we had a very successful test 2 weeks ago.

DELIVERY SCHEDULE

Chairman ELLENDER. How many test aircraft have been delivered?

Secretary LAIRD. I think we have nine delivered. May I check that? I have the delivery schedule here, Mr. Chairman.

We have nine at the moment. There will be three more delivered in the third quarter of fiscal year 1972, and a total of 16 deliveries by July 1, 1973.

Chairman ELLENDER. This is the total number delivered?

Secretary LAIRD. There are nine delivered through January 1972. There will be four deliveries in the third quarter—the current quarter—and then in the remaining portion of fiscal year 1972 there will be three. It makes a total of 16 through fiscal year 1972, but that does include two that were delivered in fiscal year 1971.

Chairman ELLENDER. Your budget request relates to which lot?

Admiral MOORER. The 48 aircraft in the budget that we are considering are in the fifth lot, I believe.

Chairman ELLENDER. What is the current status of the 74 production aircraft funded in fiscal years 1971 and 1972? I think they are referred to as lots 3 and 4.

Secretary LAIRD. Lots 3 and 4, the first production aircraft, have not been delivered yet, Mr. Chairman.

Admiral MOORER. They are not delivered, but they will be operational aircraft.

Secretary LAIRD. I can give you the delivery dates. Should we put the delivery dates right in the record at this point?

Chairman ELLENDER. I wish you would.

I wouldn't include anything that would in any manner affect your bargaining power for the 48, but I think we ought to be specific as to these lots. You said that this is the fifth lot you are ordering.

Secretary LAIRD. There are 12 R. & D. aircraft, and they comprise lots 1 and 2. In fiscal 1971 there were 26 aircraft in lot 3, and then 48 in fiscal 1972 in lot 4, and 48 aircraft—lot 5—in fiscal 1973.

Now, I can give you the delivery dates that you have asked about, if you wish, but those are the five lots of development and production aircraft up through the fiscal 1973 buy.

Chairman ELLENDER. Include the number.

Secretary LAIRD. But the delivery dates are different from the funding dates for these lots. I can put that into the record.

DELIVERED AND OPERATIONAL AIRCRAFT

Chairman ELLENDER. How many, actually, have been delivered?

Secretary LAIRD. At the present time, as of January 1, nine have been delivered. As you know, Mr. Chairman, one of those was lost. We had a crash.

Chairman ELLENDER. The loss of that aircraft was most unfortunate.

Secretary LAIRD. Nine as of January 1. Then in the first two lots, which included the 12 R. & D. funded aircraft, the last three of those will be delivered in the third quarter of fiscal year 1972, this current quarter.

Chairman ELLENDER. On the order of 12?

Secretary LAIRD. Those were the R.D.T. & E. funded aircraft—that were authorized. Then of the next group that was authorized—the lot 3 planes—four of these will be delivered in the third and fourth quarter fiscal 1972. Then in the first quarter of fiscal 1973 10 will be delivered and in the second quarter 12 more.

That is in the group of 26 that was approved in the fiscal 1971 budget. Now, in the fiscal 1972 budget, 48 were approved. Twelve of those will be delivered in the third quarter of fiscal year 1973, 12 in the fourth quarter of fiscal year 1973, 12 in the first quarter of fiscal year 1974, and 12 in the second quarter of fiscal year 1974.

Now, in the group for which we are requesting funding in this bill in fiscal year 1973, 12 of those will be delivered in the third quarter of fiscal year 1974, 12 in the fourth quarter of fiscal year 1974, and [deleted] of them will be delivered in fiscal year 1975.

Chairman ELLENDER. With respect to the R. & D. and production aircraft included in lots 1 through 4, it is my understanding that Grumman is producing those aircraft in accordance with the contract terms.

Secretary LAIRD. They have to date.

They insist they are losing money on these deliveries.

F–14 AND F–15 AIRCRAFT FUNDING AND DELIVERY DATES

Chairman ELLENDER. I think the record is plain. If you want to put in the record anything else, you may.

Secretary LAIRD. I think it would be well to put the tables on the F–15 and F–14 in the record, because the funding dates are different from the delivery dates.

(The tables follow:)

F–14A AIRCRAFT DELIVERY PLAN

Procurement year	Quantity	Fiscal year—																
		1971 and prior	1972				1973				1974				1975	1976	1977
			1	2	3	4	1	2	3	4	1	2	3	4			
Fiscal year 1970 and prior	12	2	2	5	3										[Deleted.]		
Fiscal year 1971	26				1	3	10	12									
Fiscal year 1972	48								12	12	12	12					
Fiscal year 1973	48												12	12			
Fiscal year 1974	88																
Fiscal year 1975	91																
Total	313																

F–15 AIRCRAFT DELIVERY PLAN

Procurement year	Quantity	Fiscal year—																
		1971 and prior	1972				1973				1974				1975	1976	1977	Beyond
			1	2	3	4	1	2	3	4	1	2	3	4				
Fiscal year 1972 and prior	20	0	0	0	0	0	2	1	2	2	3	2	1	3	4			
Fiscal year 1973	30														21	9		
Fiscal year 1974	77															77		
Fiscal year 1975	[deleted.]																[Deleted.]	
Fiscal year 1976																		
Fiscal year 1977																		
Balance																		
Total	749																	

AIRCRAFT CARRIERS

Secretary LAIRD. Let me now turn to aircraft carriers. At the end of fiscal year 1973, the aircraft carrier force will consist of nine *Forrestal* class or larger, including the nuclear powered *Enterprise*, plus three *Midway* class and four older carriers. The average age of the current carrier force is now over 18 years, with two ships now over 28 years old. Two nuclear powered carriers, *Nimitz* and *Dwight D. Eisenhower*, are under construction and are scheduled for commissioning in 1973 and 1975. The carriers will be ready for operational deployment about 1 year after commissioning.

NUCLEAR-POWERED CARRIER CONSTRUCTION: CVN–70

As I stated last year, I am convinced that our responsibilities in the Atlantic, the Pacific, the Mediterranean and other ocean areas require that we proceed now with the construction of an additional nuclear-powered carrier for the Navy to insure adequate aircraft carrier capabilities for the 1980's and beyond. The CVN–70 is needed to continue the modernization of our sea-based tactical air forces; it will replace an old conventional carrier.

ESTIMATED COST

We are requesting $299 million in fiscal year 1973 to procure long leadtime items for CVN–70, which the Navy currently estimates will cost almost $1 billion. The Navy will give details on its current cost estimate in its presentations to the Congress. This carrier, along with the U.S.S. *Enterprise* and the two others currently under construction would provide us with four nuclear carriers, enabling us to operate two on each coast.

FORCE MAINTENANCE

Chairman ELLENDER. It is my understanding that the current plan calls for a force of [deleted] carriers during the fiscal year 1974–77 period.

Secretary LAIRD. Modern aircraft carriers.

Chairman ELLENDER. Yesterday I referred to the modernization of the *Midway* as an example of what can be done toward modernizing our carrier force, without spending $1 billion for a new carrier.

Is it your opinion that is not feasible to consider modernization of some of the older carriers in order to obtain this desired force of [deleted] modern carriers?

Secretary LAIRD. Yes, Mr. Chairman, that is my opinion. I have studied this very carefully. I believe that going from a 17 carrier force down to the [deleted] carrier force that is projected in this 5-year defense plan is as far as we should go in the reduction of the carrier force.

Chairman ELLENDER. This carrier would be delivered, if everything goes well, when?

Secretary LAIRD. The actual delivery date, if everything goes well, will be in the 1980 period.

Destroyer and Nuclear Attack Carrier Programs

Chairman Ellender. Do you contemplate asking for funds to construct frigates or other ships in order to protect this new carrier?

Secretary Laird. We do not have any new nuclear frigates in this budget request. We do have funds for the destroyer program included in this request.

Mr. Chairman, when you get into the ship construction program, I have carefully considered the priorities in that program, I have recommended to the Congress and this has been approved by the President and submitted in the budget request—six of the nuclear attack submarines. With those, together with the start of the ULMS program and the nuclear carrier in this budget—I felt that was as far as we could go.

Nuclear Frigates

Now, Senator Pastore asked me a question yesterday. He wanted to know if this committee in its wisdom added money for the nuclear frigates whether I would proceed with the nuclear frigates.

I can assure you there is a need in the Navy for additional new modern ships. I certainly would move forward with that program.

But in putting together the overall budget, there is a limit on how far you can go in this ship construction program.

When you are talking about ships which, if they are authorized today won't come into the inventory until about 5 or 6 years from now, I think we are going very well on this budget.

Balanced Ship Construction Program

If this Congress authorizes this ship construction program we are asking for, I think it will be most generous.

I don't share the concern the Chief of Naval Operations expressed to you the other day about those decisions that were made in 1962, 1963, 1964, 1965, and 1966 and if you are looking at where we are in 1972, you have to go back to the mid-1960's and look at those decisions. I happened to be setting on the Defense Appropriations Subcommittee in the House, and I was a part of those decisions. I am not going to go back and be critical of the Appropriations or Armed Services Committees for those decisions made in those particular years because I was a part of that decisionmaking process.

I know just as well as the Chief of Naval Operations, that it takes around 5 to 6 years from the time you authorize a shipbuilding program, until the ship is operational, but I recognize that Congress is a coequal branch of the Government, with just as much responsibility for national security as the executive branch—whether it be ship construction, Air Force modernization, or Army modernization.

I believe that this ship construction program we are offering to you for 1973 is a balanced program.

And since I have been Secretary of Defense, in fiscal year 1973, we have tripled the ship construction budget as far as the Navy is concerned when compared with the ship construction budget that was in existence in fiscal year 1969, at the time I became Secretary of Defense.

So I don't take any second place or have any second thoughts or misgivings about the recommendations I have made to this committee in the ship construction field.

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I do want to say, however, that we can improve our management in the area of ship construction. I discussed this in my Defense report, and I would like to insert a short passage, together with an elaboration of the kinds of problems we have faced in the shipbuilding area in the past.

(The information follows:)

A final area of major concern is the Navy Shipbuilding Program. I have recommended and strongly support a Shipbuilding and Conversion program of $3.6 billion for FY 1973. I have described in some detail the objectives of our Strategy of Realistic Deterrence, the threats that we face in reaching these objectives, and our great need for improving and modernizing our naval forces. Despite this urgent need, I cannot and will not accept the serious inefficiencies that we have earlier observed in our shipbuilding program. We need a modern and efficient Navy and we need to procure and operate it in an efficient way. I assure you that I will give equal attention to both of these needs.

By serious inefficiencies, I refer to the several problems which contribute to higher costs and longer building periods which we have experienced in recent years. Each of the weaknesses in Navy's shipbuilding management system contributes in varying degree to the inefficiency.

Specifically, I mean:

Inadequate planning for the early, firm definition of ships.

Funding of developmental systems and experimental ships under the Shipbuilding and Conversion, Navy appropriation.

Inadequacy of specifications, control of change orders and early anticipation of claims.

Lack of adequate management information and cost control systems for Ship Acquisition Project Managers.

Unsuccessful control of naval shipyard new construction and conversion work.

Failure always to balance program decisions with their cost impacts.

Inability to forecast accurately for two to five years economic conditions in the shipbuilding industry.

NUCLEAR CARRIER

Chairman ELLENDER. Mr. Secretary, I am sure that no member of this committee meant to imply that you have not supported an adequate shipbuilding program for the Navy.

I feel that the $299 million being requested for the long-leadtime items for the third nuclear-carrier of the *Nimitz* class is going to be one of the most controversial issues in the Department of Defense budget for fiscal year 1973. With the decision to reduce the number of carriers from 17 to [deleted] the need for this expensive ship is certainly subject to discussion. It is my purpose to develop a complete record on the issues involved.

REQUIREMENT FOR ESCORT SHIPS

We all know that when we deploy a carrier there is a requirement for escort ships and supporting ships. There are many that contend that the escort ships must be nuclear powered in order to obtain the full effectiveness of the nuclear powered carrier.

I realize that the pending budget does not include funds for the construction of any of the nuclear powered frigates that cost about $250 million each. However, isn't it likely that future budgets will include funds for these expensive frigates to escort this new carrier?

Secretary LAIRD. I would like the chairman to comment on that, if he would.

Admiral MOORER. Mr. Chairman, when a task force is assembled for a certain mission, for instance such as the *Enterprise* cruise in the Indian Ocean before Christmas, the ships that are used along with the carrier do not necessarily have to be nuclear. As a matter of fact, one of the biggest assets of the nuclear powered carrier is that the space

normally used for carrying its own fuel carries fuel for the other ships in the force.

So I wouldn't want to give the impression that every time a nuclear carrier makes a cruise it must have all the nuclear ships with it. That is not the case at all.

So, in your programing you don't include nuclear powered frigates just because you have a nuclear carrier in the program.

This nuclear carrier which is in this program will greatly enhance the capability of the Navy without the frigates. The frigates, as the Secretary of Defense says, would also add to the overall capability, obviously, but the point I want to make is that the utility of this ship is not determined by the presence of the frigates.

I wouldn't say that if you had this ship, then you would have to buy four frigates to go with it. This is not the case.

DD–963-Class Destroyers

Secretary Laird. Mr. Chairman, I would want to point out that we do have before you today funding in this budget request for construction of additional DD–963-class destroyers.

Chairman Ellender. How many altogether?

Secretary Laird. As you know, Mr. Chairman, we have programed at the present time 30 new DD–963 destroyers. Sixteen of these ships have already been funded by this committee, and the 1973 budget includes $612 million to procure seven more of these DD-963 destroyers. We now plan to procure the last of the 963 destroyers in 1974.

Modernization of Guided Missile Frigates

In addition, the 1973 budget request includes $110 million to modernize two more guided missile frigates (DLG's). I think that should be pointed out.

Senator Case. Would you repeat what you said about the frigates?

Secretary Laird. We have $110 million to modernize two more guided missile frigates in this particular budget.

Senator Case. They are not nuclear?

Secretary Laird. No; but in addition to those we also have $30 million of advance procurement funds in the budget for modernization of a nuclear frigate.

Senator Case. What the chairman is after are the facts so that when somebody says the whole cost of a strike force would be much greater, we have to have the answer to that. That is what we are looking for here.

DLGN–38-Class Nuclear Frigate Construction

Secretary Laird. I understand that, but I think it should be pointed out, too, Senator Case, that the Navy is also proceeding with the construction of three new DLGN–38-class nuclear frigates which will be equipped with both antiaircraft and antisubmarine warfare weapons. These ships have already been funded and are to be constructed on a multiyear contract.

For example, if one assumes, which I do not, that procurement of a nuclear carrier would require procurement of four new nuclear escorts, new replenishment ships, five escorts for the replenishment ships, and

new aircraft—including F–14's—the 10-year procurement cost would amount to about $2.6 billion. The 10-year operating cost for such a force including the replenishment ships and escorts, would be about $2.9 billion for a total of about $5.5 billion in 1972 dollars. Since the expected lifetime of a naval ship is about 30 years, only one-third of the ship procurement cost has been included in the 10-year procurement costs shown above.

This total figure of $5.5 billion represents an estimated cost if you had to invest in a typical full carrier task force, if it were procured and operated today as an addition to the Navy, configured as described above. However, I would note that the use of a typical carrier task force can be misleading, in the sense that task force configuration depends upon many factors. For example, it is not valid to assume that construction of a nuclear carrier requires the construction of four nuclear escorts for this carrier.

The Congress has approved those and that ship construction is going forward at this time. I would like to explain, Senator, that if you sat down and looked at the procurement and operating costs of a full carrier task force, it's a substantial sum, there's no doubt about that.

Frigate Mission

Senator Case. A frigate has more uses than just the protection of a carrier, does it not?

Admiral Moorer. Yes, sir; for example, gunfire support, antisubmarine operations, and escort of the merchant ships. It has many tasks other than escorting the carrier.

Even when it is with the carrier, it is frequently detached from the task force and sent off for additional missions around the periphery of the operation, Senator Case. I think I have probably commanded more task forces than anyone on active duty today, and I feel I am very familiar with this type of operation.

You are quite right in saying that the frigate just doesn't hover around the aircraft carrier. It can be used as it is in the Tonkin Gulf, for instance, today.

So, it has nothing to do with the carrier per se.

It also has the capability of controlling fighter aircraft so the carrier, which may be 150 miles away, can send these fighters over to report to the frigate, which, in turn, can then direct the fighters to intercept any enemy aircraft in the vicinity.

The big advantage of the nuclear frigate is simply that the task force commander has the latitude and flexiblity which permits him to send the frigate on independent assignments two, three, or four hundred miles way from the main force without having to concern himself with sending a tanker out to refuel it.

Carrier Vulnerability

Senator Case. I think the heart of the concern is vulnerability of the carrier. That was discussed at some length by Admiral Zumwalt. He pointed out the success of the *Enterprise*, absorbing six explosions and still remaining 50 percent battle effective, as I remember, and the damage was repaired very quickly.

I think this is splendid, but wasn't the *Hood* sunk with a single shot down the funnel?

Admiral MOORER. I am not sure about that, sir. I can only go back to the experience we had in World War II with Kamikazes and torpedoes. I wouldn't suggest for one minute that a ship at sea can't be sunk. But I can say, in talking about vulnerability, that it is relative. In other words, you have to look at the vulnerability of this particular unit as opposed to the vulnerability of some other unit that performs the same function. Secondly, I would look at it in terms of nuclear war on the one hand and conventional war on the other.

Obviously, I don't think there is anyone who wouldn't accept the fact that if a nuclear weapon hits a carrier or ship a small city or a military base, that target is going to be destroyed.

On the other hand, I think you have to bear in mind that the aircraft is, first, very mobile. It is not a suitable target for a ballistic type missile which goes from point to point. It must have some type of terminal control to attack a moving target.

CARRIER DEFENSE TACTICS

Second, the aircraft carrier, with the F–14, can shoot down cruise missiles which the Soviets have in their surface ships and their submarines. The defensive tactics are such that you have these frigates and even submarines out on the periphery of the area in which they are operating, both adding to the strength of the carrier defense.

STRUCTURAL ADVANTAGES

Also from a structural point of view, of course, the carrier is designed in such a way that it is heavily compartmented below the water line. In my view, the carrier can accept conventional hits and still continue.

Our experience in World War II was that we didn't lose a carrier that was built following Pearl Harbor. We did lose the *Hornet*, as you will recall, and the *Wasp*, and a converted ship, the old *Lexington*, primarily because of a defect in the fuel system, but that was all corrected.

During World War II, when the carriers were hit heavily with conventional weapons, none of the carriers with the modern system was sunk.

So I would not suggest that the carriers couldn't be hit, or they wouldn't be damaged. But I have to say that if the carrier is unable to live on the surface of the ocean, then no other surface ship could live on the surface of the ocean.

ECONOMIC EFFICENCY

Senator CASE. No other single ship could survive, but the question really is this: With the same money spent in some other way, you might get a more effective and even less vulnerable method of performing the roles which this great carrier is peculiarly designed to fill. For instance, I was thinking of close protection of an oil ship coming out from the Middle East as opposed to an open sea operation, where a much less expensive ship of the kind you are planning to have would do the trick.

Admiral MOORER. Yes, sir. If you are talking about the Middle East, perhaps the best way we could protect that type of operation would be with a carrier.

I think one reason why we have gone to the big carrier should be pointed out. In order to operate jet aircraft, it is necessary to have the electronics associated with the navigation, the safety, and so on, you may need only one set of this very expensive equipment. If you built a small ship with 50 aircraft on it, you would need the same amount of this type equipment as a ship with 100 aircraft on it. You cut down on this cost in the larger ship. The same thing is true for the maintenance equipment and spare parts. It is just as easy to have the maintenance equipment and spare parts storage for one aircraft of one type as it is for 10 of one type. So, when you get down to the support cost for aircraft, the bigger ship is more efficient.

Then, of course, you get to the point of how big should it be? We have concluded, based on our experience, that the *Enterprise* is the optimum. It has four catapults, which permits you to land aircraft and to take off at the same time.

During World War II, we frequently had attacks just when we were recovering the aircraft. In those days, we had to position all of the aircraft that were being recovered up in the bow and you couldn't launch, so you were stuck there while you were attacked. So these ships can do both simultaneously. That is why we have gone to a big ship for these sophisticated types of operations.

CARRIER-FRIGATE RATIO

Senator YOUNG. Mr. Chairman, the question arose in previous hearings that if we had more aircraft carriers, you would need more frigates. If I understood Secretary Chafee and Admiral Zumwalt correctly, they said it was just the opposite, that if we had fewer carriers, we would need more frigates. What is your opinion on that?

Admiral MOORER. I think what we were saying is that if you had fewer carriers and were opposing, for instance, the Soviet surface forces—which I am going to describe here soon—then obviously you would need some other means of opposing those forces if you didn't have the carriers. I presume that is what they were talking about.

Senator YOUNG. Then you are saying that if we build another aircraft carrier we wouldn't necessarily have to have more frigates?

Admiral MOORER. I think you would have to keep the frigate types we have today modernized. I wouldn't say we never have to have any more frigates.

We are going to have to build new ones or modernize the old ones. But you wouldn't necessarily have to increase the number for use with the carrier because this ship is not an increase in force level.

As the Secretary says, we have [deleted]. So the CVN–70 is not a means of increasing the number of carriers. It is intended to replace the old ones and the force levels are going down.

[Deleted.]

Senator YOUNG. During the period of deactivation can those same frigates be used with the new carrier?

Admiral MOORER. Yes.

Chairman ELLENDER. At the present time is the number of frigates and other escorts in the fleet and under construction adequate for the protection of a force of [deleted] carriers?

Admiral MOORER. We do have protection. I would tell you that the balance between the carriers and the frigates today is about right.

FRIGATE SIZE

Senator CASE. How big is a frigate?

Admiral MOORER. The new ones are really, in essence, what we used to call a small cruiser. They are the nuclear-powered frigates. Once you decide to build a nuclear-propelled surface ship that is required to go about 30 knots, the bulk of the nuclear plant is such that it takes the space of about a 9,000-ton ship to hold the propulsion plant.

You can build a much smaller nuclear ship if you are willing to accept a slower speed. But as long as you have a requirement for the 30 knots, then you are just about limited to a 9,000-or-more-ton ship.

Senator CASE. These powerplants are really conventional except that the heat is supplied by nuclear power?

Admiral MOORER. The nuclear reaction boils water. From then on you have steam and turbines and propellers just as in any other ship.

ADEQUACY OF CARRIER PROTECTION SHIPS

Chairman ELLENDER. If I understand you correctly, it is your position that the number of frigates and escorts in the fleet and under construction are sufficient to provide protection for this proposed new carrier and the others you will have in the planned force of [deleted] carriers?

Admiral MOORER. Yes, sir, I think so, in light of the other programs we have ongoing. This ship will not actually be operational, sir, until 1980 or 1981.

Chairman ELLENDER. In the meantime, though, more ships are under construction?

Admiral MOORER. Yes. As I pointed out, we also have the nuclear-powered frigates, the *South Carolina* and the *California* under construction, and are modernizing some of the missile-firing ships we already have . So, I still say that the balance between the frigates and carriers is about right, in my view. What I am saying is that the construction of this ship does not place a demand for additional frigates.

Chairman ELLENDER. All right. Any further questions on this?

SUBMISSION OF REPORT EXCERPT FOR RECORD

Secretary LAIRD. Mr. Chairman, yesterday I covered with you our approach to total force planning under the strategy of realistic deterrence.

I think it might be well to include in the record at this point the section of my defense report on total force planning in Europe, total force planning in Asia and total force planning and security assistance.

(The excerpt follows:)

1. Total Force Planning in Europe

Our general purpose theater force requirements are largely determined by planning for U.S. and allied conventional forces which will deter the Warsaw Pact nations from conventional attack of NATO Europe. We and our allies also must insure -- and display -- our ability to sustain and reinforce our deployed forces and those of our allies through control of the air and sea lanes.

Our force planning for NATO has been developed to implement our agreed strategy. In this regard, it is appropriate to note what the Defense Ministers stated in their communique of December 8, 1970:

> "Ministers confirmed the continued validity of the NATO strategy of flexibility in response, which includes forward defense, reinforcements of the flanks and capabilities for rapid mobilization, and calls for the maintenance of military capabilities which are able to provide an appropriate counter to any aggression. They noted the continuous rise in Soviet defense and defense-related expenditure and the evidence that the USSR is continuing to strengthen still further its military establishment, including that in the maritime field where Soviet power and the range of its activity have markedly increased. They, therefore, emphasize the need for improvements in NATO's conventional deterrent, as well as the maintenance of a sufficient and modern tactical and strategic nuclear deterrent.
>
> "The security of NATO being indivisible, Ministers underlined the special military and political role of North American forces present in Europe as an irreplaceable contribution to the common defense."

Our relationship with our NATO allies during this past year provides an excellent example of the Total Force Planning Concept at work.

a. NATO Planning in Perspective

You will recall that in the early stages of this Administration, we undertook an intensive review of our defense needs, deficiencies and policies in Europe. We also worked closely with the allies in a parallel study effort pertaining to NATO as a whole. From this comprehensive assessment and intense consultation with our Allies emerged the NATO Study on Alliance Defense Problems in the 1970's, known as AD-70.

In December 1970, the NATO Ministers approved this study at the Ministerial Meeting in Brussels, identifying the specific deficiencies in NATO's conventional defenses and establishing an action program of force improvements designed to reduce imbalances between NATO and Warsaw Pact conventional capabilities. At that same meeting, the European allies initiated the European Defense Improvement Program (EDIP) of about $1 billion of additional expenditures over the following five years, about half for improve-

ments to their own forces and the remainder for a program of aircraft survival measures consisting of the construction of aircraft shelters and related protective facilities. A large number of these shelters will be for U.S. aircraft but at about 30% of the cost in U.S. military construction funds, since there will be about 70% recoupment from EDIP funds.

At the December 1971 Ministerial Meeting, the Ministers assigned priority areas within the overall AD-70 program of force improvements for early action.

On December 7, just prior to the Ministerial Meeting, the Euro-Group Nations, which set up the special European Defense Improvement Plan in 1970 (UK, FRG, Belgium, Netherlands, Luxembourg, Italy, Norway, Denmark, Greece and Turkey), announced a combined total increase in their 1972 Defense Budget of over $1 billion, and identified significant improvements along AD-70 lines.

b. U. S. and Allied Cooperation in NATO

The past year has been one of considerable stability in Europe, and of the expansion of cooperation within the NATO alliance. The alliance defense effort has been put on its most solid footing in many years as a result of the NATO AD-70 efforts, the desire of the Europeans to show that they are definitely shouldering their part of the NATO defense burden, and our own efforts to restore the readiness of our forces in Europe.

That our efforts have been reasonably successful in the past year is, however, no reason for complacency. The common coordinated force improvements must be sustained, because we see no slackening of Warsaw Pact defense capabilities, but rather improvements.

On the whole, I am pleased with allied efforts to assume a greater role in the collective defense effort. In this connection, I want to make special mention of the two-year Offset Agreement just concluded with the Federal Republic of Germany in December in Brussels. This is another tangible example of the progress we have made toward achieving the President's goal of a greater sharing of the burdens of the alliance. I would like to call attention to one feature of that agreement in particular. The Federal Republic has embarked on an extensive program of 600 million Deutsch Marks (about $183 million) to refurbish at no cost to the U.S. the antiquated facilities in which our troops have been living. I have been personally concerned that everything be done to insure that our troops enjoy adequate living conditions.

1. Allied Improvement Efforts

The EDIP program announced by our Allies in December 1970 is being rapidly implemented. Over two-thirds of the total program of aircraft survival measures (i.e., shelters and other facilities) is already the subject of definite NATO programming or implementation action. Action on special national force improvements announced as a part of EDIP are also moving forward on schedule.

But the EDIP is only a small part of the European contribution to the Alliance. For the year 1972, almost all of our allies are planning increases in their defense budgets. As I noted earlier, at current prices the total planned increase for 1972 is well over $1 billion, without counting certain possible supplementary budget appropriations to meet further rises in costs. Our allies in the last few years have also taken important steps to modernize the structure and equipment of their forces. These steps are generally in consonance with the priorities established in the AD-70 study, and the allies are also engaged in reexamining and where necessary reshaping their ongoing defense programs to fit those priorities. They have important programs for the modernization of their forces.

Our allies have made clear that the maintenance of their force levels and their extensive improvement programs are worthwhile because of the continued U.S. commitment to NATO defense, given the high quality of U.S. forces, and the critical part they play in NATO defense plans. They have also made clear that efforts to achieve sufficient defense capabilities are a necessary precondition to realistic negotiations on security and cooperation in Europe.

2. Improvements to U.S. Forces in Europe

The U.S. is also making a strong effort to maintain and improve its forces in Europe. During the past five years, manpower shortages and personnel turnover have caused readiness problems for U.S. forces in Europe. In the past year we raised the priority of European forces for personnel, and the units are now at virtually 100% of authorized manning.

We plan to continue our FY 1973 force deployments to Europe at current levels, with minor adjustments as appropriate consistent with force modernization and improvement in efficiency of support components.

Modernization of the equipment of U.S. forces is also progressing well. In the first instance, we are making significant improvements in our anti-armor capabilities. The TOW anti-tank guided missile is being introduced in significant numbers now, and the smaller DRAGON missile will follow. We will soon introduce the M60A2 tank with stabilized guns and SHILLELAGH missile launchers with a new laser range finder. Our program to replace gasoline-drive armored personnel carriers with new and improved diesel models is nearing completion. We have almost completed modernization of the helicopter fleet and are equipping Army aviation units with new transports. We plan to deploy the LANCE missile to Europe as scheduled.

For our tactical air forces, we will complete conversion of F-100 aircraft to F-111 and F-4 in FY 1973. We have already built some 360 aircraft shelters and should finish the program with over 400 by the end of calendar 1972. We also hope to decrease force vulnerability by increasing the number of available dispersal bases and thus reduce wartime air base loading.

In addition to our own force improvements, both made and planned, we have offered recommendations to the allies for additional measures to bolster allied security. In the spring of 1971, we proposed certain new weaponry for NATO forces.

We further called upon the allies to take a greater role in coping with increasing Soviet naval capabilities in the Norwegian Sea and Mediterranean areas. We have also encouraged the allies to consider and suggest still other measures with which all of us might be able to further enhance our collective capability.

Another significant feature in allied defense planning is the work of the NATO Nuclear Planning Group. The activities of this Group, including the Ministerial sessions that I attend with my colleagues, represent one of the most important and valuable examples of Alliance cooperation.

At the two Ministerial sessions of the Nuclear Planning Group during the past year, I presented briefings on the balance of strategic forces, and shared in frank and useful exchanges with my colleagues on the implications for NATO of recent trends and developments in this area. The major field of work by the Nuclear Planning Group has been a continuing series of studies on the tactical use of nuclear weapons in defense of the Treaty area in support of the strategy of flexible response. A number of studies were completed during the past year, including one that German Minister of Defense Schmidt and I presented to the Nuclear Planning Group in October. These studies have given valuable insights into a critical area of NATO defense. This work program is expected to assist in the development of further guidance on the tactical use of nuclear weapons to augment the political guidelines for their use in defense of NATO approved in 1969. This effort will constitute a vitally important and challenging task for the Nuclear Planning Group in the months ahead.

c. Negotiations Aspects

Our NATO allies are clearly aware of President Nixon's program to move from confrontation into negotiation. At the December 1971 Ministerial meeting, the allies recognized the importance of maintaining our strength and partnership while moving toward detente, reaffirming the Alliance position that its overall military capability should not be reduced except in the context of mutual and balanced force reductions. For our part, we reaffirmed the U.S. position that, given a similar approach by the other allies, the United States would maintain and improve its forces in Europe and would not reduce them except in the context of reciprocal East-West action.

We are working closely with our NATO allies in preparing for possible negotiations on mutual and balanced force reductions (MBFR) in Europe. Over the past year our Government submitted to NATO three major studies on this subject, and we intend to submit the results of future studies as they become available. Only by working closely together can we insure that allied solidarity is preserved.

Our objective, as we move forward with our Allies in developing positions on MBFR, is the maintenance of Alliance security, with a more stable military balance at lower levels of forces. We are considering MBFR in a comprehensive manner, focusing on a combination of reductions, collateral constraints (such as limitations on exer-

cises), and verification provisions. We have concluded that NATO force improvements and MBFR must complement each other; we will need to move forward with force improvements before, during, and after MBFR negotiations.

We are confident that our efforts will ensure that we are thoroughly prepared for MBFR negotiations at such a time as they can be brought about. In this regard, Allied Ministers have invited the Warsaw Pact to hold exploratory talks on MBFR, and Mr. Manlio Brosio has been appointed and given a mandate to explore this subject. Although the USSR and the Pact have failed to date to respond to these NATO initiatives, we and our allies remain prepared to discuss MBFR should they see fit to respond.

d. Summary

Clearly, the year 1971 has been a year of progress in working together with our European Allies in maintaining and improving our own and allied forces to meet the common threat and to share the common defense burdens more equitably. The historic decisions of the December 1970 Ministerial meeting were given impetus during the past year and received new emphasis from the NATO Ministers at their December 1971 meeting in Brussels. I have been heartened by this demonstration of allied spirit in response to U.S. and allied needs in Europe. This integrated planning effort and action program is most essential to provide for our common security, especially in light of the continuing expansion of military power and potentials by Warsaw Pact nations. It is essential to the allied partnership, and it is essential to the maintenance of a position of strength from which to negotiate differences with our adversaries in the pursuit of peace.

2. Total Force Planning in Asia

> "In the next decade our Asia policy will be dealing simultaneously with three phases of Asian development. In some countries, there will still be an absolute -- though we hope diminishing -- need for us to play a central role in helping them meet their security and economic requirements. In others, we will complete the process of adjusting our relationship to the concepts of the Nixon Doctrine. And with all countries, we will be striving to establish a new and stable structure reflecting the renewed vigor of the smaller Asian states, the expanding role of Japan, and the changing interests of the Soviet Union and the Peoples Republic of China. . ."
>
> President's Foreign Policy
> Report to Congress, 1971

The United States is a Pacific power, and as such must recognize and accept its responsibilities in the area. We seek to do so as a partner, as one of a group of concerned nations acting in concert. It is our objective to support our allies and fulfill our treaty commitments in the context of the Nixon Doctrine.

Last year I noted that we do not plan for the long term to maintain separate large U.S. ground combat forces specifically oriented to the Asian theater alone, but we do intend to maintain strong air, naval and support capabilities. To serve as a deterrent and to support our allies, we continue, of course, to maintain balanced, forward deployed ground, air and naval forces in the Asian theater. However, we expect to continue to emphasize the strengthening of the military capabilities of our friends and allies, as we move toward Nixon Doctrine peacetime deterrent forces.

The forces and assistance which are provided in the FY 1973 Budget will enable us to continue to provide essential U. S. capabilities while moving in this direction in our planning.

Thus, in Asia, our primary emphasis lies in assisting our friends and allies in developing their own capabilities to cope with aggression, against both internal and external threats. In this sense, U.S. forces will increasingly serve a complementary role, and our security assistance programs are a key to making progress in this direction. I believe that we and the Asian nations have made considerable progress in this direction in the past year.

Final agreement has been reached with Japan on the reversion of Okinawa in 1972. Japan is to begin assuming responsibility for the immediate defense of the Ryukyu Islands.

The Republic of Korea has assumed responsibility for the defense of virtually all the Korean DMZ and, with our assistance, is undertaking substantial improvement of her own forces.

We have completed significant reductions in our own force deployments in the Philippines, Japan, Korea, and Thailand.

There is also concrete evidence of the dynamism and regionalism that exist in this region. In this regard, Australia, New Zealand and the UK reached agreement with Malaysia and Singapore on the continued forward deployment of an integrated ANZUK defense force in the two Southeast Asia countries under the new Five Power Defense arrangement.

Thus, although 1971 has been a year of progress, with progress must come change and change is not without its problems. We recognize that as these changes take place, problems and differences must and will arise in our relationships with the nations of Asia. We have sought to minimize the differences and we have laid stress on our many common aspirations; however, we do not hide from problems. We seek straightforward, honest nogotiations to find mutually satisfactory solutions. To facilitate this dialogue and emphasize the new role of partnership we seek, both former Deputy Secretary Packard and I traveled to the Far East this past year to discuss with our friends our common security objectives and means to accomplish them.

Japan

As we have all come to recognize in recent years, Japan's growing power on the Asian scene will make her one of the keys to peace and stability in Asia in the years ahead. The importance we attach to maintaining a close security relationship with Japan was underscored by the President in his meeting with Prime Minister Sato at San Clemente in January. A large share of their time together was devoted to a review of our mutal interests in the broad security problems of the Asian region. As they announced at the end of those meetings, and as I said after my trip to Japan last summer, the approaches of our two countries to these problems are complementary.

While some public opposition to our bases still persists in Japan and Okinawa, the Japanese Government recognizes the regional security role our forces play, and their ultimate relevance to Japan's defense. For our part, we are making every effort to streamline our base structure in Japan and Okinawa, and to keep our military deployments there to the minimum compatible with our mutually agreed security interests. In January of this year we reached general agreement with the Japanese Government on yet another consolidation of our military activities and reduction of our land use in the populous Kanto Plain area around Tokyo. As a part of the Okinawa reversion agreement, the whole or part of 34 facilities and areas on Okinawa will be returned. Additionally, 12 facilities will be turned over to the Japanese self-defense forces as they assume Okinawa's defense mission.

For her part, Japan has embarked on a fourth Five-Year Defense plan designed to improve qualitatively her self-defense forces to better perform their assigned task of defending the home islands. When the reversion of Okinawa takes place on May 15, 1972, Japan will begin to assume responsibility for the immediate defense of the Ryukyu Islands.

As a result of my trip to Japan last summer, I gained a better appreciation of Japan's need for military equipment modernization if her forces are to become effective against sophisticated threats. Accordingly, we are encouraging Japan to modernize the equipment of her forces, and have placed our technical services at the disposal of the Japanese to help assess their needs and determine what equipment we might be able to provide within Japanese budget constraints.

Korea

Our relations with the Republic of Korea provide an excellent example of the Nixon Doctrine at work as I saw on my visit there last year. As 1970 closed, the Republic of Korea continued to face across the demilitarized zone a hostile North Korean regime. Considerable effort was required during 1971 to prevent incursions of saboteurs and agents from North Korea and to apprehend those personnel who succeeded in entering the country, and this type of activity continues. North Korea continues to maintain the fourth largest Army in the communist world and to improve her military posture. It was in this environment that we and the Republic of Korea moved for-

ward in 1971 to implement the Nixon Doctrine and our new strategy. These have been the achievements:

-- U.S. troops no longer man any significant portion of the DMZ where they had been stationed since the cessation of hostilities in 1953.

-- ROK troops now have assumed responsibility for the security of the line dividing the two halves of Korea, with the exception of the very small portion devoted to the Military Armistice talks.

-- Authorized U.S. troop strength was reduced over the last year from some 60,000 men to the present strength of about 40,000.

-- A Five Year Modernization Program for the Republic of Korea Armed Forces has been instituted which, with Congressional sanction and support, will enable the Koreans to maintain an adequate defense posture. In addition, the ROK is taking steps to increase its own self-sufficiency by providing, through its own defense budget, items previously supplied by the U.S. which can be readily procured in Korea.

Cambodia

President Nixon said on November 12, 1971:

> ". . . Cambodia is the Nixon Doctrine in its purest form. Vietnam was in violation of the Nixon Doctrine. Because in Cambodia what we are doing is helping the Cambodians to help themselves, and we are doing that rather than to go in and do the fighting ourselves, as we did in Korea and as we did in Vietnam."

During the past year, the U.S. security assistance program in Cambodia has been an excellent example of how we believe the Nixon Doctrine should be implemented. In the first place, U.S. assistance is confined to military and economic aid, and some air support, with Cambodia assuming the basic responsibility for its own self-defense. The U.S. has no ground troops and no military advisers in Cambodia.

Additionally, the U.S. assistance effort is being complemented by military and economic aid from a growing number of Cambodia's friends in East Asia and the world. In January, a group of seven countries agreed to contribute to an economic stabilization fund for Cambodia. The most direct assistance, of course, is coming from South Vietnam. Indeed, one of the most encouraging developments of the last year was the increasing number of combined operations conducted by Cambodian and South Vietnamese forces against NVA/VC forces in Eastern Cambodia.

Most heartening of all has been Cambodia's own efforts to defend her territory and people against the North Vietnamese invaders.

Cambodia has expanded its military manpower six-fold in the past year and has been able to maintain the major populated areas under government control. Despite enemy interdiction efforts, Cambodia has kept open the major highways and is now assuming responsibility for Mekong River convoys from the South Vietnamese border to Phnom Penh.

These Cambodian efforts have, of course, also placed additional strain on the NVA/VC logistical system and helped to relieve pressure on U.S. and allied forces in South Vietnam. Thus, in the military area there has been considerable progress in the past year. But much more still needs to be done, particularly in the fields of training and logistics. These are the tasks we and our friends will be assisting Cambodia with in the coming year.

Vietnam

> "Vietnamization . . . has now effectively concluded the U.S. ground combat responsibility. Our other activities are being transferred to the South Vietnamese. We are ending American involvement in the war while making it possible for those who do not wish to be dominated by outside forces to carry on their own defense."
>
> President's Foreign Policy Report to Congress, 1972

The President in his Foreign Policy Report to the Congress has presented a comprehensive and detailed review of all aspects of our Vietnam policy. I would like in this Report to highlight those dimensions which are of particular concern to me as Secretary of Defense.

Vietnam became the test case and the first crucial step for implementing the Nixon Doctrine and our new planning approach to Asia. Vietnamization was based on the simple proposition that responsibility for the war should be turned over to the South Vietnamese. We expected them to defend themselves with our material and security assistance but without indefinite American combat involvement. The results to date have justified, in my view, the faith we placed in this new policy and in our South Vietnamese friends.

When we assumed office in January 1969, Americans were deeply involved in combat. And so we set out systematically to bring Vietnam into conformity with the principles of the Nixon Doctrine. 1971 has demonstrated the viability and effectiveness of the Nixon Doctrine principles we have applied in Vietnam.

The Vietnamization program has paved the way for a self-reliant South Vietnamese defense force, for increased cooperation among the other free nations of mainland Southeast Asia and for eventual restoration and maintenance of peace in Indochina. Should our approach to peace in Indochina through negotiations fail, our

strength through partnership approach will continue to make possible reductions in the level and intensity of the present conflict.

The Vietnamization program was planned in three phases:

-- Phase I- Assumption by South Vietnam of the ground combat role against Viet Cong and North Vietnamese forces. Phase I was completed last year.

-- Phase II - Development by South Vietnam of those support capabilities — air, naval, artillery, logistics and other support -- necessary to maintain effective security. Major progress was made last year notably including the turnover of in-country naval operations and a very substantial portion of the in-country air combat responsibilities.

-- Phase III - Reduction of American presence to a military advisory mission, with whatever small security forces are needed to protect this mission, and then further reductions as South Vietnam becomes capable of handling the threat with no U.S. military presence required.

Our activity in Indochina has been and will continue to be in consonance with the goals we established at the beginning of Vietnamization. We seek to:

-- Maintain our obligations and interests in Asia as we move toward a generation of peace;

-- Reduce American casualties:

-- Secure the release of our Prisoners of War and an accounting for our missing in action.

-- Continue to withdraw U.S. forces; and

-- Transfer military responsibility to the Republic of Vietnam in a way that provides the South Vietnamese with a realistic capability to defend itself from aggression.

We are closer now to meeting these goals than at any time in the past. During each of my four trips to Vietnam as Secretary of Defense, I have been heartened by the progress which has permitted me to recommend and the President to direct further reductions in U.S. troop strength.

As I prepare this Report, the situation in Vietnam remains encouraging. Phase I of Vietnamization is completed, with only a small U.S. ground combat force remaining in a security role to protect U.S. forces as Phase II progresses. Phase II is progressing ahead of schedule as the Vietnamese themselves work hard to complete the complex training required before they can fully assume an effective support role. Phase III has begun with the reorganization

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of our corps and field force headquarters to assistance commands and with reductions contemplated in our military headquarters in Saigon.

In sum, the major part of our Vietnamization program has been accomplished and we are ahead of schedule on the tasks that remain. The philosophy that predominated as we assumed office in 1969 of a U.S. "takeover" of military activities in South Vietnam has been superseded by the reality now of a U.S. "turnover" of responsibility for continued combat operations, as every statistical indicator confirms. Vietnamese forces have demonstrated professional skill, valor and combined arms effectiveness in their operations to date. Particularly noteworthy has been the ability of the Vietnamese to operate away from their permanent bases in areas the enemy has occupied for years. While we cannot expect the South Vietnamese to win every battle, their effectiveness should increase even more as they gain more confidence and strength.

During my second trip to Vietnam in February 1970, I encouraged greater coordination of our military activities with the economic aspects of Vietnamization. The economic implications of Vietnamization are complex but the response to our new emphasis has been encouraging. The burden of defense reduced the availability of goods and services to Vietnam and its people. The result was a rampant inflation; prices rose by 650 percent in the five-year period ended June 1970. The withdrawal of U.S. forces and the consequent reduction in Vietnam's foreign exchange earnings threatened the economy still further. The Vietnamese themselves, however, are displaying a growing economic sophistication and learning to control their wartime economy. Government-instituted reform measures in September and October of 1970 and in March and November of 1971 have addressed many of the economic difficulties facing the Republic of Vietnam with the latest reforms stressing self-sufficiency as a goal. In addition, a reorientation of our economic assistance programs has contributed to achievement of relative stability and enhancement of prospects for growth.

The implication of this improvement in the economy of Vietnam is that the Vietnamese will soon be able to shoulder more of the financial cost of providing for their security while at the same time they benefit from the higher standards of living which increased security and economic stability and growth assure. Nevertheless, continued substantial U.S. economic assistance will be needed for the foreseeable future.

With respect to negotiations, the President's recent nationwide address on January 25, 1972, and the detailed description of our efforts to achieve a settlement presented in his Foreign Policy Report conclusively demonstrate our willingness and Hanoi's refusal to date to achieve an early and honorable peace through negotiations. In this connection the President described, and I would like to underscore our deep concern for the American servicemen now held captive by the North Vietnamese and Viet Cong in Indochina, and for those missing in action. The other side has continued to violate the provisions of the 1949 Geneva Convention with regard to prisoners of war and to ignore the protests of the United States and the civilized world. Hanoi's violations of the Geneva Convention are as follows:

The Geneva Convention requires that prisoners be humanely treated and protected. This provision has been consistently violated.

The Geneva Convention requires that neutral inspection of prisoner camps be permitted, including interviews of the prisoners without witnesses in attendance. The enemy has never permitted such inspection or such interviews.

The Geneva Convention requires that the names of all prisoners be released promptly. Such names as the enemy has released have not been released promptly nor through regular channels.

The Geneva Convention requires notification of deaths in captivity and full information on the circumstances and place of burial. The enemy has not furnished any information about circumstances of death and place of burial.

The Geneva Convention requires that prisoner of war camps be marked clearly and their location be made public. The enemy has not marked its camps nor divulged their location.

The Geneva Convention requires that the seriously sick and wounded be repatriated or interned in a neutral country. The enemy has refused to comply with this provision.

The Geneva Convention requires that prisoners be permitted to send at least 2 letters and 4 cards a month. The average has been 2 or 3 letters a year and none at all from some prisoners.

The Geneva Convention requires that sufficient food must be given to prisoners. Yet, all of the released prisoners have been found to be underweight and suffering from malnutrition.

The Geneva Convention requires that prisoners not be held in close confinement. Yet, the enemy has held some men in solitary confinement for years.

The behavior of the enemy in flouting the basic precepts of humanity and international conventions and in contributing to the anguish of our POW/MIA families must end. Neither President Nixon nor I will consider Vietnamization to be completed until the Prisoner-of-War and Missing-in-Action issues have been resolved.

3. Total Force Planning and Security Assistance

In deterring subtheater or localized warfare, i.e., non-nuclear conflict that does not involve the USSR or PRC in combat, the country or ally which is directly threatened bears the primary burden, particularly for providing the manpower for its defense.

We believe that our allies can and must increasingly bear the primary burden for planning to cope with subtheather and localized conflicts. Such conflicts, running from localized insurgency or guerrilla warfare to the type of conventional attack which North Korea itself could mount against South Korea will continue to threaten the security of our friends and allies through the 1970's. Although security assistance is not limited to the friends and allies threatened by subtheather/localized conflict, in practice, the bulk of our assistance goes to these countries.

A strong, effective program of security assistance to key friends and allies is an indispensable tool for implementing our National Security strategy of Realistic Deterrence. It also plays a central role in fulfilling the Nixon Doctrine objective of a more equitable sharing of the Free World defense burden.

President Nixon has indicated that in the future the U. S. would look to the forces of our allies to deal with guerrilla and subversive threats. However, he emphasized that the United States can and will furnish military and economic assistance to supplement this local effort, where our interests are involved. Elaborating on that theme in his Foreign Aid Message to the Congress on April 21, 1971, the President pointed out that increased security assistance "enables us to continue to reduce our direct presence abroad, and helps to reduce the likelihood of direct U.S. military involvement in the future."

In that same address, the President underlined the importance he attaches to foreign aid as a tool of his foreign policy for the 1970's. He announced his decision to reform the U.S. aid effort, beginning with creation of separate structures for security-related, development, and humanitarian assistance. The various ongoing assistance efforts which serve U.S. security interests were thus combined into one coherent program. The elements of that program are the following:

-- Military Assistance Program (MAP) - grants of military weapons and other equipment, as well as of military training.

-- Foreign Military Sales (FMS) Credit - government-to-government or commercial sales of defense material financed by U.S. government or by government-guaranteed credit.

-- Security Supporting Assistance - aid intended to offset, in part, the impact of exceptional defense costs of the recipient country on its civilian economy.

-- Non-funded Security Assistance - Grant Excess
- Grant Excess Transfers - material declared excess to U.S. force requirements.

- Equipment Loans and Leases - primarily ship leases.

- FMS Cash and Commercial Military Sales

a. Security Assistance Organization, Reform and Planning

During the past year, a number of steps have been taken in the Executive Branch to make the planning and administration of security assistance more effective.

In reshaping the foreign aid program, the President directed that the planning of all security-related aid program elements be integrated. Accordingly, although MAP and FMS programs were administered in the Defense Department, while economic supporting assistance was administered by AID, during the period in which the FY 1973 security assistance budget was being constructed and subjected to the President's final review, security assistance was treated as an integrated whole.

Within the Department of Defense, I have initiated several innovations to improve integration of security assistance in the overall U.S. security effort. For the first time, planning for FY 1973 military assistance and credit sales took place within the Department of Defense Planning, Programming and Budgeting System (PPBS). The results of the initial effort were gratifying to me because of the long-term prospects for more efficient security resource allocations within the Total Force Concept.

A second important step was creation of the Defense Security Assistance Council, and the Defense Security Assistance Agency, which are discussed in the Organization and Management chapter.

I would note that security assistance planning continues to be an interagency effort within the Executive Branch. This procedure insures that the Department of State is able to exercise its statutory responsibilities for policy guidance of security assistance while the Department of Defense will continue to manage the military program, thus permitting more effective use of all defense resources.

b. Progress in Total Force Planning and Security Assistance.

1. Combined and Complementary Force Planning and Security Assistance

Vietnamization has had a major impact on the size of U.S. forces, as it has permitted step-by-step transfer of responsibility for combat operations to South Vietnamese forces without diminution in security and without undue burden on the stability of the Vietnamese economy. Similarly, joint development and implementation of a U.S.-Republic of Korea five-year security assistance modernization for their forces program has permitted withdrawal of one U.S. division from Korea in FY 1971.

I would emphasize that substantial security aid to South Vietnam must be maintained to continue this progress. Our security assistance to the peoples of Laos, Thailand and Cambodia in their struggle to maintain their independence has likewise been essential, and it will continue to be so for some time. Unlike other country programs, most security assistance to South Vietnam, Laos, and Thailand has been provided for several years through the Defense budget. The Thailand program is being returned entirely to regular International Security Assistance funding for FY 1973.

In South Korea, national forces are assuming increased responsibility for their own defense. The ROK Government must maintain large defense forces to meet the threat posed by well-equipped forces in the North. Consequently, it must support a heavy burden on its national economy, and simultaneously undertake increased production in country of defense equipment, aided in part by MAP and FMS credit. Thus, South Korea may continue for some time to be dependent on the United States for support of its defense efforts. Nonetheless, greater Korean self-sufficiency in defense is signaled by that government's recent agreement to assume responsibility for procurement of operating material formerly supplied under MAP as well as inauguration of an FMS credit program to finance development of M-16 rifle and ammunition production facilities in-country.

A significant feature of the five-year program to advance Korean force modernization is our plan to provide the new International Fighter Aircraft, the F-5E. This aircraft has been developed specifically to meet the need of allied and friendly air forces for an effective and flexible, yet relatively simple and inexpensive new fighter aircraft. Congress had a strong role in initiating this program.

U. S. security assistance to our NATO allies, except for Turkey, Greece and Portugal is limited almost exclusively to military export cash sales. Credit assistance is no longer required in most instances, and military sales to Europe represent an economic gain rather than a drain to the U.S. However, three allies, Turkey, Greece and Portugal continue to require outside grant and credit security assistance to permit them to improve their capabilities for fulfilling their assigned roles in NATO defense plans. Indeed, their importance to U. S. and NATO security interests have increased significantly in recent years as a result of the Soviet military buildup in the Mediterranean and the volatile situation in the Middle East. Both Greece and Turkey have demonstrated their dedication to NATO defense by major manpower and resource commitments to the Alliance. It is in the U. S. interest, therefore, to assist these willing allies to make a more effective contribution to NATO defense by helping them acquire more modern defense equipment and improved training. In the case of Greece, economic growth now permits U.S. assistance, for the most part, to take the form of FMS credit for arms purchases rather than outright grants.

2. Supplementary Planning and Security Assistance

Security assistance can also advance U.S. security in ways less directly related to specific force trade-offs under total force planning. As we work cooperatively with the military officers who play such an important role in many Latin American countries, our missions and assistance programs further our interests while responding positively to those of the Latin Americans. Latin American nations are our partners, not our dependents. We seek only to assist -- partly through the several, less explicitly military aspects of our security assistance programs such as training aids -- in preserving the environment within which social and economic progress can occur.

Among our hemisphere neighbors and elsewhere, selectively, throughout the world the United States seeks to utilize judiciously its diplomatic, economic and military resources to help avert war. We must strike a balance and take care, for example, that our security assistance does not contribute to hostility between neighboring states and forces. We provide security assistance on a case-by-case basis to assist friendly countries to combat insurgency and help defeat externally inspired subversion and maintain the kind of military balance which will deter external attack. In supplying security assistance, and in the licensing of military exports through commercial sale, we seek to emphasize regional arrangements that enhance stability. We must recognize, however, that every nation has the right to be prepared to defend itself against internal and external threats and that most nations do not themselves produce the equipment for their own defense that they may need. We must also be cognizant of the fact that today, as never before, foreign countries have alternatives to acquisition of defense equipment from the U.S. -- particularly if some form of purchase is involved. Nonetheless, we shall continue to review most carefully potential sales of military equipment, even to close allies, and to refuse them where regional security or other U.S. interests would be adversely affected.

c. Security Assistance Legislation

For FY 1972 the President proposed to the Congress that it enact sweeping new foreign aid legislation authorizing and funding security assistance separately from development and humanitarian aid. The Congress elected to defer consideration of this approach and instead to appropriate funds under existing legislation. Nevertheless, by the end of the 1971 session I believe that the benefits associated with combining all elements of security assistance into a cohesive program separate from development and humanitarian programs was appreciated by a majority of the Congress.

d. Summary

I believe that presentation of security assistance budget requests in the context of the overall U.S. national security program will permit easier understanding of the linkage between the U. S. force posture and overseas deployments, on the one hand, and adequate security assistance to allied forces, on the other.

It is important that the Congress recognize and understand the important role that grant military assistance and other forms of U. S. security assistance have played over the past two and a half decades in countering threats to non-Communist countries. For while the burdens in blood and dollars which the American people have borne to help defend others have been great, they would in my judgment have been far greater without security assistance. During the past few years, I believe that we have made major progress, through security assistance, in strengthening the capabilities of Free World nations to defend themselves, thereby helping move toward a more equitable sharing of the defense burden.

U.S. NATO FORCES IN EUROPE

Secretary LAIRD. I think it might also be well for us to address the manpower objectives and goals, if that suits your pleasure.

Chairman ELLENDER. I will tell you, Mr. Secretary, we are going to have another amendment submitted this year, which I supported last year, to remove some of our U.S. forces from Europe. It might be well that you make your case here for the retention of these personnel in Europe.

Secretary LAIRD. Mr. Chairman, the Chairman in his briefing will show the NATO forces plus the Warsaw Pact forces, and the need to maintain the 4⅓ divisions and the 6th Fleet. I think it is a very adequate briefing, in addition to these discussions yesterday. I think it would be most helpful to the committee.

Chairman ELLENDER. You are still of the belief that, as I think the President stated, the troops will remain in Europe until at least the end of fiscal year 1973?

Secretary LAIRD. We have in this budget funds to maintain the force deployments of the Navy, Air Force, and Army in Europe current levels with minor adjustments through fiscal year 1973.

Chairman ELLENDER. That is your position now?

Secretary LAIRD. That is my position and this budget supports that.

U.S. TROOPS IN OTHER AREAS

Chairman ELLENDER. Will your statement cover the U.S. troops in other areas, such as Japan?

Admiral MOORER. Yes, sir, I can when I give my briefing. I didn't have that in it, but it would be easy to put it in.

TROOP REDUCTIONS UNDER NIXON DOCTRINE

Secretary LAIRD. I want you to know that we have made very substantial reductions in U.S. forces in Asia. We will have reduced authorized strength in Vietnam by 480,000 by May 1, 1972. I would like to put the reductions that have been made in U.S. forces in Asia under the Nixon doctrine in the record at this point.

(The information follows:)

KEY REDUCTIONS IN AUTHORIZED U.S. MILITARY PERSONNEL IN EAST ASIAN COUNTRIES

Country	Authorized U.S. strength		Reduction
	January 1969	December 1971	
Korea	63,000	43,000	20,000
Thailand	47,800	32,000	15,800
Japan	39,000	32,000	7,000
Philippines	28,000	18,000	10,000
Total			52,800

Chairman ELLENDER. Mr. Secretary, as you well know the Congress made a substantial reduction in the funds requested for intelligence activities in acting on the fiscal year 1972 budget. As I recall we had over 150,000 people engaged in intelligence activities at one time and as the result of specific reductions and manpower limitations this total

will be reduced to about 116,000 at the end of fiscal year 1972. In going over your statement the other night I noted with pleasure that you expect further reductions during fiscal 1973.

INTELLIGENCE-RELATED PERSONNEL REDUCTION

Secretary LAIRD. That is correct. In this budget we will reduce intelligence manpower to about 109,000 by the end of fiscal 1973. The congressional reductions of last year required us to go down to 116,000. We started out in the fiscal year 1972 with 134,000 intelligence personnel. We have programed a reduction to a level of 116,000, at the end of fiscal 1972 a reduction of 18,000 in this area during those 12 months.

We are recommending in this 1973 budget a further reduction of about 7,000 additional personnel.

Chairman ELLENDER. Will that reduce it to 109,000?

Secretary LAIRD. About 109,000 people are included in this budget.

Chairman ELLENDER. What is the current status of the reorganization of intelligence activities within the Department of Defense? You wrote me a letter about this recently.

Secretary LAIRD. I have gone forward in the defense report and explained that in some detail, Mr. Chairman. This reorganization was in accordance with the wishes of your committee and with the wishes of the Senate Armed Services Committee and the House Appropriations Committee and the House Armed Services Committee that we should utilize our resources in a much more effective manner, and I think we are.

We now have an Assistant Secretary of Defense for Intelligence who has the overall responsibility for this resource allocation within our Department, and I think this has been a very important improvement as far as the Department is concerned. I do feel we have come down quite rapidly.

PAY AND COST INCREASES

The funding included in this budget will reduce us again in personnel. It is larger than the amount appropriated for fiscal year 1972, but it does not even keep up with all the pay and price increases. In constant fiscal year 1973 dollars the 1973 funding level is actually less than the funds available in fiscal 1972.

Chairman ELLENDER. I can see your problem, of course. I expected a reduction in personnel as well as moneywise. But with the increased pay that Congress provided, even though you have fewer personnel, the cost is more than it was last year.

I expect to study in detail that part of your statement dealing with the reorganiationz of the intelligence activities. During the hearings of the Intelligence Operations Subcommittee, I concluded that we needed stronger central management of the expensive activities and operations.

Secretary LAIRD. Yes, and as I understand it, we will also have a further opportunity. The Assistant Secretary of Defense for Intelligence will be appearing before your committee in the overall presentation of this intelligence budget and the justifications for the further reductions we have made in accordance with what I felt were your desires.

Chairman ELLENDER. That is correct. The Intelligence Operations Subcommittee will conduct hearings on the specific items included in the total intelligence budget.

In respect to weapons acquisition and manpower programs, race relations, and the defense and the economy, I think we have discussed that sufficiently. There is only one more subject.

REPORT OF FORMER DEPUTY SECRETARY PACKARD

Secretary LAIRD. Mr. Chairman, I would like to give you a copy of Mr. Packard's report. As I told you today, it is a no-nonsense report, which I will supply to you. It is written strictly the way Dave Packard talks.

Chairman ELLENDER. I believe that we have already placed it in the record at an appropriate place. Mr. Packard was in my office some time ago, and I really regretted that he was leaving.

(The report appears on page 364.)

Secretary LAIRD. I regret that he had to leave, too, because he made a very valuable contribution in this field. The ultimate effects of his recommendations will not really be felt for 2 or 3 years, but they have had a very great impact upon our programs.

A–X AND CHEYENNE AIRCRAFT COMPETITION

Chairman ELLENDER. There is one more subject I would like to discuss before we finish—the A–X and Cheyenne close air support aircraft.

I discussed this matter on several ocassions with Secretary Packard, and based on those discussions, I thought a decision would be made during fiscal year 1972 to continue the development of the A–X or the Cheyenne, but not both of them. In fact, I think some members of this subcommittee, including myself, feel that a commitment of sorts was given that such a decision would be made during fiscal year 1972.

The budget for fiscal year 1973 includes $53.5 million to continue the Army's Cheyenne helicopter and $48.1 million to continue the development of the Air Force's A–X. It seems to me that the Army's Cheyenne request is based on a production decision being made in fiscal year 1974, and the record is clear that the Air Force wants to produce A–X.

What is your position on this question of a close air support aircraft?

Secretary LAIRD. Well, Mr. Chairman, first in regard to the commitment that you referred to of Mr. Packard to you or to this committee, it was Mr. Packard's intent in his earlier testimony before this committee that a decision could be made in the time period to which he first alluded; that is in fiscal year 1972, the current fiscal year. But I asked him to make this close air support study. And one of the last things he did before he left as Deputy Secretary of Defense was to make a recommendation to me as Secretary of Defense that we have evaluations of the prototype versions of advanced helicopters and that we consider the feasibility of including other fixed-wing aircraft—such as the A–7—in the competitive flyoff scheduled for the A–X program.

As far as the decision as to which system to procure, there has been no decision made. But we do plan a decision on how best to proceed in fiscal year 1973. All we are doing for this next year is prototype testing as far as the A–X is concerned.

As far as an advanced helicopter is concerned, we are asking for R. & D. funds to obtain three Cheyenne prototypes and to conduct continued flight testing of the Cheyenne and flight testing of the Sikorsky Blackhawk and the Bell King Cobra. A production decision as far as the Cheyenne is concerned would not be made until October of 1972. Moreover, the competitive flyoff of the A–X prototypes will not be completed until December 1972.

FORMER DEPUTY SECRETARY PACKARD'S REPORT ON PHASE I AND PHASE II UPDATED STUDY

I have accepted Mr. Packard's recommendation and we are proceeding along the line that we should continue the development of these systems until we have adequate information for a complete evaluation.

If you would like me to put the report made by Mr. Packard at the close of phase I of the close Air Support Review in the record, at this point, I would be glad to do it. I will also provide you with an update on phase II of the study.

(The documents follow.)

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C., June 22, 1971.

HON. JOHN C. STENNIS,
Chairman, Committee on Armed Services,
U.S. Senate,
Washington, D.C.

DEAR MR. CHAIRMAN: We have completed the initial phase of the close air support study we undertook to gain further insight into close air support and to assist in developing our recommended programs on AX, Cheyenne and Harrier. The Review Group included representatives of the Military Departments and the Joint Staff who brought to our meetings a broad background in the employment of close air support. In addition, representatives of DDR&E and ASD(SA) provided the group with the necessary technical and analytical capability. I chaired the policy guidance group and have reviewed the study.

Attached is a brief summary of this initial phase of the study. The conclusions and recommendations in this summary are my own and are concurred in by the Joint Staff, DDR&E, and ASD(SA) representatives. The conclusions and recommendations have been generally accepted by the representatives of the three Military Departments. Their comments are also attached. The detailed report enclosed was based on selected inputs prepared by the Joint Staff and the Military Departments. While this detailed report should not be considered as a report of the Review Group itself, I believe that the data presented will provide further support to our conclusions and recommendations.

Sincerely,

DAVID PACKARD.

CAS STUDY SUMMARY AND CONCLUSIONS

INTRODUCTION

Close air support has become an essential ingredient in any successful land campaign. Examination of conflicts to which U.S. forces could be committed in the late 70s shows an increasing requirement for close air support, both in quantity and quality. To meet these requirements, the Department of Defense has initiated several programs to develop close air support weapons and systems. The Department is developing the Cheyenne helicopter, the A–X fixed wing aircraft for close air support, and has a limited procurement program for the

Harrier, one whose prime missions is close air support. In addition, a number of new weapons specifically for close air support have been or are being developed.

Congress has become increasingly interested in the issue of close air support and in the systems being developed by the Department for this mission. This report summarizes a recent Department effort which re-examined close air support, in order to increase our own understanding and to respond more fully to congressional questions.

In February of this year the Deputy Secretary of Defense formed a group to examine the issue of close air support, emphasizing the criteria by which close air support systems must be judged. This Close Air Support Review Group consisted of senior members of the Services, Joint Staff, and OSD. The study sponsored by this group has led to increased knowledge of many important aspects of close air support and identification of several areas which must be clarified before the department proceeds with substantial procurement of new close air support systems.

PURPOSE

Although considerable discussion in the past has focused upon roles and missions, it became apparent quite early in the review that this issue is really secondary. The primary issues are what capabilities are needed and how to obtain them in the most cost-effective manner. Consequently, this study focused attention on the estimated requirements for close air support and the capabilities and costs of both current and projected close air support systems .

THE NEED FOR CLOSE AIR SUPPORT

To assess the qualitative requirements for close air support, the Joint Staff was asked to develop a set of scenarios based on current intelligence projections for the 1976–1980 period that would provide a realistic perspective on the probable operational environments for close air support. The Joint Staff developed scenarios in [deleted]. Detailed situations were constructed to provide a framework for analysis. Although they are not necessarily predictions of future events, these detailed engagements are representative of situations in which U.S. forces could be involved and are a realistic basis for assessing the requirements for close air support. [Deleted.]

Taken together, the scenarios represent a wide range of likely combat situations in which the presence of close air support could be decisive in achieving success for U.S. forces. They clearly indicate the diversity of targets, environments and requirements for the close air support mission.

DEFICIENCIES AND IMPROVEMENTS

Given the requirements for close air support. the current inventory was examined to determine whether existing capability is sufficient. Current inventory systems being used for close air support were originally designed primarily for other missions. From the situations examined during this study, it is apparent that our current inventory systems platforms and weapons will not provide adequate capability in the future. The following are among the reasons for this conclusion:

Much of the inventory would be assigned to tasks other than close air support, particularly in NATO Central Europe. Many current aircraft/weapon combinations do not possess adequate delivery accuracy against close air support targets. Present and future enemy air defense systems constitute an unparalleled threat to all colse air support aircraft. Acquisition of small tactical targets is not adequate especially when enemy air defenses preclude extended search time. [Response times are too long for immediate (as opposed to preplanned) missions.] Requirements for large fixed bases increase vulnerability, decrease flexibility (e.g., in amphibious operations) and reduce responsiveness and sortie rates.

For these and other reasons, major improvement in our close air support capability is vital. This includes improved ordnance, target acquisition systems and command and control. It includes improvements in current inventory aircraft and development of new aircraft systems for possible inclusion in our future forces.

Where a requirement exists for massive application of firepower, fixed-wing aircraft offer the only available means of rapidly bringing to bear large amounts of ordnance from distant points against targets at and across the FEBA. There is considerable value in relatively low cost aircraft which are less vulnerable to

ground threat systems. Where ground units are engaged with armored forces and especially under conditions of low ceilings and poor visibility or at night, attack helicopters with enhanced target acquisition systems could provide a crucial capability. It now appears to be within the state-of-the-art to develop a combination of attack helicopters and fixed-wing aircraft that can provide the required capability for high intensity conflicts.

Among the improvements being sought in the A–X and Cheyenne are the following: A–X is being designed to have a vulnerable area [deleted] that of comparable current aircraft. Its 30mm gun will provide a unique capability against enemy tanks. STOL capability will permit dispersed operation and, together with air loiter capability, greatly increase responsiveness. Cheyenne incorporates a variety of new systems and capabilities. This air vehicle provides substantial increases in payload, endurance, range and maneuverability. Stabilized optics, night vision, navigational accuracy will enhance target acquisition and survivability. Accurate fire control, off-axis firing cannons and the TOW missile promise excellent standoff attack effectiveness and defense suppression for helicopters.

The Marine Corps requires a system with multi-mission capability. The Marines enter an area by ship, transistion to a beachhead, and then rapidly penetrate forward. This places extreme requirements upon aircraft supporting the Marines. Current planning is for aircraft to fly from an off-shore carrier until a SATS field has been put down on the beachhead. However, as the Marines move inward, the distance between the SATS field and ground commander increases. Harrier is the first operational V/STOL jet aircraft. V/STOL technology will enable the aircraft initially to operate from smaller and much less expensive ships than carriers, to operate from beachhead areas without a SATS field, and to move forward with the ground units without requiring extensive preparation of facilities. Dispersed forward sites and facilities enhance responsiveness and survivability against enemy air attacks. Harrier's sortie rate is expected to be [deleted] times that of the A–4.

Some of the foregoing characteristics have already been demonstrated. Many remain to be demonstrated and this is an essential precondition for substantial procurement of any of the aircraft. The projected system capabilities of A–X, Cheyenne, and Harrier are uniquely different and extensive examination of these capabilities in the scenarios show each aircraft to be markedly superior to the others in likely and important situations.

CONCLUSION

A careful examination was conducted of likely requirements of close air support in the late 1970's and the methods by which close air support systems can most efficiently be used. The study made clear that Harrier, A–X, and Cheyenne could offer significant improvements over current systems and possible improvements to them. The study pointed out a number of crucial characteristics which must be demonstrated if these systems are to provide the cost-effectiveness postulated for them. The Department has established test programs to determine achievement of these characteristics. Among the primary areas being investigated in the test programs are the [deleted] vulnerability of A–X, the target acquisition capability of armed helicopters, and the sortie rate capability of the Harrier from austere facilities.

The following set of conclusions are a synthesis of the views of the Review Group. The recommendations which follows the conclusions were developed and endorsed by the Review Group whose members included military personnel experienced in the conduct of close air support emissions and in the command of units tasked to these missions. The members were also requested to submit any additional points they believed should be included and these are attached along with the report produced by the OSD/Joint Staff/Service group.

1. Close air support is a complex mission.—Close air support systems complement and supplement the fire provided by other weapons, aerial, naval, and ground. Interaction with ground elements is one source of complexity. The diversity of probable scenarios, targets, tactical situations, terrain and weather conditions is another.

2. The complexity and diversity of close air support leads to realistic requirements for different types of systems.—One aircraft cannot do everything another aircraft can. The Cheyenne, Harrier, and A–X center their capabilities in important sectors of the CAS spectrum: Cheyenne in discrete, responsive, highly mobile fires operating as part of the ground maneuver force; Harrier in rapid

response to urgent firepower requirements during amphibious operations; and A–X in concentrating heavy firepower, matching selected munitions to different targets, at threatened sectors from dispersed bases. Although in less demanding situations there is a degree of overlap in capabilities, each of the three aircraft has unique capabilities in many tactical situations, and each presents different problems to enemy defenses. Therefore, the three types of systems are strong candidates for our future CAS forces.

We have also learned in both the Korean and Vietnam Wars that the capabilities required by our forces differed from those we had prepared. This lesson points up the need for adaptable and flexible systems in the future and a spectrum of capability which current systems cannot provide.

3. Highly likely situations for employment of US forces have CAS requirements which exceed current capability.—CAS is a critical element in the defense of NATO. Moreover, the Soviet Union has developed potent air defense weapons which pose a severe threat to aircraft engaged in close air support. Technology offers a potential to produce aircraft and munitions optimized for the attack of mobile mechanized ground forces accompanied by air defense systems. These new weapon systems could offset the imbalance of ground armor in Europe and provide a more favorable position for NATO forces.

4. We have modifications under development which will improve the lethality of CAS systems but will not complete ther required increase in capability.—Modifications to current aircraft systems will provide improved delivery accuracy and the full capability to employ laser guided weapons, resulting in significant improvement in target destruction potential. Moreover, these weapons can be delivered from standoff ranges, thereby significantly reducing attrition at the target. Although these modifications will add a substantial increment in lethality, they will not achieve, however, the measure of flexibility of employment, responsiveness, survivability, and all-weather capability needed for fully effective CAS.

5. The new systems have the potential of substantial increases in effectiveness if certain characteristics can be achieved.—All three systems taken together are adaptable to a broad range of tactical situations providing increased CAS capability. Each system offers a substantial improvement in responsiveness over current and modified systems: The Cheyenne, because it can operate within battlefield organizations from dispersed and unprepared sites within minutes of hostile forces by day, by night, and in bad weather; the Harrier, because it can operate from air-capable ships and from dispersed forward bases during the early critical phases of amphibious assaults before airstrips can be constructed; the A–X because it possesses the capability to operate from dispersed forward airfields and to air loiter for long periods over the battlefield. All three systems have survivability features: The Cheyenne's armor, ability to navigate while flying nap-of-the-earth out of sight and out of radar coverage of the enemy and its ability to engage targets continually through 360° for suppression; the Harrier's capability to operate from dispersed, forward bases; the A–X's high maneuverability, armor, and structural design.

In addition, the A–X combines protection with large and varied ordnance loads, including an antiarmor 30mm. gun, and long loiter capability to deliver firepower against massed forces or individual targets as the battle situation dictates. The Harrier is the world's first operational VTOL fighter/attack aircraft, with the ability to take-off and land without prepared runways. The Cheyenne possesses the hover and maneuverability of the helicopter to provide agility in frontline operations and operates under the command of the frontline maneuver commander by day, night, in smoke, and adverse weather. These aircraft, however, must realize their unique capabilities operationally if they are to provide the substantial increase in CAS effectiveness that is needed.

6. A–X, Cheyenne, and Harrier offer sufficiently different capabilities for our future forces to justify continuing all three programs at the present time. The Harrier production plan now before Congress should continue. However, decisions to produce A–X and Cheyenne and any subsequent procurement of the Harrier will depend on whether these aircraft meet their cost and performance goals and whether the operational requirement to justify their production is validated. A large number of performance parameters must be subjected to operational test for all aircraft. In particular, to understand the detailed employment of these systems, the following important factors must be further explored:

(a) The ability of helicopters to acquire targets near the maximum ranges of their weapons [deleted].

(b) The relative times involved in a helicopter acquiring a ground target versus acquisition of the helicopter by air defense systems.

(c) The ability of special A–X design features to make it much less vulnerable to enemy antiaircraft fire than current aircraft.

(d) The ability of our logistic systems to support forward-deployed CAS aircraft while supporting high ordnance delivery and sortie rates.

(e) The ability of Harrier to maintain high sortie rates from forward-deployed bases.

(f) The effectiveness of both delivery tactics and suppressive methods in enabling our CAS aircraft to survive in a severe air defense environment (such as in Europe).

(g) The effectiveness of our new antitank missile systems, particularly TOW and Maverick, in a combat environment and our ability to develop an antitank 30mm gun and round.

7. The Department of Defense has a serious test program addressing these uncertainties.—These factors cannot be resolved by paper studies. Physical testing of the systems is required before more meaningful conclusions on their detailed employment can be developed.

RECOMMENDATIONS

1. Continue the Harrier procurement plan now before the Congress.
2. Continue the A–X and Cheyenne development programs.
3. Execute tests to resolve the uncertainties found during this study so that the necessary information for decisions on production of Cheyenne and A–X and further procurement of Harrier will be available.
4. Continue to refine the methodology for evaluating and comparing alternative close air support systems and arriving at procurement decisions. The results of present methods often require too many qualifications and cautions for meaningful interpretation.

DEPARTMENT OF THE AIR FORCE,
HEADQUARTERS TACTICAL AIR COMMAND,
Langley Air Force Base, Va., June 18, 1971.

Memorandum for Mr. David Packard, The Deputy Secretary of Defense.

Subject: Comments as Requested on the Close Air Support Summary Report To Be Submitted to Congress.

1. It was not feasible with the current limitations of analytical models to fully expose the A–X, Cheyenne and Harrier to multiple target arrays and defenses. Consequently, the relative capability of each weapon system in this type of environment remains an indefinite quantity. In my view, the urgency for detailed testing of all three weapons systems in a real life environment is essential for any future determination of the need for all three systems. For this reason, I agree with the requirement to continue the R&D on all three vehicles and then field testing to determine a production decision.

2. I agree with the recommendations as presented. I believe the conclusions generally represent a synthesis of the Review Group discussions. There is, however, an implication that it was the synthesis of the group that there is a need for all three systems in the future CAS force. In view of the limitations of the analysis as indicated in paragraph one above, I do not believe we can conclude there is a need for all three systems in the future force structure until such time as these extensive field tests involving varying levels of defenses have been completed.

3. One of the most sensitive elements of the study was the night all weather attack problem. In the case of the A–X it appears to me the conclusions imply a capability far less significant than what the Air Force ascribes to it. On the other hand, the Cheyenne is given a much greater capability than what appears realistic under the postulated defenses in a sophisticated environment. Since this area is the pivotal issue on the utility of the Cheyenne, it is even more important that early field test of the night/all weather tank killing capability of the Cheyenne be tested against the A–X and other all weather systems and techniques utilized by Air Force tactical air units.

WILLIAM W. MOMYER,
General USAF, Commander.

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C., March 17, 1972.

HON. ALLEN ELLENDER,
Chairman, Committee on Appropriations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: As you know, our program for FY 73 includes requests for funds for the continued improvement of our Close Air Support capability. I know that you and your committee are convinced that this is a vital function warranting your close attention to assure the necessary capability is provided and the mission performed in an efficient way.

My predecessor, Dave Packard, shared your concern on the importance of Close Air Support and chaired our DOD Review Group. I believe that his report of last June reflected his personal interest in this problem and our continuing determination to provide the best capability to perform this function. As you consider our FY 73 program, you may find it useful to have an updated report on Phase II of our study, on some of the Phase I test programs, and on our objectives through FY 73.

As reported to you last year, our initial review made it clear that command and control, logistics, and basing concepts were critical considerations in the effective use of Close Air Support. These areas are being addressed by Phase II of our study. We are working closely with the Joint Staff and the three military departments, and we are paying particular attention to the needs of users—that is, the ground forces in contact with the enemy—in looking at these areas. We will complete the second phase of this study by this summer and will provide the results to you at that time.

In addition, to increase our knowledge of many important aspects of Close Air Support, we are conducting a series of tests of the various Close Air Support vehicles. These tests are designed to resolve key questions about which there is considerable uncertainly among our analysts. The results of these tests will enable us to make better decisions on the issues in each program.

In the case of the attack helicopters, it is very important to determine their survivability against ground defenses when engaged in the "popup" maneuver to acquire targets and deliver the Tow missile. Tests are in progress to measure attack helicopter exposure times under realistic operational conditions. The Army's testing program also includes engineering performance evaluations of the Cheyenne, King Cobra, and Black Hawk helicopters. All of these tests should be completed later this year. We have requested $53.6M in FY 73 for the Attack Helicopter program; $17.1M of these funds will permit us to complete engineering development of the Cheyenne and $36.5M will be used to complete three preproduction R&D prototypes for operational testing. I assure you that none of the $36.5M will be committed until the testing of the other two advanced attack helicopters is completed.

In considering the AX, the Phase I study to date made it clear that the survivability of the AX fuel tanks was a critical factor in determining aircraft survivability and hence effectiveness. This fuel tank survivability will be tested with actual hardware. These tests will be completed by December of this year. Also, we will conduct a flyoff between the two competitive AX prototypes developed by Fairchild-Hiller and Northrop. The flyoff should also be completed by December of this year. We have requested $48M for the AX in FY 73 which will permit us to make an engineering development decision in early 1973, if justified. Once again, no funds will be obligated until the flyoff, the testing, and subsequent analysis have been completed.

Although the Harrier is not being purchased solely for Close Air Support, its relative effectiveness is critically dependent upon the reliability of the aircraft and the Marines' ability to generate high sortie rates in forward areas. Sortie rate testing will be started shortly and will be completed in April of this year. The FY 73 program includes $133M for the procurement of 30 Harrier aircraft. None of these funds will be committed to production until further analysis of the Harrier has been completed.

I recognize that many believe these three programs are competitive rather than complementary. The data now available, extensive combat operations, our Phase I study, and limited testing, do not support this belief but rather reinforces the previous finding that they are complementary systems. Each decision to proceed with any of these three programs will be based on evaluating their contribution to Close Air Support and will specifically recognize not only the characteristics of these three systems but also the cost and capabilities of other airframes—those

in the inventory and those still under development. If our study indicates that the increased effectiveness of any candidate is marginal, we will not hesitate to cancel that program and place our emphasis on the airframes that will make the greatest contribution to Close Air Support.

Sincerely,

KENNETH K. RUSH.

BUDGET REQUEST FOR BOTH AIRCRAFT

Chairman ELLENDER. You have in the budget about $100 million for both programs.

Secretary LAIRD. That is correct, Mr. Chairman.

Chairman ELLENDER. Am I to understand that that sum is necessary to be spent, as suggested in the budget, for the Cheyenne, and for A–X, before you can come to a decision on production of either?

Secretary LAIRD. That is correct.

Chairman ELLENDER. Do you feel that by the end of, say, October, when you test the Cheyenne or when you test the A–X that you would then be able to come to a conclusion as to which one you want?

POSSIBLE PROCUREMENT OF BOTH AIRCRAFT

Secretary LAIRD. I am hopeful that a decision on how to proceed can be made at that time. I cannot give this committee the same assurance that evidently you feel Mr. Packard gave you that only one will be procured, however. I have not given that assurance to this committee.

Chairman ELLENDER. So it is possible that you will wish to procure both?

Secretary LAIRD. That is a possibility, although I understand the Secretary of the Air Force provided a little different view the other day.

Whatever the decision, we would have to come to this committee, and it would have to be approved by this committee.

Chairman ELLENDER. I know there is some rivalry.

Secretary LAIRD. But I am very careful about my credibility before congressional committees. As long as I sat on the Defense Appropriations Committee I don't like to get wired down too tightly.

Before we go forward in production of either one of these particular aircraft systems, we have to come and get your approval. I think that gives us a sufficient check and balance system in this particular area. I am hopeful that we will be able to make a decision that will provide us the most effective close air support system, or systems, given the realities of a constrained defense budget. I think that is a very good possibility, in view of the capabilities being designed into the advanced helicopters and in view of the capabilities expected from the A–X.

I am not trying to be coy about this, but I just don't like to give you a firm commitment along this line as yet.

Chairman ELLENDER. If you don't, we may possibly strike one of them out ourselves.

1973 FUNDINGS

Secretary LAIRD. I think it is too early to make that determination, Mr. Chairman. We are asking for $53.5 million in 1973 for the Cheyenne, all in R. & D. We are asking for $48 million for the A–X, all in R. & D. We are asking for a total of $101.6 million, all in R. & D. for these two particular programs.

We are not making a production decision on either one of them.

I don't want to say we are not going to make a production decision, but I am not going to assure you we are going to make even that one. I just want to be sure that we make the right decision on these two programs. That is the point I am trying to make.

Chairman ELLENDER. Judging from the testimony we had from the Air Force, I think that a decision has been made as far as they are concerned.

Secretary LAIRD. Let me repeat, Mr. Chairman. There has been no production decision made on either the A–X or the Cheyenne. It's my impression that the Air Force is very confident that the decision will be to put the A–X into production.

Chairman ELLENDER. Yes, sir.

Secretary LAIRD. But I have not made a production decision.

Chairman ELLENDER. There is evidence of that same rivalry among the three services.

Secretary LAIRD. Mr. Chairman, I think that rivalry is very healthy, but I want you to know that I have not made a final decision on the close air support aircraft production and the Air Force is aware of that fact.

Chairman ELLENDER. I will find out what the Army has to say about it. Then I will present the matter to the committee for decision.

Secretary LAIRD. I understand your position thoroughly, Mr. Chairman.

AIRCRAFT EXPENDITURES TO DATE

Chairman ELLENDER. I understand that on the Cheyenne alone you have already spent about $280 million. How much have you spent on the A–X?

Secretary LAIRD. We have spent a total of approximately $75 million, I believe it is. It is between $75 million and $80 million, Mr. Chairman. Yes, the exact figure is $76.9 million through fiscal year 1972.

Chairman ELLENDER. Is there anything else you desire to add or put into the record?

Secretary LAIRD. Mr. Chairman, I think that we have covered things fairly well.

SUBCOMMITTEE RECESS

Chairman ELLENDER. It is now almost 12:30. I certainly desire to have other Senators listen to the admiral at 2 o'clock.

Mr. Laird, you need not come back unless you so desire.

(Whereupon, at 12:30 p.m., the subcommittee was recessed to reconvene at 2 p.m. on the same day.)

(Afternoon Session, 2 O'Clock Friday, February 25, 1972)

DEPARTMENT OF DEFENSE

U.S. and Russian Military Powers

STATEMENT OF ADM. THOMAS H. MOORER, U.S. NAVY, CHAIRMAN OF THE JOINT CHIEFS OF STAFF

STRATEGIC FORCES

Chairman Ellender. The subcommittee will come to order.

The stage is yours, Admiral. Proceed.

Admiral Moorer. If I may go off the record.

(Discussion off the record.)

Admiral Moorer. Mr. Chairman and members of the committee, I welcome this opportunity to discuss with you once again the military posture of the United States in relation to the challenges which may confront our Nation during the next 5 or 6 years. There can be no question that during the past 5 years we have witnessed a most dramatic shift in the balance of military power—and particularly strategic nuclear power—between the United States and the Soviet Union. As you shall see in the course of this presentation, we no longer have that predominance of strategic power which for about a quarter of a century has significantly contributed to our avoidance of nuclear war and which has been such a major factor in the defense of Western Europe.

SOVIET MILITARY INCREASES

Indeed, the question now before us is how best to maintain the security of the United States and its allies in the face of the significant increase in Soviet military capabilities. Short of an effective agreement on strategic arms limitations, the present momentum of the Soviet strategic force buildup is likely to carry it well beyond the level currently planned for our forces in the mid or late 1970's.

Chairman Ellender. Has this been made known to our allies?

Admiral Moorer. Yes, sir.

Chairman Ellender. What is their response?

Admiral Moorer. They are quite concerned. This is one of the motivations that prompted them to move forward with this last billion dollars the 9th of December, sir.

Chairman Ellender. I thought there was some other reason.

Admiral Moorer. No, sir. Secretary Laird has been strongly urging them to share the burden to a large degree. We have just begun to move in that direction. But I am the first to say I don't think they have done nearly enough.

Chairman ELLENDER. Their arms have been twisted so much since I have been in the Senate—over 24 years now that I have been on the committee—that I fear their arm might be out of socket.

Admiral MOORER. I do think they are beginning to realize what I am talking about here. I honestly think this is the reason they have seen fit to go forward.

GENERAL PURPOSE FORCES

With regard to the balances between the general purpose forces of the Soviet Union and the United States, the Soviets are slowly coming abreast of us in relation to our tactical air forces and are continuing to widen the gap in relation to our ground combat forces. In addition, a major shift in the naval balance between the United States and the Soviet Union is also taking place. I believe that we still have the edge in overall offensive naval power, particularly in the global reach of our fleets through our carrier and amphibious task forces. However, considering our great dependence upon the seas, in peace and in war, and in view of the rapid growth in the sophistication of the Soviet attack submarine fleet, I must conclude that the U.S. Navy is no longer the unchallenged master of the seas. Indeed, given the large-scale naval shipbuilding programs now underway in the Soviet Union, we will be hard pressed to maintain an appropriate balance in overall naval offensive and defensive power in the years ahead. I will discuss the significance of these changes later in the presentation.

CHINESE NUCLEAR POWER: RUSSIA-CHINA DIFFICULTIES

Over and above the shifting balance of military power between the United States and the Soviet Union during the last 5 years, the Peoples Republic of China (PRC) is now emerging as still a minor, but nonetheless significant, nuclear power.

Chairman ELLENDER. Don't you think that Chinese progress was initiated, in part at least, with assistance from Russia?

Admiral MOORER. Yes, I do.

Chairman ELLENDER. Are they continuing their efforts?

Admiral MOORER. Yes, sir; in fact they are accelerating their efforts.

Chairman ELLENDER. Don't you think that will offset to a degree previous Russian superiority?

Admiral MOORER. I think it is creating a problem for the Soviets.

Chairman ELLENDER. I recall in 1968 concentrations of Russian troops along the border and just north of Lake Bakal.

Admiral MOORER. The Soviets have [deleted] divisions, [deleted] of their total ground and air forces and [deleted] aircraft oriented toward the Chinese border today.

Chairman ELLENDER. Have you any doubt at all in your mind that the difficulties that now exist between Russia and China are real?

Admiral MOORER. No, sir. They are definitely real.

Chairman ELLENDER. After talking to a number of people at Kabarof, which is on the Amdur River as well as elsewhere in the area, I came away with the impression that the Russian people believed that the difficulties between Russia and China were not only real, but that the Chinese would never stop until the Russians returned territory that the Russians took away from the Chinese and that trouble would persist until that is done.

Admiral MOORER. That is likely.

As you shall see during the course of this presentation, the PRC has mounted a most impressive research and development effort—some elements of which have already reached the production stage—to establish itself as perhaps the third most important nuclear power in the world. Also, as in the case of the Soviet Union, the PRC development and production effort is being concentrated in the higher technology areas—ballistic missiles, combat aircraft, and major combatant vessels.

POLITICAL REALINEMENT OF NATIONS

These changes in the realities of the world military power balance will inevitably be reflected in the political realinement of nations. Indeed, this realinement is already well underway. The bipolar world which we have known since the end of World War II is clearly now behind us. The United States and the Soviet Union are still the "kingpins" in the two largest and most important formal military alliances—NATO and the Warsaw Pact—and each is still the power center of an even broader, but looser, association of nations. In the next quarter of a century, the PRC certainly has the potential to emerge as a third major power center, and we cannot rule out the possibility that in the same period Western Europe may emerge as a fourth major power center.

It is not my purpose here, today, to predict how these power centers may relate to one another, and how the nations of the world may realine themselves among them. But this much should be said—the relative military power of the United States in the world has clearly peaked and is now declining. We will no longer have that substantial strategic superiority which in the past provided us with such a generous margin of overall military power that we could, with confidence, protect our own interests and those of our allies worldwide. Henceforth, we will have to plot our course with much greater precision and calculate our risks much more closely. It behooves us, therefore, to examine with the greatest of care and understanding our current and planned military posture in relation to that of other countries.

ALLY ACTIONS IN EVENT OF EUROPEAN WAR

Chairman ELLENDER. You said that Russia is becoming stronger and stronger. If a land war were to develop in Europe, do you think our allies would stick with us?

Admiral MOORER. Yes, sir. [Deleted.]

Chairman ELLENDER. The same as they did in World War II? There were nations who surrendered without even firing a shot.

Admiral MOORER. In my opinion, the answer to your question is yes, they would stick with us.

Chairman ELLENDER. I hope you are right. But while we are helping them, they are beginning to act in a very friendly fashion, not only toward Russia but also China. I do not object to this because it is my sincere belief, and I have repeated it often, that our allies in Western Europe do not in any manner take the situation, such as you are describing, as seriously as we do.

Admiral MOORER. I don't disagree with you too much. I pointed out here that we are in this transition period. We are moving from a bipolar situation to a three-power situation, and ultimately to a four-power situation. We are in this transition period. I agree with you on that.

Chairman ELLENDER. But you recall distinctly, I am sure, that while we were over there holding the line, assisting the allies, they built up quite a flow of trade with countries of the East, including Russia.

Admiral MOORER. That is right.

Chairman ELLENDER. That trade amounted to $4 or $5 billion. Some of our allies found fault with us when we tried to trade with the Russians. All of that added together leads me to believe that when the chips are down, I am not certain that they will all stick with us, even after all we did for them.

INTELLIGENCE RESPECTING PRESENT AND 5-YEAR PROJECTED OVERALL MILITARY BALANCE

Admiral MOORER. It depends a lot on the circumstances, I think. Accordingly, I plan to review in somewhat greater depth than I did last year, the key intelligence bearing on the overall military balance—now and during the next 5 years. In doing so, I will again maintain an attitude of strict objectivity, emphasizing the military capabilities of our opponents rather than their intentions.

As I pointed out last year, while it could be fatal to underestimate the relative strength of one's opponents, it could be seriously detrimental to our national interest to overestimate their strength. Should we do so, we might needlessly undermine the confidence of our people and of our allies in the deterrent power of our military forces, thereby weakening our resolve to stand fast in a crisis. Moreover, our opponents should not be given reason to underestimate our strength. Should they do so, they might not be deterred but, rather, they might be tempted to initiate crises to test our will and resolve. In either case, the prospects for world conflict, rather than for world peace, would be enhanced.

RUSSIAN BUILDUP

Chairman ELLENDER. Admiral, I gave my reasons why I thought the Russians had expanded their military might. Have you any suggestion as to why it is that there has been such a rapid buildup on their part?

Admiral MOORER. Yes, sir. I think I can describe to you what has happened.

Chairman ELLENDER. And why?

CUBAN MISSILE CRISIS

Admiral MOORER. And why, sir. I think that this momentum primarily stemmed from the time of the Cuban crisis. At that time, we had a 3-to-1 or 4-to-1 superiority and the Soviets were forced to remove the missiles from this hemisphere.

Chairman ELLENDER. That was a number of years ago.

Admiral MOORER. Nearly 10 years ago.

But at that point—in 1962—when we were negotiating with the Soviets and finally "got down to brass tacks," Mr. Penkofsky, who was the Soviet negotiator, asked the question, "What does the United States

want us to do?" He was told, "We want you to remove the missiles from Cuba." [Deleted.] It was subsequent to that time that the Soviet buildup became much more evident than it was in the past, sir. It was then when they commenced a very heavy emphasis on military-type reserve and investment, when they commenced construction of shipyards, and in my view that was about the period when they made the decision that they were going to take those actions necessary to achieve superiority.

That is my personal opinion.

Chairman ELLENDER. All of this buildup, then, that you speak of must have evidently taken place in the last 9 years.

Admiral MOORER. Just about; yes, sir, that is right. That is why all of their equipment is new. Almost without exception, their ships are new. Generally speaking, their aircraft are new.

Senator YOUNG. Would you yield, Mr. Chairman, at this point? [Deleted.]

Admiral MOORER. [Deleted.]

[Colloquy deleted.]

RUSSIAN OBJECTIVE TO DOMINATE WORLD

Chairman ELLENDER. Is it your opinion that this was being done in order to "take over" the United States?

Admiral MOORER. I think the basic objective of the Government of Soviet Russia as opposed to the people of Soviet Russia is to dominate the world. I don't think they have ever changed from that objective. I don't think they want to do this through war. They would prefer to do it through political and economic means, gradually extending their presence throughout the world. But, on the other hand, they must have military strength in order to move forward with this program. I think the record speaks for itself. They have now moved into the Mediterranean and Indian Oceans.

Chairman ELLENDER. You don't mean to dominate, do you? Don't you mean to secure economic superiority over us?

Admiral MOORER. That is what I mean by "domination"—political, economic, and military superiority—Yes, sir.

Chairman ELLENDER. We were doing that long before I came to the Senate.

Admiral MOORER. Yes, sir.

Chairman ELLENDER. We expand our trade. We seek economic benefits. Isn't it natural for them to do that?

Admiral MOORER. Let me say this, Mr. Chairman, if the Soviets had acquired the nuclear weapon before we did, and we would have had an opposite situation existing, I fear to think of the consequences.

Chairman ELLENDER. If Hitler had possessed the atomic bomb, he might well have used it.

Admiral MOORER. That is right, but Hitler does not exist and the Soviet Union does today.

U.S. OBJECTIVE TO PROTECT ITS INTERESTS AND DETER WAR

Chairman ELLENDER. If it has ever been our idea to defeat communism by force, there is no chance to do that.

Admiral MOORER. I don't think that our objective is to defeat communism by force because, in the first place, the United States has never acquired any territory as a result of war and we don't have any such goal. But, on the other hand, we certainly want to protect our interests and deter war.

SOUTHEAST ASIAN CONFLICT

Chairman ELLENDER. Many believe that we try to impose ourselves to some extent on Southeast Asia.

Admiral MOORER. I think the initiative in that area was taken by the Communists.

Chairman ELLENDER. In what manner?

Admiral MOORER. The North Vietnamese are the ones. Even today in South Vietnam, Cambodia, and Laos—if the North Vietnamese went home, we wouldn't have a problem in Southeast Asia.

Chairman ELLENDER. If we had not initially sent advisers there, we would never have become deeply involved.

Senator ALLOTT. Mr. Chairman, what you say may be true, but what is not being said is that before the ink was dry on the Geneva Convention, North Vietnamese were in South Vietnam organizing the Vietcong, organizing Communist cadres, and exercising a terrorist warfare upon the people of South Vietnam.

Chairman ELLENDER. That was after the French——

Senator ALLOTT. That was 1953, 1954, and 1955. It was 10 years before we started any buildup in South Vietnam.

Chairman ELLENDER. I visited that area long before the French left there. The French had no qualms about removing the God-given natural resources of the country. As far as I could see, the Vietnamese did not like the French very much.

Admiral MOORER. That is all history, but in connection with what Senator Allott said, the North Vietnamese have been continuously in Laos. The North Vietnamese were the ones that left their country and moved into other countries. No one has been inside North Vietnam. No one has invaded North Vietnam.

They are the ones that have left their country to invade other countries.

Senator YOUNG. I would agree with Senator Ellender on this score. I think we would have been better off if we had stayed out of Southeast Asia.

Admiral MOORER. The decision to go into South Vietnam was, as you know, a political decision. I have several ideas about this, because I have been heavily involved in it for 7 years. But I wouldn't comment on what has happened so far as history is concerned. I will always try to look to the future and make things better in the future.

Chairman ELLENDER. If we had limited our intercession in South Vietnam to economic development, I believe that we would have stood a chance of success. But when we sent military advisory groups there, we gave the Government of North Vietnam an excuse to accelerate their own activities in South Vietnam.

For a number of years we had attempted to help every free nation economically. We attempted to do the same thing in South Vietnam. If we had continued that course of providing economic assistance to

South Vietnam and had not tried to assist President Diem in strengthening his army, the situation might have been different today. I have long held this view, which is contained in my reports.

Senator ALLOTT. Mr. Chairman, I want to say one thing. I can't let this go without making my part in this hearing meaningful. We may have made a mistake in going there, but I think your supposition ignores the political and actual facts of Southeast Asia. I believe I can prove the statement I made awhile ago about the activities of the North Vietnamese, not only in Vietnam, but in Laos and Cambodia from 1954 on. I would like to send you a speech that I made relative to the activities of the North Vietnamese against their own people during this time.

EFFECT OF U.S. INTERVENTION: FREE NATIONS

We may have made a mistake in going there, but it does not do any good today—as Secretary Laird pointed out numerous times—to reiterate our mistakes. The facts are that if we had not gone in there—I won't argue whether it was worth it or not—there would be no free Southeast Asia of any consequence, including Thailand, today.

Admiral MOORER. And Indonesia.

Senator ALLOTT. And Indonesia. If we had not taken steps in that area, Indonesia, Malaysia, Thailand, Cambodia, Laos, South Vietnam, all would have been down the drain and we would be looking at the Philippines today as our farthest outpost. That is in 1972. We may have made a mistake in going in there. I won't argue about that. But what I have cited are the facts as to the situation that existed when we went in there.

SOUTH VIETNAM GOVERNMENT AFTER WITHDRAWAL OF U.S. SUPPORT

Chairman ELLENDER. I am afraid that once American support is withdrawn, the Vietnamese will return to the same type of government as previously existed. Their knowledge and appreciation of democratic methods are not very deep rooted.

NORTH VIETNAM ORGANIZATION OF NATIONAL LIBERATION FRONT

Senator ALLOTT. I want to state one other observation relative to the timeframe you are talking about, Mr. Chairman. I would like to remind you that as a statement of fact, the NLF, National Liberation Front, was organized to provide a political front upon the activities of the Vietcong, which had been carried on for years. The NLF was organized in 1961, by the North Vietnamese. The Vietcong themselves had nothing to do with the NLF at the time of its organization, so that not only had activities been carried on for years, which is a fact people like to conveniently forget, but the stamp of political organization was not provided by the North Vietnamese until 1961, when they organized the NLF, which was 3 years before any major buildup by the United States.

FRENCH OCCUPATION OF INDOCHINA

Chairman ELLENDER. I return to what I stated a moment ago. The French, during the period they occupied Indochina, utilized the natural resources for their own benefit. I believe that selfish practices on the part of Europeans brought on much of the difficulty present today.

Admiral MOORER. That may be so, sir, but certainly you cannot say that about the United States.

Chairman ELLENDER. That is the reason for my belief that we should have avoided a military confrontation. The French initiated this type of approach, to their own undoing. If we had limited our actions to providing them with economic assistance, perhaps the situation would have been better than it is today.

UNITED STATES, RUSSIAN, AND CHINESE FORCE PROJECTION CHANGES

Admiral MOORER. I will also invite your attention to the more important changes which have taken place since last year in the projections of both our forces and those of our principal opponents. Some of these changes simply reflect the availability of more accurate data; others involve matters of substance, for example, changes in programs.

Before I turn to the first set of charts, I would like to set forth some key caveats.

First, the U.S. force data, used in the comparisons which you are about to see, are drawn from the currently projected 5 year defense program. The Soviet and PRC data are based on intelligence estimates which inherently are subject to some degree of uncertainty. Consequently, they leave room for differences in judgment among equally well-informed intelligence specialists.

Chairman ELLENDER. Admiral, who participates in the preparation of the national intelligence estimates?

Admiral MOORER. The national intelligence estimates are done by a board participated in by DIA, CIA, and all the intelligence organizations we have. Frequently, they do not treat every item which I have on this chart so, in that case, I had to go to DIA to get their estimate. This is not for what they have today, but for the future.

Chairman ELLENDER. Please proceed with your statement, Admiral.

ACCURACY OF ESTIMATES

Admiral MOORER. Second, our intelligence specialists can estimate, with a fair degree of precision, the forces our opponents will have operational in the next year or so. Beyond that point, the estimates become less certain. This is true because we have a good idea of the elapsed time between the start of deployment and operational status of many major weapon systems. However, we don't know how many more units they will actually start in a given future period, nor do we know their force goals.

Third, while our intelligence specialists cannot predict quantitative deployments very far into the future, they can provide a good indication of the kinds of weapon systems which may be deployed several years from now. This is so because, from our own R. & D. effort, we have a good understanding of the state of the art and the technological problems involved. Beyond 5 years, it is extremely difficult to say anything very precise about the forces of other nations since the data are inherently "unknowable." These foreign governments, themselves, may not have made any firm decisions on force deployments even over the next 5 years, much less beyond that point in time. Consequently, all we can do in this case is to postulate the kinds of programs

which may be economically and technologically feasible, and strategically desirable, for other nations to pursue. But, we cannot state, with any great degree of confidence, which of these programs they may actually pursue.

Personal Judgments

Finally, I should like to point out that some degree of personal judgment cannot be avoided in comparing the military posture of one nation with another. Consequently, some of my colleagues may disagree with me on specific details, but I believe there is a general consensus within the Defense Department on the fundamental aspects of these comparisons. For example, while there may be some disagreement on which particular tanks should be included in the medium and heavy tank category for comparative purposes, there is no question but that the Soviets have far more heavy and medium tanks than we have. Conversely, no matter how we choose to classify helicopters, we have far more than they have.

Strategic Forces

With these cautions in mind, I would now like to turn to the first set of charts which deal with the strategic balance between the United States and the Soviet Union. I have supplied each of you with a set of these charts to assist you in following my briefing.

As Secretary Laird pointed out, the total force concept under a strategy of realistic deterrence places primary reliance on U.S. strategic forces for the deterrence of strategic nuclear war. Indeed, an assured capability to deter such a war is the essential prerequisite for the deterrence of all lesser types of wars involving conflicting interests with the Soviets, down through the entire spectrum of conflict. Accordingly, our strategic forces are the keystone of our deterrent strategy and provide the indispensable foundation for the collective defense of the free world upon which rests the ultimate security of the United States. That being the case, the appropriateness and sufficiency of our strategic forces must be our foremost concern.

Evolution of U.S. and Soviet Missile Forces

Before we examine the new force projections, I believe it would be useful to review briefly the evolution of U.S. and Soviet intercontinental strategic missile forces over the last two decades, particularly, the developments which have taken place during the last year.

Shown on chart 1 are, what I would characterize, the three generations of U.S. and Soviet strategic missile forces. In the case of the United States, these three generations coincided roughly with the three decades—the 1950's, 1960's, and 1970's. That is to say, our first generation missiles started deployment, for the most part, in the late 1950's; our second generation, in the 1960's; and our third generation, in the 1970's. The Soviet generations have lagged behind ours in calendar time—the first appeared, for the most part, in the early 1960's; the second, in the last half of the 1960's; and the third may just now be reaching operational status.

All of our first generation missiles, except for the Titan II's, have long since been phased out of the force. The Soviets, in contrast, have retained most of their first generation missiles. This tendency to retain

old systems is one of the essential differences between U.S. and Soviet force planning policies. We tend to phase out the old as we bring in the new; the Soviets tend simply to add the new to the old. Because our operating costs are so much higher than those of the Soviets, particularly the cost per man, we emphasize total force capability rather than just numbers.

Our second generation missile force marked a complete shift to solid fuel; the Soviets, except for the relatively small SS–13 program, stayed with the liquid fuel. Included here on the U.S. side are the Minuteman I and II, and the Polaris A–1, A–2, and A–3. Some of the earliest of these U.S. missiles have already been phased out. Included on the Soviet side are the SS–9 MOD's (modifications) 1, 2, and 3; the SS–11; the SS–13; and the SS–N–6 SLBM. All of these Soviet missiles deployed to date are still in the force. However, except for the SS–N–6, which is still being deployed at a rapid rate—about nine to 10 submarines (with 16 missiles each) per year—deployment of these second generation Soviet missiles has probably been completed.

Chairman ELLENDER. When did we initiate our ICBM system?

Admiral MOORER. In the 1950's.

Chairman ELLENDER. When did they start theirs?

Admiral MOORER. They started theirs a little later, I would say in the late 1950's. We started ours in the early 1950's. But they really did not begin to deploy weapons of any quantity until the middle and late 1960's.

Chairman ELLENDER. That was after the Warsaw Pact was consummated.

Admiral MOORER. Yes, sir.

Chariman ELLENDER. And NATO?

Admiral MOORER. Yes, sir.

Chairman ELLENDER. It is once again a matter of action and counteraction.

Admiral MOORER. These systems, particularly missile systems, are associated in part with their space program. I think this is one thing to bear in mind throughout.

Our third generation strategic missiles, Minuteman III and Poseidon, mark another significant stage in the evolution of our strategic missile forces—both are equipped with multiple independently targetable reentry vehicles (MIRV's). We believe that the third generation Soviet land-based missile force will be characterized by multiple reentry vehicles (MRV's) and probably by MIRV's as well. We are now well along in the deployment of our third generation missiles. How far the Soviets have progressed with the third generation missile programs listed on this chart is still uncertain.

As you are no doubt well aware, the Soviets have been engaged for some time in a very extensive and vigorous flight-test program involving improved versions of the SS–9, SS–11, and SS–13, as well as an entirely new SLBM, the SS–NX–8. Moreover, they are now constructing entirely new ICBM silos, and appear to be developing two new or greatly modified ICBM systems. However, we still don't know what missiles they plan to install in these new silos, nor do we know the extent to which they plan to deploy new or improved missiles.

In view of the grave importance of these questions to our future security, I would now like to present to you in some detail the essen-

tials of what we do know about the status of these new Soviet missile programs.

UNITED STATES AND SOVIET ICBM FORCES

Drawn to scale on chart 2 are the principal United States and Soviet ICBM systems of concern here. Our ICBM's have not been designed to give them a hard-target kill capability, and this is an important point to bear in mind. The Titan II has a large warhead, but lacks accuracy. Our Minuteman missiles have better accuracy, but carry relatively small warheads. The MIRVed version of the Minuteman III was designed as a soft-target weapon to increase target coverage and to hedge against Soviet ABM defense improvements.

The Soviet ICBM force still includes more than 200 SS–7's and SS–8's on launchers, most of which are deployed in a soft configuration. Although armed with relatively large warheads, these missiles do not have sufficient accuracy to give them a good hard-target capability.

Chairman ELLENDER. How does their SS–7 compare with our first ICBM, the Atlas, that used liquid fuel as I recall?

Admiral MOORER. Yes, sir, the Atlas was the first one. It was also liquid propelled. Of interest is the fact that we are going almost exclusively to solid propellants while the Soviets are still sticking to liquid. They have only one ICBM—the SS–13—that is propelled with solid propellant and they only have [deleted] of those.

Chairman ELLENDER. How many of those do they have operative?

Admiral MOORER. [Deleted] out of 1,527.

With regard to the SS–9, there are actually four known versions of that missile. The MOD 1 and 2 have a single large warhead; the MOD 3 is the FOBS or depressed trajectory version; the MOD 4 carries three warheads.

As can be seen from the chart, the Soviet SS–9 is a very large missile compared to our Minuteman. In fact, even the SS–11 and SS–13 are larger than Minuteman. But at this time, only the SS–9 MOD's 1 and 2 appear to have a hard-target kill capability. The MOD 3, because of its relatively large CEP is considered a soft-target weapon. The MOD 4 is still an enigma. (CEP, circular error probable, is the radius of a circle within which half of the warheads are expected to fall.)

As I noted last year, the Soviets, from August 1968 through November 1970, conducted a large number of tests with the MOD 4. Although all of the technical data on the tests conducted in late 1970 had not been completely analyzed at the time I appeared here last year, our intelligence specialists agreed that it was reasonable to conclude the Soviets were working on a MIRV system. Further analysis during the past year of all of the available flight-test data has now led to the conclusion that regardless of whether the Soviets were, in fact, working on a MIRV, the MOD 4 has thus far failed to demonstrate the actual achievement of such a capability. However, the MOD 4 could be deployed as an MRV.

While the MIRV capabilities of the current SS–9 MOD 4 system have not yet been demonstrated, the intelligence specialists are in agreement (as they have been for a number of years) that the Soviets will eventually develop MIRV's for their ICBM's. If the Soviets are still working on a MIRVed version of the SS–9 MOD 4, a system

based on that technology could be available for deployment relatively soon—providing, of course, that the tests are successful. If they are developing a new large MIRVed ICBM based on a different technology, considerably more time for testing would be required.

With regard to the SS–11, improved versions have been under active testing since the second half of 1969. We believe the improvements being tested are designed to enhance the penetration capabilities of the SS–11 against ABM-defended urban/industrial and soft military targets.

Testing of an improved version of the SS–13 also continued in 1971. We believe the purpose of these tests is to improve the missile's accuracy.

Finally, there still remains the possibility that the Soviets may develop and deploy a mobile ICBM. However, a mobile ICBM is not expected to be available for deployment for several years.

Our greatest uncertainty at this time with respect to the Soviet ICBM force is the ultimate objective of the new silo construction program. We don't know how many more of these silos the Soviets intend to build; nor do we know what particular missiles they intend to install in them. If the two new or greatly modified ICBM systems (now believed to be under development) are related to these new silos, this construction program may presage another major expansion and/or modernization of the Soviet ICBM force. If these new or modified ICBM's also turn out to be MIRVed systems with significantly improved CEP's, the potential threat to our Minuteman force, which has been of such great concern to us over the last few years, could become a reality. The severity of the threat, however, would depend on the number, accuracy, and yield of the RV's carried by the new missiles.

Let me hasten to add that this assessment is not meant to be a forecast. It is simply one of the more likely possibilities which must now be taken into account, particularly in the absence of a meaningful agreement to limit the deployment of missiles.

In view of these uncertainties, it is extremely difficult at this time to project the size and character of the Soviet ICBM forces, even 5 years into the future. As shown on chart 3, the Soviets are expected to have about 1,550 operational ICBM's on launchers by mid-1972, including the SS–11's in the MR/IRBM complexes. We will have 1,054 ICBM's at that time.

Beyond mid-1972, the projections become increasingly less certain. If the Soviets expand and modernize their ICBM forces as described earlier, that is, with new or greatly modified missiles carrying accurate MIRV's, they could pose a threat to our Minuteman force several years hence.

Accordingly, prudence demands that we now hedge against that real possibility. The first steps are already being taken, or are provided for in the fiscal year 1973–77 program:

1. We are upgrading the "hardness" of our Minuteman silos.
2. We are installing a command data buffer system in all Minuteman III squadrons to increase the flexibility of the force.
3. We are moving forward with the Safeguard system in the Minuteman fields.

4. We are proceeding with the development of a prototype Hard-site defense system. The prototype system will be tested as an option to supplement planned ballistic missile defenses in the event such a requirement develops.

The U.S. ICBM force will be maintained at about its present level over the next several years. The number of Minuteman III's, however, will increase to 550 by mid 1975. By that time, all of the Minuteman I's will have been phased out of the force.

U.S. Reliance Upon Land- and Sea-Missiles, Aircraft and ULMS

Chairman Ellender. In our discussion of the ULMS acceleration program I think it was clearly established that our current plans do not call for the deployment of any additional land-based ICBM's.

Admiral Moorer. That is correct, sir. Our land-based program is being improved in terms of MIRV and rapid targeting and hardening, but we do not have, at this time, a program for more land-based systems.

Chairman Ellender. Proceed.

U.S. and Soviet SLBM Forces

Admiral Moorer. Drawn to scale on chart 4 are the principal United States and Soviet SLBM's now operational in the intercontinental strategic forces.

The Soviet SS–N–5 is presently deployed in the older G- and H-class ballistic missile submarines. The SS–N–6 has thus far been deployed in the Y-class submarines—16 launchers each.

As noted earlier, the Soviets have been actively testing a new, longer range SLBM, the SS–NX–8. If this test program has now been successfully completed, the SS–NX–8 may soon be ready for operational deployment.

The Soviet SLBM's shown on this chart have a single warhead. However, given the technology which we believe the Soviets are acquiring, in their ICBM programs, it is possible that MIRVed SLBM's might become available by the mid or late 1970's.

With regard to the U.S. SLBM force, the Polaris A–2 carries a single warhead, the Polaris A–3 carries MRV's, and the Poseidon carries MIRV's. We plan to retain all 41 of our ballistic missile submarines, and to convert 31 of them to Poseidon. The conversion will be completed by mid-1976, at which time the force will consist of 31 Poseidon and 10 Polaris A–3 submarines.

In addition to completing the 31-boat Poseidon conversion program, we now propose to accelerate the development of the new Undersea Long-range Missile System (ULMS). The ultimate purpose of this program is to provide an efficient, survivable, sea-based strategic offensive system, capable of launching long-range ballistic missiles from improved design, quieter submarines.

We believe this action is necessary, not only because of the continuing buildup of the Soviet strategic missle forces, but also because of the expanding Soviet ASW capabilities. As I pointed out last year, the Soviets are believed to be working on a number of new ASW developments which could significantly improve their antisubmarine

warfare capability in those waters in which our submarines are now required to operate. Therefore, as the Soviet antisubmarine warfare capability improves, we need to expand our area of operations in our constant effort to maintain our survivability. Furthermore, our present submarines are aging and by the time the ULMS submarines could be made available, our first Polaris submarines would be about 20 years old.

The planned IOC of the ULMS submarine itself has been moved up from fiscal year 1981 to fiscal year 1979. Initially, a shorter range version of the new ULMS missile, designated ULMS–1, will be developed. This will give us the option to deploy the ULMS–1 in the existing Poseidon submarines, if the Soviet ASW threat should make that course of action desirable.

For possible later deployment, we are initiating planning for the longer range version of the ULMS missile, designated ULMS–2. The missile tubes of the new submarine will be sized to accommodate both the ULMS–1 and the ULMS–2.

None of the Soviet SLBM's now have sufficient yield and accuracy to pose a threat to our land-based missiles. They could, however, pose a threat to our strategic bombers.

Our current SLBM's are not designed for attack against hard targets. The Poseidon, with its many MIRV's, was specifically developed to penetrate a sophisticated Soviet ABM defense employing long-range exoatmospheric missiles such as the Galosh deployed around Moscow, relying upon the exhaustion of interceptors rather than upon penetration aids. The warheads carried by the Polaris A–3 are not MIRVed and, therefore, would present a single aim point to an exoatmospheric ABM missile, such as the Galosh. The purpose of the A–3 was to achieve a better coverage of a large urban target with a single missile.

Shown on chart 5 is a comparison of United States and Soviet SLBM forces. By mid-1972, the Soviets will have a total of about 580 SLBM launchers, including launchers in their older ballistic missile submarines. Inasmuch as the 42d Y-class submarine may have already been started and the rate of production is running at about 9 to 10 per year, the Soviets can be expected to overtake us in the total number of SLBM launchers by approximately mid-1973. And, by mid-1974, their Y-class submarine force alone is expected to surpass our total force by 41 Polaris/Poseidon submarines.

Thus, barring a specific agreement to limit the deployment of SLBM's or a unilateral decision to halt the construction of new ballistic missile submarines, the Soviets could far exceed us in the number of SLBM launchers by mid-1977. The ultimate composition of that force, however, is far more difficult to project. It seems reasonable to assume that, in addition to the SS–N–6, the force will almost certainly include the SS–NX–8. It is also possible that a new, longer range SLBM for the Y–class submarines may be deployed by that time. But regardless of what new missiles may be deployed, our intelligence specialists believe that by the mid or late 1970's the Soviets could have MIRVed SLBM's in their operational forces. These could be entirely new missiles, or MIRVed version of the SS–NX–8 and the SS–N–6.

The number of U.S. SLBM launchers will remain constant through mid-1977, with a total of 656. But, as I noted earlier, the Poseidon conversion program will be completed by mid-1976, at which time the

force will consist of 496 Poseidon and 160 Polaris A–3 launchers. The first ULMS submarine is not planned to become operational before mid-1978.

Chairman ELLENDER. How many warheads are carried on each Poseidon missile?

Admiral MOORER. We have the option of putting in [deleted]. We normally carry [deleted]. But obviously, if you include [deleted] warheads, then the range drops down.

Senator ALLOTT. I want to be sure of one thing on these deals. [Deleted] the yield for all [deleted] warheads?

Admiral MOORER. Yes, sir.

Senator ALLOTT. By way of comparison, the Nagasaki bomb was less than 20?

Admiral MOORER. Yes, sir.

LONG-RANGE BALLISTIC MISSILE WARHEAD

Senator YOUNG. Could I ask you this question: Are our Poseidon missiles constructed so that a conventional warhead can be placed on them?

Admiral MOORER. No, sir, you could never make an effective system out of a long-range ballistic missile with a conventional warhead, because you are dealing in CEP's at such distances that you could not carry a sufficient amount of a conventional explosive in the warhead to make it worth while.

CONVENTIONAL WARHEADS ON SHORT-RANGE MISSILES

Senator YOUNG. Are the short-range missiles that the Russians have equipped with a conventional warhead?

Admiral MOORER. Yes, sir. Now, you have something different. In that case, you have on certain cruise missiles what they call terminal guidance. It directs and homes in on a certain point, whereas a ballistic missile—what we are talking about now—once it is committed, there is nothing that you do to it; it goes all the way on its own on a ballistic trajectory.

Senator YOUNG. I understand that artillery weapons of the NATO countries are equipped with either conventional or nuclear warheads, but weapons like the Sidewinder are all conventional, aren't they?

Admiral MOORER. Yes, sir.

Senator YOUNG. You could not put nuclear warheads on them?

Admiral MOORER. Not on those missiles.

Senator YOUNG. Are any others optional?

Admiral MOORER. Yes, sir; we have one missile that has a nuclear capability.

Senator YOUNG. The reason for asking this question is that I wonder if you could have a conventional warhead?

Admiral MOORER. Yes. We have plenty of conventional weapons.

UNITED STATES AND SOVIET STRATEGIC BOMBER FORCES

The major uncertainty in the intercontinental bomber area involves the primary mission of the new Soviet swing-wing bomber, now designated the Backfire. This is a large aircraft, almost 2½ times the gross takeoff weight of the FB–111, and approximately two-thirds the size

of our planned B–1. It is a supersonic bomber, and it probably can be refueled in flight. With refueling it could reach virtually all U.S. targets.

We do not yet know whether the Backfire is intended for the peripheral or the intercontinental attack mission, or for both. In any event, we believe this aircraft has considerable growth potential and that later versions could have significantly improved capabilities. Based upon the scope and pace of the development program, we believe the Backfire could become operational in the next few years.

As shown on chart 6, the United States still has a substantial lead over the Soviets in numbers of intercontinental bombers. This advantage is expected to continue even if the Soviets decide to deploy the Backfire for the intercontinental mission.

Although the Soviet medium bombers are not considered a part of the intercontinental forces, I have included them in this chart for reference.

By mid-1972, our intercontinental bomber force will consist of about 400 (UE) B–52's and 60-plus FB–111's. We plan to maintain that force through the late 1970's, by which time the B–1 could be ready for deployment. The scope of the deployment, however, will be decided after the B–1 has been flight tested. The first flight is scheduled for April 1974.

United States-Soviet Strategic Offensive Balance

As I noted last year, there are three general quantitative measures which can be used to summarize the overall strategic offensive balance between the United States and the Soviet Union—numbers of delivery vehicles, megatons, and warheads. No one of these measures, alone, provides a valid comparison. All three must be used in an appropriate combination, together with other factors such as prelaunch survivability, accuracy, range, and the ability to carry penetration aids.

For example, numbers of delivery vehicles and prelaunch survivability are of great importance in assessing the second strike capabilities of the respective forces. Warhead yield (that is, megatons) and accuracy are key parameters in assessing hard-target kill capabilities. Also, numbers of reentry vehicles (that is, warheads) and penetration aids have a great bearing on the ability of the missile forces to penetrate defenses.

Shown on chart 7 is a comparison of the total numbers of United States and Soviet intercontinental strategic offensive delivery vehicles through mid-1972. I should point out that in contrast to chart 5, which includes all completed ballistic missile submarines, this chart includes only those which are "deployable"; that is, submarines in conversion or overhaul are excluded since they are not available for immediate deployment. Because a number of our submarines are under conversion to Poseidon, and because most of the Soviet SLBM force is relatively new, this adjustment has a greater impact on the U.S. numbers than on the Soviet numbers, particularly in the near term.

As can be seen on chart 7, the Soviets by mid-1972 will have already overtaken us in this measure of the strategic force balance. Short of a prompt agreement to limit the numbers of delivery vehicles, they will inevitably widen their lead over the next few years.

The Soviets are already far superior to us in total intercontinental strategic offensive megatonnage, the second measure of the strategic balance. This measure represents the total estimated yield of all the weapons expected to be loaded in the delivery vehicles included in chart 7.

U.S. megatonnage declined sharply from 1966 to 1970, reflecting, in large part, a reduction in the number of heavy bombers. U.S. megatonnage will continue to decline over the next few years as our missile forces are converted to MIRV's.

The future trend in Soviet megatonnage will depend importantly on the extent to which they convert their missile forces to MIRV's. In any event, the Soviets are expected to continue to maintain their predominant lead over us in gross megatons.

Only in numbers of strategic offensive warheads is the United States likely to maintain its lead over the Soviet Union during the next 5 years. Even here, the Soviets have the potential to overtake us since their missile forces have considerably greater "throw weight" or payload capacity than our missile forces. Thus, if they move vigorously into MIRV's, both in their ICBM's and SLBM's, they could considerably narrow our lead in terms of numbers of warheads by the late 1970's.

United States and Soviet Strategic Defensive Forces

With regard to strategic defensive forces, the Soviet Union has held, for many years, not only a commanding numerical lead over the United States, but certain qualitative advantages as well. As I indicated last year, they now far surpass us in the number of air defense radar sites, command and control facilities, surface-to-air missile launchers, and interceptor aircraft. Furthermore, they have the only operational ABM system in the world today.

Although we are undertaking some major programs to modernize our air defenses—namely, the airborne warning and control system (AWACS), the over-the-horizon backscatter (OTHB) radar, an improved manned interceptor (IMI), and the SAM–D—we have no plans to match the Soviet Union in terms of numbers. Our Safeguard ABM system will not achieve an initial equipment readiness status until fiscal year 1975.

There is, of course, a very basic reason for this marked asymmetry in the strategic defensive forces. Our intercontinental bomber forces have always been more capable than those of the Soviet Union; thus, they have a greater need for heavy air defenses than we have. Nevertheless, the Soviet bomber force, even now, presents a significant threat. Should the Backfire be deployed for the intercontinental mission, this threat could become much more serious in the years ahead. Accordingly, for this and other reasons (that is, to insure the sovereignty of our air space), we must maintain a modern and effective air defense system.

Shown on chart 8 are the United States and Soviet home defense interceptor forces. As you can see, both forces are declining in terms of numbers. Ours will level out this year at about 500 aircraft in units. The Soviet force is expected to continue to decline as the older aircraft are replaced by new and more capable interceptors now in production. We have not produced any new interceptors since 1961, when the last of the last of the F–106's was delivered.

By mid-1972, the Soviets will have somewhat over 3,000 interceptors in operational units. The three oldest types (MIG-17's and MIG-19's, and YAK-25's) introduced into the forces prior to 1957, will comprise about two-fifths of the total; the SU-9's, introduced in 1959, about one-quarter; and the four newest types (Firebar, Fiddler, Flagon A, and Foxbat) introduced since 1964, some 2 years apart, about one-third. Five years ago, in mid-1967, the three oldest types accounted for about two-thirds of the total force, and the newest types (Firebar and Fiddler) about one-tenth.

The oldest types have little capability over 50,000 feet. They are largely gun-armed and are, therefore, limited to tail attacks at ranges of one-half mile or less. Most of the SU–9's are armed with first-generation air-to-air missiles which have limited capabilities. The newer aircraft are all-weather supersonic interceptors armed with advanced air-to-air missiles and fire control systems. Hence, they have a much better capability than the older types.

The Soviets now have a few airborne warning and control aircraft with a limited lookdown capability over water. Our intelligence specialists believe that they will eventually develop a new AWACS with a lookdown capability over land, as well as water. If they equip their advanced interceptors with a lookdown/shootdown radar/missile system, these aircraft operating in conjunction with a new AWACS could pose a serious threat to our bombers. Accordingly, we are now developing the subsonic cruise armed decoy (SCAD) which could be used by both the B–52 and the B–1 to help them penetrate such a Soviet lookdown/shootdown air defense system.

Shown on chart 9 are the United States and Soviet home defense surface-to-air missile (SAM) forces. The number of U.S. SAM's will continue to decline until fiscal year 1973, and then level out at about 500 launchers. We believe that the Soviets may also have started to phase out some of their older SAM launchers as the newer SAM systems, the SA–3 and SA–5, are deployed. Even so, the Soviets will certainly continue to have a far larger SAM force than we over the next 5 years.

The Soviet ABM–1 system now deployed around Moscow consists of four operational complexes, each with 16 Galosh missile launchers and Try Add engagement radars. Target acquisition and tracking is provided by a large, phased-array Dog House radar near Moscow. Early warning is provided by a number of large, high-powered, phased-array Hen House radars located around the periphery of the Soviet Union.

After a lapse of several years, work has now been resumed at some of the previously started but uncompleted ABM complexes around Moscow. It is possible that new types of missiles and radars may be installed in these complexes. As I pointed out last year, the Soviets are continuing their development of improved ABM radars and interceptor missiles, and this effort is moving forward with great vigor.

Nevertheless, barring the upgrading of the SA–2's and the SA–5's to an ABM capability, neither the current nor projected level of Soviet ABM interceptors would pose much of an obstacle to the type of attack we could mount against their defended targets. The Moscow system, even with improved radars and more and better interceptors,

could still be saturated by a very small part of our total missile force. In any event, the programed Minuteman III and Poseidon forces, with their large numbers of reentry vehicles, provide a hedge against a future large-scale Soviet ABM deployment.

The approved U.S. Safeguard program at the four Minuteman sites will provide two perimeter acquisition radars (PAR's), four missile site radars (MSR's), plus a sizable number of Spartan long-range interceptors and Sprint short-range interceptors on launchers. The first site is scheduled to become operational in fiscal year 1975. Two more sites should be operational by mid-1977, and all four sites the following year. The full Safeguard system would include a total of 12 sites, which would provide a thin area defense for the 48 contiguous States and the District of Columbia.

PRC Strategic Forces

As I noted at the beginning of this statement, the Peoples Republic of China has now clearly achieved nuclear power status. The production of fissionable material continues to expand as new facilities come online. The nuclear weapons testing program, to date, has clearly demonstrated China's ability to develop and produce nuclear warheads. We believe that such weapons are now in the operational inventory. Several types of delivery vehicles are available to carry these weapons for the peripheral attack mission. I will discuss the aircraft delivery systems later in connection with the theater nuclear forces; however, the ballistic missile delivery systems need to be discussed here because of their implication for the intercontinental attack mission.

It is clear from the available evidence that the PRC is pursuing a very cautious and deliberately paced effort in the ballistic missile field—moving slowly, but steadily, to longer and longer range missiles, and from the cryogenic to storable liquid fuels. The PRC has been testing an MRBM for a good many years and can probably deploy this weapon any time they choose. Several years ago they began to test an IRBM, and this missile may now be ready for deployment. A multistage booster based on this IRBM was probably used to orbit the PRC's two space satellites. If this was the case, the PRC may also be developing a longer range IRBM based on that multistage booster. Such a missile could not reach the Continental United States, but a reduced-range test of a true ICBM system may have already occurred.

Inasmuch as an ICBM cannot be tested at full range within the confines of the PRC, we would expect that eventually this new missile, if it is indeed an ICBM, will be tested out into the Pacific or the Indian Ocean. If it is so tested, we will know much more about its characteristics than we do now. It is estimated that this possible ICBM could reach an IOC as early as 1975, but more likely a year later. Its range, carrying a three MT warhead, could be about 6,000 nm, sufficient to reach all major targets in the Continental United States.

In addition to these liquid fuel missiles, we believe the PRC has also been working for some time on a program for the development and production of solid fuel missiles. While we do not as yet have a good basis for estimating an IOC, a solid fuel MR/IRBM class missile and/or a solid fuel SLBM probably would not be available

for deployment before the mid-1970's. The PRC has one Soviet-type G-class diesel-powered missile launching submarine which they built during the early 1960's, but, as far as we know, it has never been equipped with missiles. If the PRC is indeed developing a solid fuel SLBM, it is reasonable to assume that they may use this submarine as a test platform. No other PRC ballistic missile submarines are known to us, however, we cannot preclude the possibility that one or more may be under construction.

To hedge against this potential PRC ballistic missile threat, we are holding open the option to deploy the full 12-site Safeguard system I mentioned earlier.

The PRC air defense system is quite limited compared with that of the Soviet Union. By mid-1972, they will have more than 3,000 home defense interceptors but, except for a relatively small number of MIG–21's, all of these aircraft are MIG–17's and MIG–19's. The PRC, however, is now producing interceptor aircraft at a fairly sizable rate.

The PRC will also have several hundred SAM launchers by mid–1972, and this number will probably continue to increase gradually over the next few years, since the system is still in production.

Summary of the Strategic Balance

In summary, I believe it is clear from the foregoing discussion that the strategic power of the Soviet Union and the Peoples Republic of China in relation to that of the United States has distinctly increased during the past five years; and, short of a favorable outcome in SALT or a major expansion in U.S. forces, is likely to increase even further during the next 5 years.

With regard to the Soviet Union, there can be no question that the strategic nuclear balance, at least in quantitative terms, is turning against us. As you know, the Soviets have already overtaken us in strategic offensive megatons; this year, they will overtake us in strategic offensive delivery vehicles. If they now move vigorously into MIRV's, as our intelligence specialists anticipate, they could narrow the gap in strategic offensive warheads/bombs, as well.

Although our quantitative lead over the Soviet Union is now tenuous, I believe we still retain some important qualitative advantages. We are still ahead in MIRV technology and missile guidance. Our bomber forces are not only larger but also more capable, and our aircraft technology generally is still superior.

However, the Soviets are placing top priority on military R. & D. During the 1960's, for example, they doubled their R. & D. expenditures. Moreover, they are making extensive investments in both capital and manpower. Although they have overtaken the U.S. in numbers of R. & D. scientists and are graduating more than five times as many engineers as we are, Soviet officials are complaining about the shortage of engineers. In contrast, U.S. educators are concerned about the oversupply. It is clear that Soviet improvements in hardware and technology will continue well into the 1970's, even if they abruptly curtail their R. & D. investments in capital and manpower.

Given this scope and momentum in the Soviet R. & D. program, many of our technical advantages could well disappear during the

next 5 years. Consequently, we cannot rule out the possibility that, without vigorous action on our part, the Soviet Union could achieve a position of overall strategic superiority within this decade. That is why it is so vitally important that we sustain the momentum of our R. & D. programs and hedge against the most serious threats which the Soviets might be able to pose to our strategic deterrent forces during that time. In this connection, I want to state once again the firm conviction of the Joint Chiefs of Staff that an appropriate mix of mutually supporting strategic forces is still essential to the maintenance of our deterrent.

I do not believe the Soviets are capable of destroying in a first strike so large a portion of our strategic offensive forces as to eliminate our ability to inflict on them significant damage in retaliation. They could, however, achieve a capability to inflict upon us and our allies considerably more damage in a first strike than we could inflict upon them in retaliation, and this is a danger we must guard against.

There is yet another reason why we must now pay closer attention to the strategic balance between the United States and the Soviet Union. The mere appearance of Soviet strategic superiority could have a debilitating effect on our foreign policy and our negotiating posture. It could erode the confidence of our friends and allies in the deterrent power of our strategic forces, upon which the entire structure of free world defenses essentially rests.

As I noted last year, Soviet officials have already made claims of superiority, and we, on our part, are making a special effort to ensure that our allies have a correct understanding of all factors involved in the strategic balance. But the lesson here should not be lost upon us—we will pay a very high price in the effectiveness of our diplomacy if we permit the Soviet Union to achieve a clearly evident strategic superiority, even if that superiority would have no practical effect on the outcome of an all-out nuclear exchange.

Finally, the emergence of the Peoples Republic of China as a significant nuclear power has added a new and complex factor to the strategic equation, both for the United States and the Soviet Union. China probably already has a capability to deliver nuclear weapons on Soviet targets in Siberia, and on U.S. forces and U.S. allies in Asia and the Western Pacific. By the mid-1970's, China's nuclear reach could extend to all of the Soviet Union, and by the end of the decade to the Continental United States as well.

Regardless of how the relations among these three nations may develop in the future, U.S. strategic forces must always be sufficient to cope with both the Soviet Union and China simultaneously. Even if we were involved in a nuclear war with only one of these nations, we would still need sufficient strategic forces to deter, simultaneously, a nuclear attack from the other.

As of this moment, I believe our strategic forces are sufficient to deter a nuclear attack on the United States and its allies. However, in view of the rapid buildup of nuclear forces elsewhere, which I have described to you in detail, it is clear that we must now press forward expeditiously with the strategic force initiatives discussed by Secretary Laird in his fiscal year 1973 Defense Report. Barring an effective agreement on the limitation of strategic arms or an arrestment

on the part of the Soviets of their strategic arms buildup, failure to take such action will force us into a position of strategic inferiority in the years ahead.

JAPANESE CONCERN AND CAPABILITY

Senator YOUNG. Mr. Chairman, aren't the Japanese going to become more and more concerned as China develops into a nuclear power? They will either want to provide their own nuclear weapons or have some of ours, won't they? The Japanese are about the most concerned of any nation over our President's visit to China.

Admiral MOORER. They are the one nation in the western Pacific that has the heavy industry and technical capability to develop all of these systems if they choose to do so. There is no question about that.

LAND-BASED AND SUBMARINE MISSILES

Chairman ELLENDER. Do you think that if we carry out the program that you are now suggesting, it will prompt Russia to do the same thing?

Admiral MOORER. No, sir. I don't. They are already doing a lot more than we are doing. We are not at this moment building any new land-based missiles or any new sea-based missiles.

Chairman ELLENDER. The reason is you want to develop submarines.

Admiral MOORER. That is not the reason we are not doing it. We do not have any program. It will be 1978 before we will add the first additional missile to the [deleted] ICBM's and 656 SLBM's, we will have at that time. In the meantime, if they continue at the rate they are going, they will have over [deleted] ICBM's and SLBM's. That is all I am saying. That concerns me very much. I don't think we can just remain in a static posture while they continue this rapid buildup because if they develop an image of superiority in the world today, it will give them a diplomatic advantage of significance as well as a military advantage. In other words, the United States would have no credibility with their allies and, for that matter, they would have no credibility with those who choose not to be our allies.

[Discussion off the record.]

Chairman ELLENDER. Please proceed.

GENERAL PURPOSE FORCES

Admiral MOORER. I have already noted the key role played by our strategic forces in our overall defense posture. General purpose forces, including theater nuclear forces, are also an essential part of that posture. They constitute the principal means of deterring attacks at levels less than strategic nuclear warfare.

Each of the service chiefs will discuss with you in more detail the areas of particular concern to his service. My discussion at this time will be limited to an overall comparison of our general purpose forces with those of the Soviet Union and the Peoples Republic of China, using for this purpose a few key indicators. Because of its vital importance to the security of the United States, I will also discuss the existing military balance between NATO and the Warsaw Pact in the central region of Europe.

Theater Nuclear Forces

The theater nuclear capable forces of the Soviet Union include large numbers of medium and intermediate range ballistic missile launchers, tactical surface-to-surface missile launchers in ground units, medium bombers in long range aviation and naval air forces, and light bombers and fighters in the tactical air forces. Additionally, Soviet naval forces, both surface and subsurface, also carry nuclear capable weapon systems.

Chairman Ellender. Most of those are in Europe, aren't they?

Admiral Moorer. I am talking about Russia. They are not all in Europe. Some are along the Chinese border.

Chairamn Ellender. These are not long-range weapons?

Admiral Moorer. No, sir. These are the nuclear weapons. None of these will reach the United States. I am talking about what they have over in Europe and along the Chinese border.

NATO Nuclear Capability

Chairman Ellender. Do you know what our allies have?

Admiral Moorer. Our allies have no nuclear capability except——

Chairman Ellender. I don't suppose they will secure it unless we furnish it to them, will they?

Admiral Moorer. They have signed the Nonproliferation Treaty and the NATO Allies, with the exception of the United Kingdom, do not have a nuclear capability except at the sufferance of the United States. We have aircraft in NATO which are manned by Allied powers and can deliver U.S. nuclear weapons.

Senator Young. That does not include France?

Admiral Moorer. That does not include France; no, sir. The French have their own nuclear capability.

Senator Young. At short range or intermediate range could they reach Russia?

Admiral Moorer. That depends on where they launch from, but most of their action would be against East Germany and the satellites in that area.

Senator Young. If NATO were to go to war with Russia, France would be drawn into it.

Admiral Moorer. [Deleted.]

It is difficult to draw any precise conclusions as to the relative balance in theater nuclear weapons between the Soviet Union and the United States because of the inherent uncertainties in our estimates of Soviet nuclear weapon inventories. In general, however, I would judge that the United States is at least the equal of the Soviet Union, and perhaps the superior.

The recent growth of the PRC theater nuclear capabilities has been remarkable, however, their delivery systems are still limited to light and medium bombers and possibly medium-range ballistic missiles. Even though the PRC is still far behind both the U.S. and the Soviet Union, the weight of the evidence clearly indicates that, in terms of theater nuclear warfare, it is already a nuclear power to be reckoned with.

Naval Forces

Turning now to the general purpose forces as a whole, I noted at the beginning of this statement that the Soviets, and more recently the PRC, are concentrating a considerable effort on the expansion and modernization of their naval forces. Both nations have greatly expanded their naval shipbuilding capacities, including the construction of entirely new, modern facilities. The major emphasis in the Soviet program appears to be on modernization, while the emphasis in the PRC program is on expansion, as well as modernization.

Senator Young. What is the difference between the Russian cruiser and a frigate?

Admiral Moorer. The cruiser is larger and has both surface-to-surface and surface-to-air missiles. It is bigger with more weapons. It has the same weapons, but more of them and a larger variety.

Russian 10-Year Increase of Combat Ships

Chairman Ellender. Admiral, do you know percentagewise the extent to which the Soviets have increased their combat ships inventory in the last 10 years?

Admiral Moorer. As I show here, the increase in the total numbers of surface combat ships has not been significant. What is significant is the very aggressive modernization program wherein they are trading off old ships which have no surface or surface-to-air missile capability with now ones that do have that capability. So what they are doing is going ahead vigorously with a modernization program. But the total number of surface combat ships that you see by this curve has not increased radically.

Chairman Ellender. We got the information that they have increased about 7 percent in the last 10 years.

Admiral Moorer. Well, sir, I think in the last 10 years that is about right, because they were down here to 185.

Shown on chart 10 is a comparison of the numbers of United States, Soviet, and PRC major operational combat surface ships.

The Soviets, in the past 5 years (mid-1966 to mid-1971), have increased the number of major combat surface ships from 185 to 215. During the same period, however, they phased out 33 old ships and added 63 new ships to their fleet. The new ships included two helicopter carriers, seven missile cruisers, 18 missile destroyers, and 36 escorts.

The rate of modernization in the Soviet surface fleet is expected to accelerate during the next 5 years. During this period, we believe the Soviets will add many new ships to their fleet, including missile armed cruisers, destroyers, and helicopter ASW ships. Older ships in the fleet will probably continue to be phased out. By mid-1977,

almost half of the Soviet combat surface ships are expected to be armed with missiles—some with surface-to-air or surface-to-surface missiles only, and some (particularly the cruisers) with both.

As shown on chart 10, the PRC has only lately begun to expand its fleet of major combat surface ships. Prior to 1966, this fleet consisted of eight Soviet-built ships—four DD's and four DE's. Beginning in 1966, a new class of Chinese-built DE's was introduced, and there are now a number of such ships in the fleet. In 1971, the first of a new class of Chinese-built DDGS's (armed with surface-to-surface missiles) was introduced, and we believe more of these ships will be built over the next several years.

As I noted last year, the size of the U.S. Navy is being reduced in order to provide for the modernization of the fleet. In other words, a choice has been made in favor of a smaller but more modern fleet. Accordingly, the number of U.S. major combat surface ships, which increased to a Vietnam peak of 324 in mid-1968, will drop to 243 by mid-1972, and the number will continue to decline through the mid-1970's as World War II ships are retired from the active fleet at a far more rapid rate than new ships are delivered.

By mid-1977, the long downward trend should level off as the number of new ships entering the active fleet exceeds the number being retired. From mid-1966 through mid-1971, we added 34 new major combat surface ships to the fleet—including one attack carrier, 26 ASW escorts, and seven fleet air defense escorts. From mid-1971 through mid-1977, we expect to add 42 new ships—including two attack carriers, 35 ASW escorts, and five fleet air defense escorts.

While some of our carriers and all of our air defense escorts carry surface-to-air missiles, none of our ships are armed with surface-to-surface missiles. (Some SAMs have a secondary surface-to-surface capability.) As an interim measure, beginning this year, some of our ships will be equipped with a surface-to-surface version of the standard SAM. For the long term, a new surface-to-surface missile, the Harpoon, is being developed. This missile should be available for deployment in the mid-1970's.

In our effort to exploit the full potential of our total forces, the Air Force, working together with the Navy, has recently undertaken a program to improve its aerial mining capability and its ability to interdict enemy surface ships.

Shown on chart 11 are the United States, Soviet, and Peoples Republic of China attack submarine forces, projected through mid-1972.

Although the total number of Soviet attack submarines is expected to continue to decline over the next several years, the number of new, modern nuclear submarines is expected to increase. Two new classes of nuclear-powered submarines were introduced into the fleet in 1968—the C-class and the V-class.

The C-class is primarily an antiship submarine. It carries antiship missiles and can utilize its own sensors for target detection and fire control. By mid-1971, several C-class submarines were operational, and we believe that construction of this class is continuing.

The V-class, on the other hand, is primarily an ASW submarine. It is believed to be one of the fastest submarines in the world. Several are now operational, and we believe that construction of this class is also continuing.

In mid-1971, the Soviets had a total of more than 250 attack submarines, of which more than 50 were nuclear powered. It is expected that the total number of Soviet attack submarines will decline during the next 5 years, as new, more sophisticated nuclear-powered classes are introduced into the fleet and the older and shorter range diesel-powered submarines are decommissioned.

Prior to 1965, the Peoples Republic of China had 28 Soviet-built diesel-powered submarines, most of which were the 1,355 ton submerged displacement W-class. Beginning in 1965, a Chinese-built version of the Soviet R-class diesel-powered submarine (with a submerged displacement of 1,800 tons) entered the fleet. Construction of this version is expected to continue.

As new classes of submarines join the PRC fleet, we believe some of the older Soviet-built submarines will be phased out. On the whole, the PRC attack submarines are considered distinctly inferior to United States and Soviet long-range nuclear-powered attack submarines.

The number of U.S. attack submarines will continue to decline through mid-1974. We plan to start bringing the new, high-speed 688-class submarines into the fleet in 1975, gradually replacing the remaining diesel-powered submarines.

Although none of our submarines are currently configured to carry cruise missiles, we are developing one for use by submarines. This missile, however, will not be available for deployment until the mid-1970's.

Even though the PRC "deep water" fleet may increase dramatically over the next several years, it will still be Asia-oriented and have only a relatively limited capability in global terms. The continuing modernization of the Soviet deep water fleet, however, is quite another matter. That fleet is rapidly acquiring a capability to mount a major challenge to our control of the seas.

In evaluating the relative strength of the United States and Soviet general purpose Navy forces, we must bear in mind their differing primary objectives. Because of our great dependence on overseas sources of raw materials and because of our strong ties to our overseas allies, we must insure our access to the seas in both peace and war. Consequently, U.S. Navy general purpose forces have been designed primarily to control the sea lines of communication and to project our seapower across the oceans. The Soviets, in contrast, are less dependent on overseas sources of supply and are less involved with overseas allies. Their long-term objective, apparently, is to weaken our ties with our overseas allies and prevent us from coming to their assistance in time of war. Accordingly, the Soviet Navy general purpose forces have been designed primarily to disrupt our sea lines of communication and obstruct the projection of our seapower across the oceans.

U.S. Navy general purpose forces are built around: (1) the attack carriers and the Navy-Marine Corps amphibious team, which together provide the principal means for destroying opposing maritime capabilities and for projecting our seapower across the oceans; and (2) the sea control forces, which provide the principal means for protecting our sea lines of communication from attack. The Soviet Navy general purpose forces, in contrast, are built around their attack submarines (including cruise missile submarines), their surface ships armed with antiship missiles, and their land-based naval bombers armed with air-to-surface missiles.

The Soviets still cannot match our capabilities to project seapower and control the sea lines of communication. However, they already have a formidable capacity, particularly in their large and varied antiship missile forces, to attack our seapower projection forces and to sever our sea lines of communication.

The problems we face with the continuing growth in Soviet naval capabilities relative to our own is a matter of increasing concern to the Joint Chiefs of Staff. The Soviet Navy has already acquired a global reach. Their ships are now operating on a sustained basis in the Atlantic, Pacific, and Indian Oceans, the Mediterranean, and increasingly in the Caribbean. Unless we accelerate the modernization of our fleet, the Soviets will increasingly challenge our control of the seas in those maritime regions essential to the success of our forward defense strategy, as well as in ocean areas closer to our shores.

Tactical Air Forces

Shown on chart 12 are the United States, Soviet, and PRC tactical aircraft inventories, including fighter, attack, light bomber, and reconnaissance aircraft.

The U.S. figures include all such aircraft in the Air Force, Navy, and Marine Corps (both Active and Reserve), but exclude those used for training and those assigned to and reported under continental air defense.

The Soviet figures similarly exclude tactical-type aircraft used for training, and fighter aircraft assigned to the PVO Strany home defense forces (more than 3,000 in 1972). Some of these aircraft could be diverted to the tactical air superiority role, if needed. Also excluded from the Soviet figures are several hundred older aircraft in storage which could be reactivated.

The PRC figures include all fighters and light bombers in the active inventory of the CCAF and CCNAF, but exclude those fighter aircraft estimated to be assigned to home defense (over 3,000 in 1972). Some of the home defense aircraft could, of course, be diverted to the tactical role. No reserve figures are available for the PRC.

The upturn of the U.S. inventory during the 1966–69 period reflects the Vietnam buildup, but the long-term downward trend has since been resumed. From a peak of about 5,800 tactical aircraft in 1969, the U.S. inventory is programed to decline to about 5,000 in 1973, at which point it is expected to level out. This downward trend reflects the introduction of newer and more capable aircraft into the forces.

The Soviet inventory, which rose from about 3,300 aircraft in 1963 to almost 4,300 aircraft in 1971–72, is projected to decline somewhat over the next few years. This decline reflects the introduction of newer and more capable aircraft into the forces on a less than one-for-one basis. Most of the old fighters (MIG 17's and 19's) and light bombers (IL–28's and YAK–28's) are expected to be phased out of the force over the next several years. A new swing-wing version of the Flogger is currently entering the inventory, and a tactical version of the Foxbat is expected to enter the inventory of 1973.

The Peoples Republic of China tactical aircraft inventory has climbed from about 500 in 1965 to over 600 in 1971. Advanced jet fighter aircraft are now being produced in the People's Republic of China and will continue to contribute to the modernization of the

tactical air forces in the years ahead. Although this buildup of tactical airpower is impressive in terms of China's current industrial capacity, the Peoples Republic of China's tactical air forces over the next several years will still be far behind those of the United States and the Soviet Union, both quantitatively and qualitatively.

In assessing the relative capabilities of the United States and Soviet tactical air forces, it should be borne in mind that they reflect different deployment and operational concepts and, thus, different aircraft design philosophies. A basic U.S. concept is to meet the enemy threat as far forward as possible. Therefore, the United States must have the capability to deploy its tactical aircraft rapidly over long ranges. Once in the forward area, this range capability can be converted into increased ordnance payload. Consequently, most U.S. tactical aircraft have good range/payload characteristics in the air-to-ground role.

The basic Soviet tactical air concept, in contrast, is to engage potential enemies on the periphery of their large continental land mass. Operating on internal lines of communication, their tactical aircraft either have relatively short distances to fly to likely combat areas, or, if a repositioning is required, they can use land bases available en route. For this and other reasons, the Soviets emphasize altitude and maneuver capabilities in their tactical aircraft designs, rather than range/payload.

As a result, U.S. tactical air forces have an advantage in the ground attack role, while the Soviet tactical air forces currently have some advantage in the air superiority role. That is why we feel it is so important to press forward with the Navy F–14 and the Air Force F–15 development-production programs, as well as the proposed lightweight fighter prototype development program. The F–14 and F–15 aircraft are expected to be distinctly superior to any tactical aircraft the Soviets (or Peoples Republic of China) are likely to deploy in the 1970's. The lightweight fighter would be designed to provide us with a much more specialized but, hopefully, a less expensive air superiority capability.

Ground Combat Forces

Shown on chart 13 are the active duty strengths of the United States, Soviet, and Peoples Republic of China ground combat forces. In order to achieve a greater degree of comparability, the Soviet ground combat force figures have been adjusted by excluding personnel assigned to strategic offensive and defensive missions, and by including personnel in the naval infantry, coastal defense, and security forces. The U.S. figures have been adjusted by including all Marine Corps personnel, except for those assigned to tactical air and air defense units, and excluding Army personnel in strategic (continental) air defense units. The Peoples Republic of China figure, on the other hand, includes all active duty ground combat force personnel.

In mid-1972, on this adjusted basis, the Soviets are expected to have about 2.2 million active duty personnel in their general purpose ground combat forces, the Peoples Republic of China nearly 2.6 million, and the United States a little over 1 million. Both the Soviet and the Peoples Republic of China ground combat forces, in terms of military personnel on active duty, are expected to be considerably large than our own in the 1970's.

It is difficult to make a direct comparison of Soviet, United States, and Peoples Republic of China inventories of major ground combat force weapons and equipment, because we have no certain way of knowing what the total inventories actually are. Additionally, there are numerous problems of definition and classification involved in any comparison of the Soviet, United States, and Peoples Republic of China forces. For example, there is a question as to which combat vehicles should be included in the tank category, and which in the armored personnel carrier and fighting vehicles category. Regardless of how these vehicles are categorized, however, it is clear that the Soviet inventories of tanks and fighting vehicles are considerably greater than ours, while the Peoples Republic of China inventories are considerably less.

Tanks are the predominant feature of Soviet ground force equipment, and they have far more of these combat vehicles than we do. Although most Soviet tanks are older models, a substantial portion are T–62's. This tank is comparable to our best tank, the M–60.

We are now pursuing a program which will provide our M–60 series tanks with improvements in fire control, mobility, night vision, and reliability. We are also fielding, in a limited quantity, a missile firing tank, the M–60A2, which will complement our M–60 series tank fleet. The Soviets are also continuing to modernize their tank forces. A new follow-on medium tank is currently under development. Even so, production of the T–62 is expected to continue, at least over the next few years.

The Peoples Republic of China Army is essentially an infantry force. Their units lack adequate organic transportation, and their inventories of fighting vehicles are still quite limited. Production of armored vehicles, artillery pieces, and all types of light infantry weapons (mostly Soviet design) has been increased significantly since 1965. It is expected that this expansion of armament production will continue in the years ahead.

Both the Soviets and the Peoples Republic of China possess a considerably greater number of artillery pieces than the United States, and the majority of their cannon artillery pieces have a greater range capability than ours. However, through our use of self-propelled artillery and helicopters, we have the advantage in mobility. Moreover, the Lance, our newest surface-to-surface missile system, will begin replacing the aging Honest John and Sergeant systems this fiscal year. Lance will provide us with a quicker reacting and more accurate, mobile, and reliable missile firepower system.

The United States, U.S.S.R., and Peoples Republic of China are considerably closer together with regard to numbers of medium and heavy antitank weapons, but the Peoples Republic of China inventory, as in the case of artillery, is composed mostly of World War II-type weapons. U.S. Army units are now being equipped with the Tow wire-guided antitank missile, which has proven to be very accurate and reliable. Moreover, an excellent new antitank assault weapon for the infantry platoon, called Dragon, is being procured in quantity in fiscal year 1973.

With regard to helicopters, we have far more dedicated to the ground combat role than the Soviets and Peoples Republic of China combined.

The Soviets now have a total of 160 divisions in various states of peacetime readiness. They range from fully manned and equipped units in a high state of readiness, to skeletal or cadre divisions with a limited amount of equipment.

It is also important to note that Soviet divisions have considerably fewer personnel than ours. For example, a Soviet tank division at full strength has about 9,000 men, over 300 tanks, and about 100 armored personnel carriers; whereas an average U.S. armored division has about 17,000–18,000 men, 324 tanks, and 358 armored personnel carriers. Moreover, a U.S. armored division has more than three times as much fuel-carrying capacity as the Soviet tank division.

In addition, U.S. Army divisions are deployed with numerous nondivisional combat support type units; a U.S. "division force equivalent" numbers about 48,000 men. This total includes reconnaissance, artillery, aviation, and service support units, which add to the division's firepower and sustainability. Although the term "division force equivalent" is not applied to Marine Corps divisions, a similar principle of reinforcement for combat is employed.

The Soviets do not maintain such extensive nondivisional support in their active ground combat forces; they tend to emphasize striking power more than staying power and logistic support, when compared to U.S. forces in peacetime. Much of the service support required for sustained operations is apparently planned for mobilization from the Soviet economy. The militarized units of automobile trusts, for example, are apparently called up intact. Railroad units, sections of hospitals, and civilian maintenance elements are also known to be mobilized as complete entities. Thus, economically, the Soviets can maintain a large ground force establishment which emphasizes striking power without having to tie up or duplicate thousands of trucks, specialized equipment, and other items which are needed in the highly centralized Soviet economy.

Notwithstanding the improvement in the equipment readiness of U.S. divisions during the past year, the overall readiness of these forces has temporarily declined. There are several reasons for this decline, the most important of which is the severe personnel turbulence caused by heavier-than-expected cuts in the fiscal year 1972 personnel strengths. Every possible effort is now being made to improve both our personnel and equipment readiness, and we hope to be able to present a much better picture next year.

NATO-Warsaw Pact Balance in the Central Region

As I noted at the beginning of this discussion of the general purpose forces, the fate of Western Europe is of vital importance to our own security. Should the Soviet Union, or any other power antagonistic to our national interests, gain dominion over Western Europe, the very existence of this Nation would be threatened. NATO Europe, with its industrial, economic, technological, and military strength and potential, is second only to the United States in strategic importance in the free world. Therefore, the deterrence of attack on Western Europe, at any level of conflict, has a very high priority in our military planning. Should deterrence fail, NATO forces must be able to halt the aggression firmly and swiftly. Their capability to do this is

essential to the credibility of our deterrent and could well be the decisive factor in whether we have peace or war.

We are fortunate that our partners in NATO are willing allies in this endeavor. They are assuming a greater share of the defense costs this year than ever before in the history of NATO. Nevertheless, a careful analysis of the alinement of forces in Europe can lead to only one conclusion, namely, that the U.S. contribution of forward deployed general purpose forces is still essential to the maintenance of a viable military balance between NATO and the Warsaw Pact.

The leader, and by far the most powerful member of the Warsaw Pact, is the Soviet Union, and, the most critical front in Western Europe is the central region of NATO, stretching from the borders of Switzerland and Austria in the south to the Baltic Sea in the north. Before examining the military balance in the central region, therefore, I believe it would be useful to note the current deployment of all Soviet divisions and tactical air units.

Of a total of 160 Soviet divisions and about 4,300 tactical aircraft, approximately one-quarter is oriented toward China, more than one-half is oriented toward Western Europe, and the balance appears to be oriented in neither direction. Of the Soviet forces oriented to Western Europe, most are oriented to the central region, and only a smaller part to the northern and southern regions. Most of the East European forces are also oriented to the central region, with the balance oriented to the southern region.

Thus, in our analysis of the Soviet forces positioned opposite the central region of NATO, we include only about one-third of the total number of Soviet divisions, and less than one-half of their tactical aircraft. In addition, we include well over half of the East European divisions and aircraft.

I will now attempt to summarize, in a highly simplified form, the military balance in the central region of NATO as it stands today. You are aware, I am sure, of the difficulties involved in drawing up such a balance. There are a great many uncertainties, not only with respect to the qualitative characteristics of the two forces, but also with regard to the numbers and types of forces which should be included.

For example, should the divisions in the most westerly military districts of the Soviet Union be included in the Warsaw Pact "immediately available" combat-ready forces? Should all of the Soviet airborne divisions be included in the Warsaw Pact forces? Should the French units be included on the NATO side, even though they are not part of the integrated military organization? Should the United States and United Kingdom tactical aircraft in the United Kingdom be included in the NATO "immediately available" forces? Should the East European air defense aircraft be included in the Warsaw Pact tactical air forces?

These and many other similar questions have no absolute answers; for purpose of a comparison such as this, they must simply be resolved on the basis of an informed judgment. Accordingly, there is ample room for differences of opinion among equally competent experts, and you should not be surprised if other interested persons choose to array these forces differently.

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With these caveats in mind, I would now like to give you my assessment of the balance between the NATO and Warsaw Pact combat ready, "immediately available" forces in the central region of Europe as of January 1972. For this purpose, the French divisions are considered separately since they are not a part of the integrated NATO force. On the NATO side, all United States and allied divisions stationed in the central region of Western Europe are considered "immediately available." On the Warsaw Pact side, only the combat-ready Soviet and Eastern European divisions in Poland, East Germany, and Czechoslovakia are considered "immediately available." The divisions in the most western military districts in the Soviet Union are not included.

On this basis, the balance in terms of divisions greatly favors the Warsaw Pact. However, the number of divisions is not always a true measure of the overall combat capabilities of opposing ground forces. The number of men in combatant units should also be considered. These units include, in addition to the divisions themselves, nondivisional combat and combat support elements such as corps artillery, army aviation companies, combat engineers, and so forth. In this measure of combat capability, NATO and the Warsaw Pact are much more evenly matched.

In terms of major ground forces weapons, the Warsaw Pact has a very distinct advantage, with more than double the number of tanks and artillery pieces. The two sides are about evenly matched in numbers of antitank weapons, but NATO forces will gain an advantage in this category as United States and allied forces in Europe are equipped with TOW and other antitank missiles.

With regard to tactical aircraft, I consider all of the combat aircraft of the East German, Polish, and Czechoslovakian Air Forces, plus all of the Soviet "frontal aviation" aircraft in those three countries, as "immediately available" to the Warsaw Pact. On the NATO side, I consider as "immediately available" all of the combat aircraft in the Belgian, Netherlands, and West German Air Forces, plus the United States, United Kingdom, and Canadian tactical aircraft in those countries. I excluded from the NATO total all of the RAF and USAF tactical and air defense aircraft stationed in the United Kingdom since these aircraft are not physically present in the central region. In this measure of the military balance, the Warsaw Pact again has a distinct advantage in the number of tactical aircraft immediately available in the area. Even including the United States and United Kingdom aircraft in the United Kingdom, the Warsaw Pact still has an advantage.

Because of the proximity of the numerous additional combatant units located in the Western military districts of the Soviet Union, and because the entire Warsaw Pact division structure can be fully manned very quickly, the Warsaw Pact forces would have an even greater advantage over NATO after a short period of mobilization. Accordingly, any further unilateral reductions in the NATO forces at this time would clearly be extremely risky.

I will not go into the NATO-Warsaw Pact balances in the northern and southern regions, but I would like to point out that the capabilities of the Warsaw Pact forces facing our NATO partners along both the northern flank and the Mediterranean littoral have significantly increased in recent years.

CONCLUSION

Mr. Chairman, I believe the facts and figures presented here today fully substantiate the concerns I expressed at the beginning of this statement. The military programs recommended in President Nixon's fiscal year 1973 budget represent the very minimum effort this Nation should be willing to support at this juncture. We must maintain our strategic deterrent, not only with respect to the Soviet Union, but also with respect to the Peoples Republic of China. In addition, we must maintain that minimum level of general purpose forces (Active and Reserve), which, together with the forces of our allies, is sufficient in size, readiness, and mobility to fulfill our treaty commitments and protect our vital interests when crises develop.

On behalf of the Joint Chiefs of Staff, I strongly urge the members of this committee to support in full the Defense program and budget proposed by the President for fiscal year 1973.

Thank you, Mr. Chairman.

CHARTS RELATED TO ADMIRAL MOORER'S STATEMENT

Chairman ELLENDER. The charts appended to your statement will appear in the record at this point.

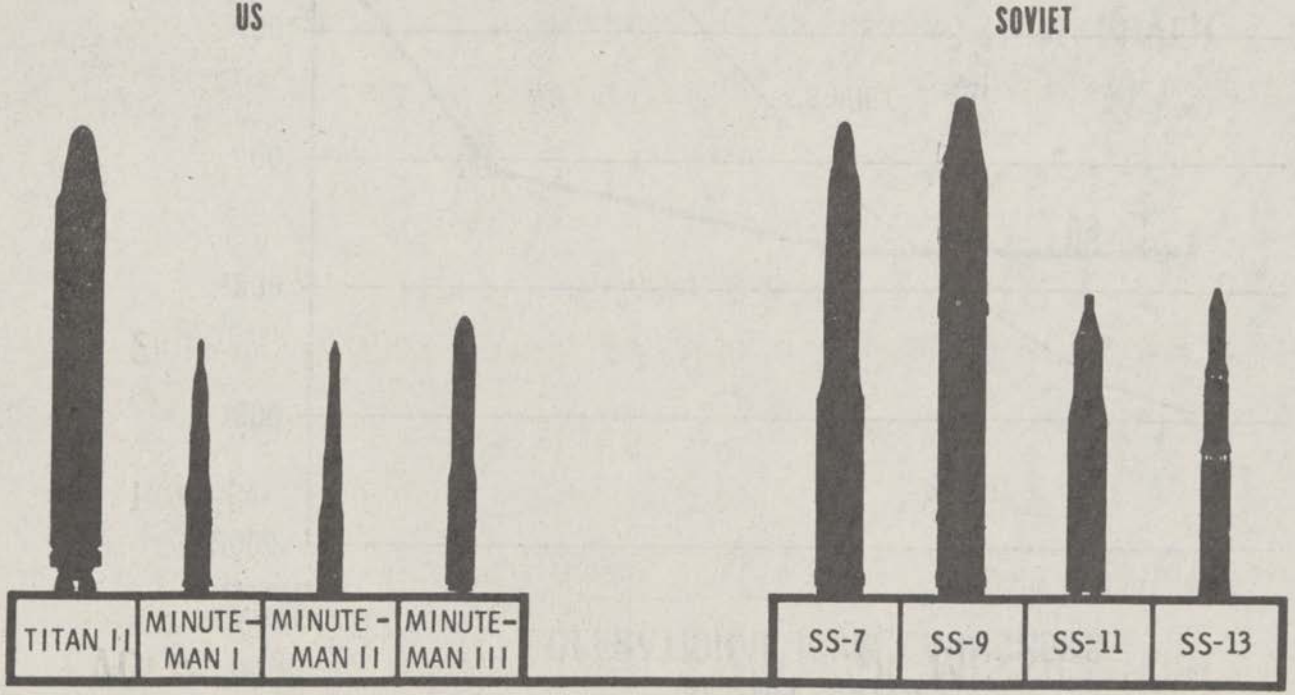
(The charts follow:)

EVOLUTION OF US & SOVIET STRATEGIC MISSILE FORCES

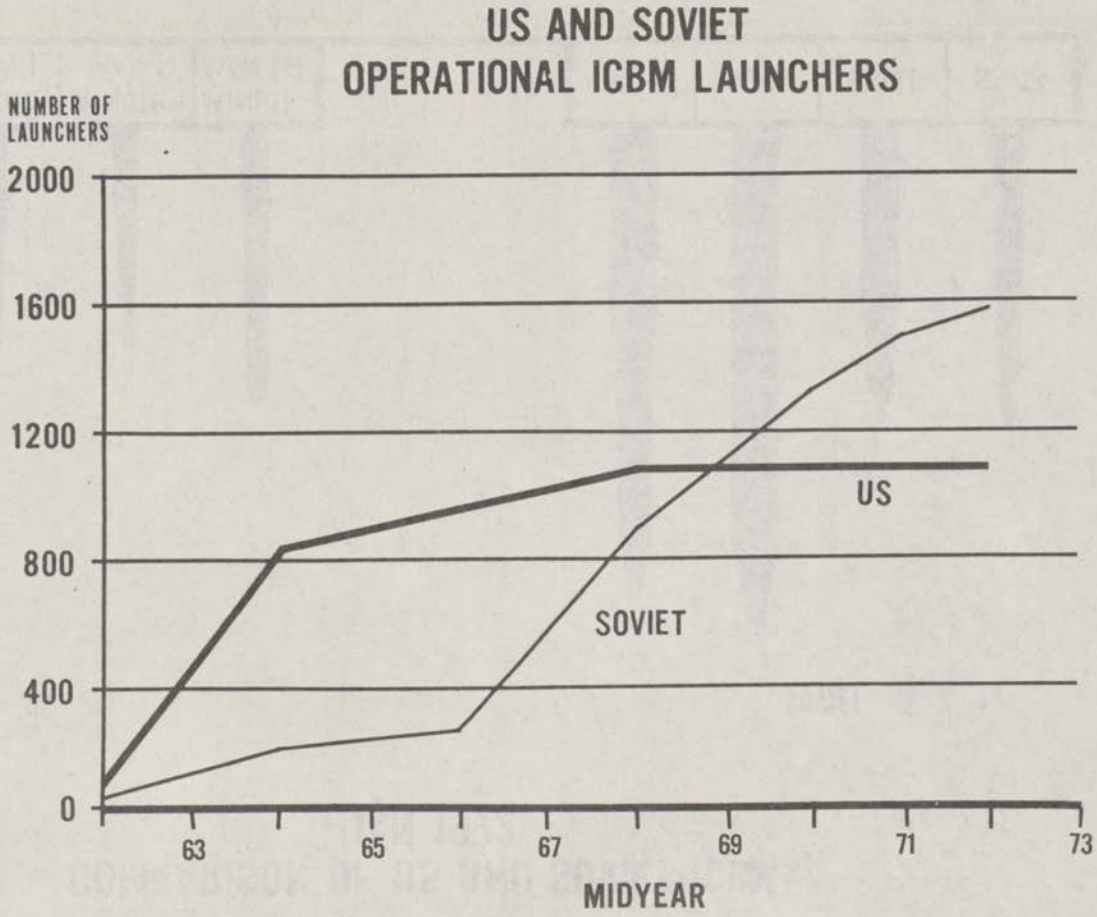
	UNITED STATES	SOVIET UNION
1st GENERATION	ATLAS, TITAN, REGULUS	SS-6, 7 & 8 SS-N-3, 4 & 5
2nd GENERATION	MINUTEMAN I & II POLARIS A-1, A-2, A-3	SS-9 MOD 1, 2 & 3 SS-11 SS-13 SS-N-6
3rd GENERATION	MINUTEMAN III POSEIDON	SS-9 MOD 4 SS-11 IMPROVED SS-13 IMPROVED SS-NX-8 NEW ICBM SILOS

562

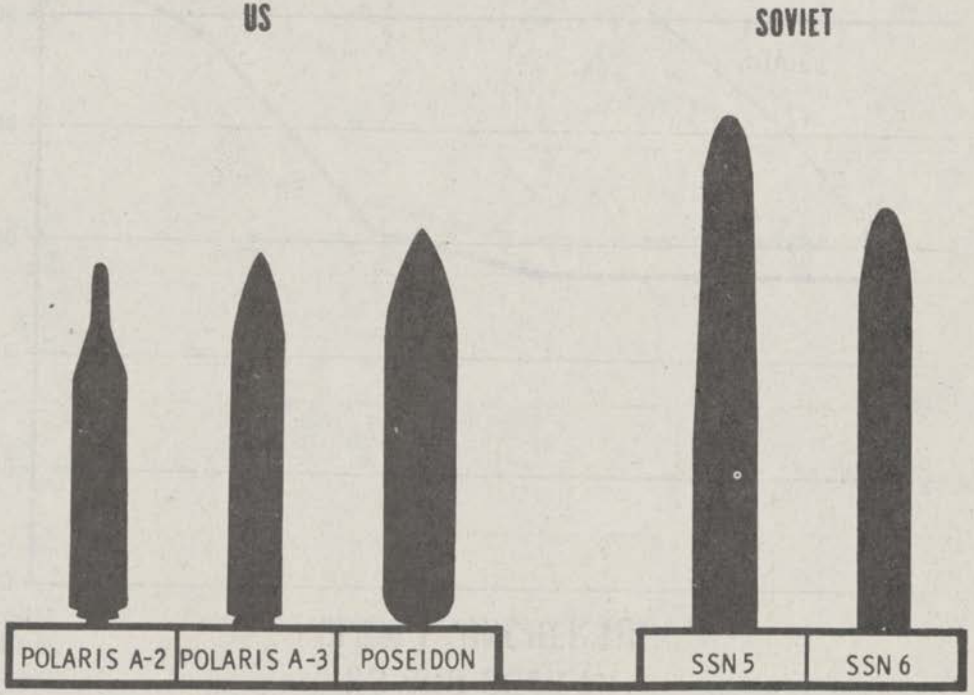
COMPARISON OF US AND SOVIET ICBMs
(JAN 1972)

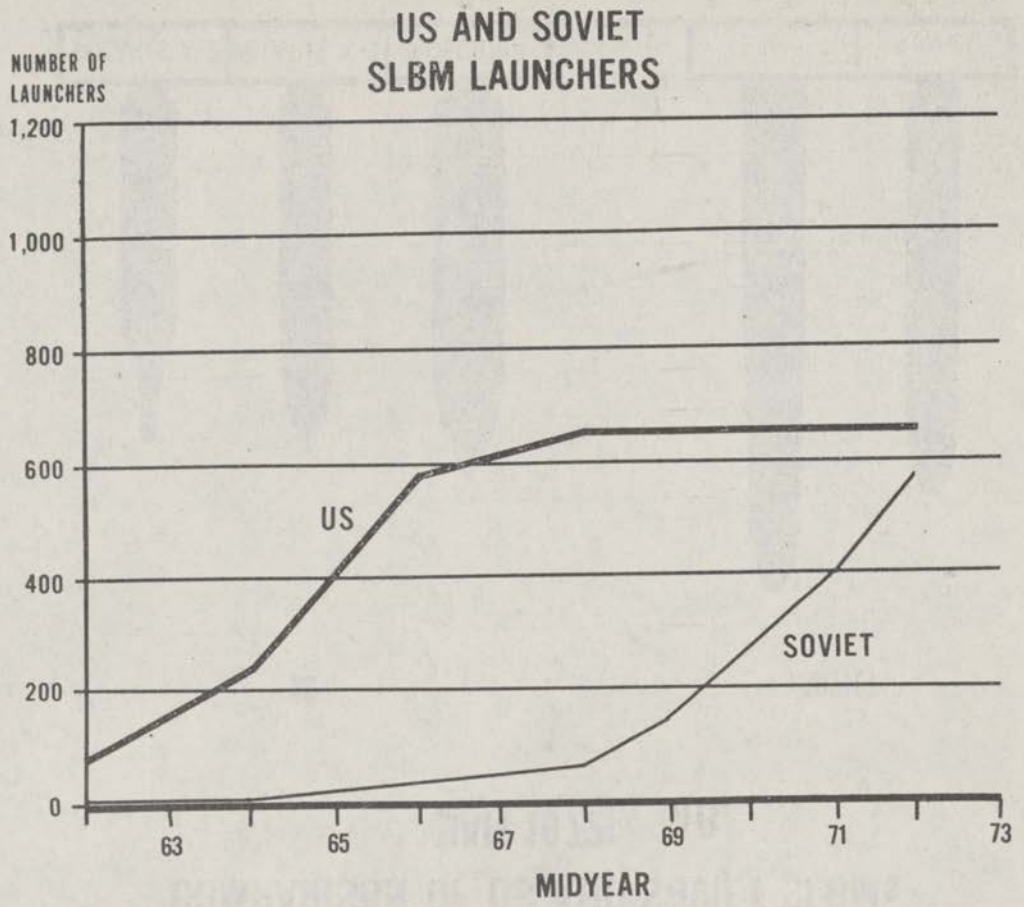


563

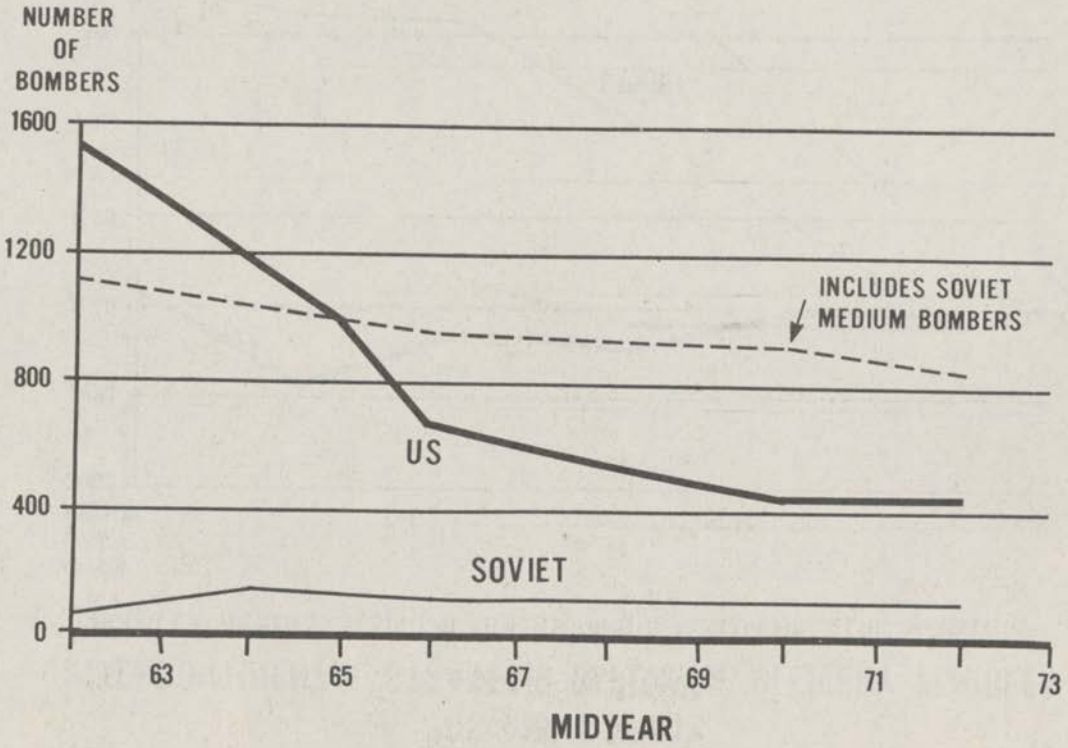

US AND SOVIET
OPERATIONAL ICBM LAUNCHERS
NUMBER OF LAUNCHERS
2000
1600
1200
800
400
0
US
SOVIET
63
65
67
69
71
73
MIDYEAR

COMPARISON OF US AND SOVIET SLBMs
(JAN 1972)

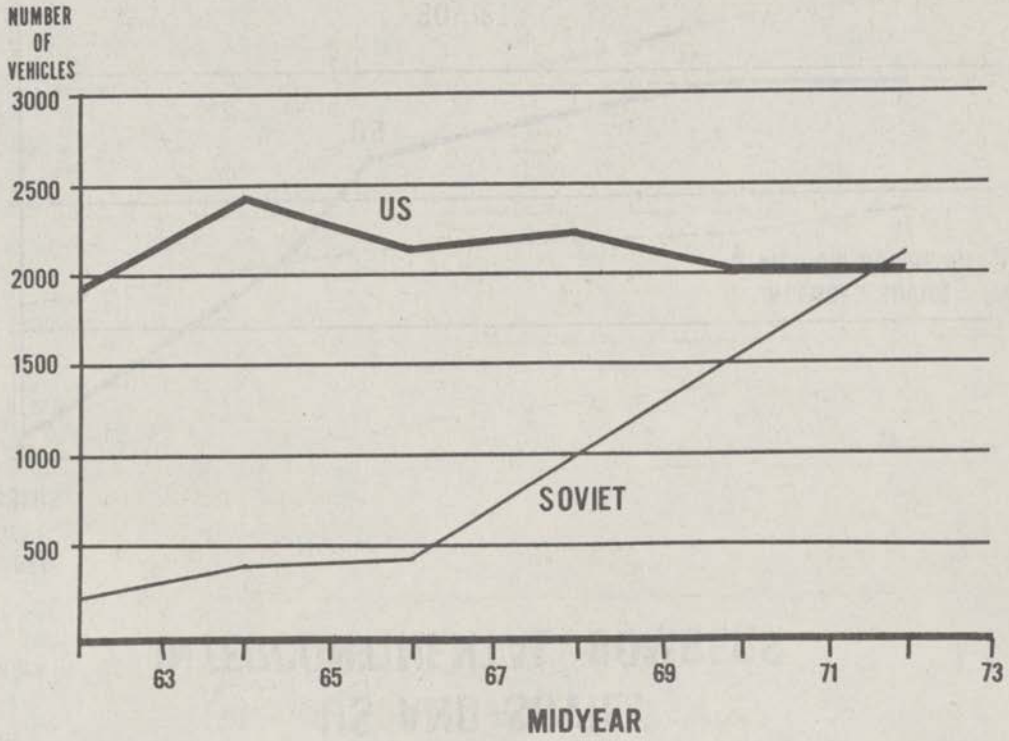


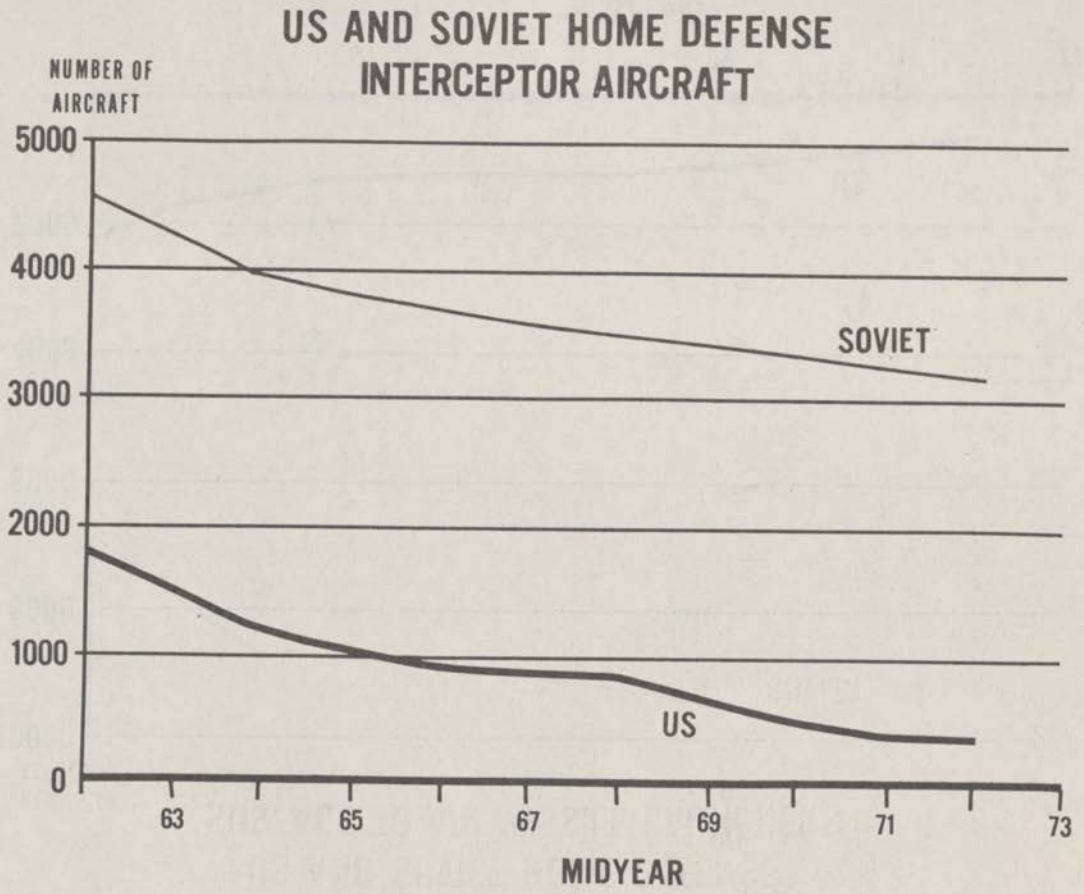

US AND SOVIET
SLBM LAUNCHERS
NUMBER OF
LAUNCHERS
1,200
1,000
800
600
400
200
0
US
SOVIET
63
65
67
69
71
73
MIDYEAR

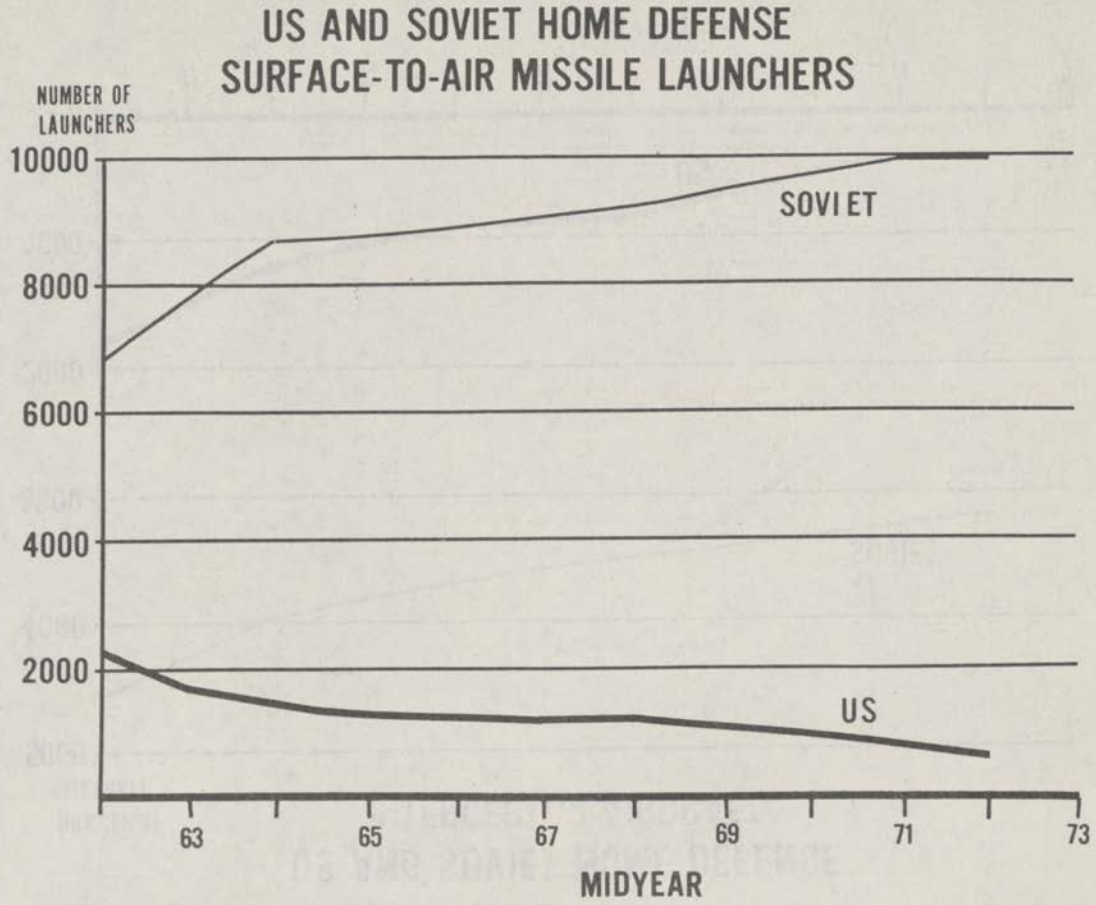
US AND SOVIET INTERCONTINENTAL BOMBERS



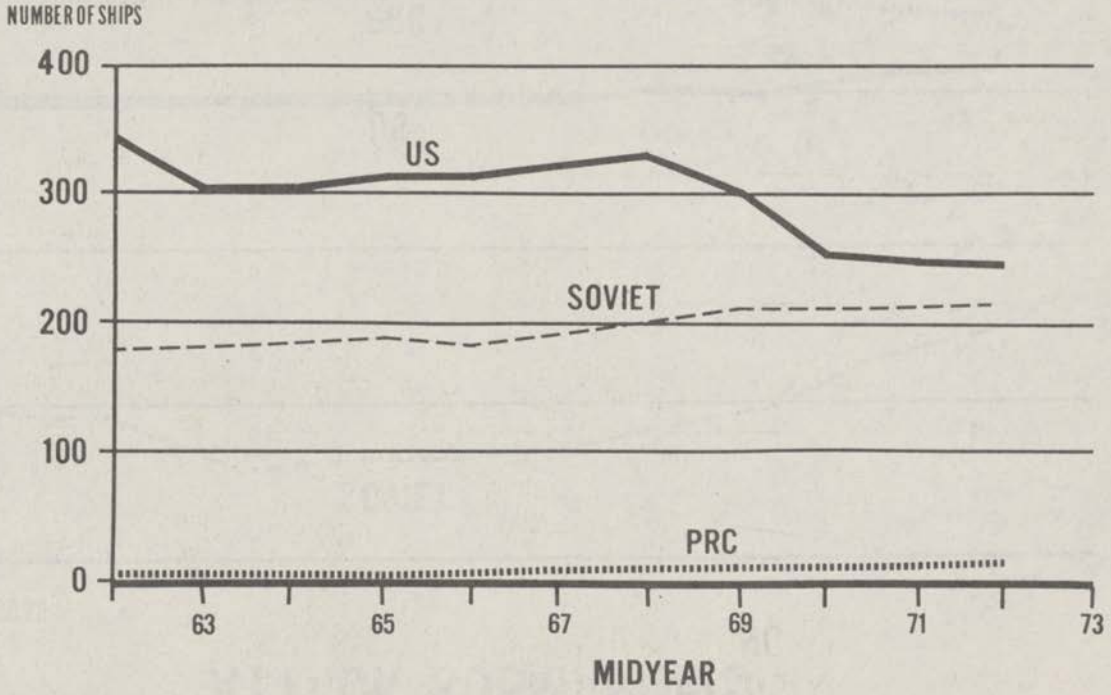
US AND SOVIET
INTERCONTINENTAL STRATEGIC OFFENSIVE DELIVERY VEHICLES
(ICBM LAUNCHERS, SLBM LAUNCHERS, AND INTERCONTINENTAL BOMBERS)



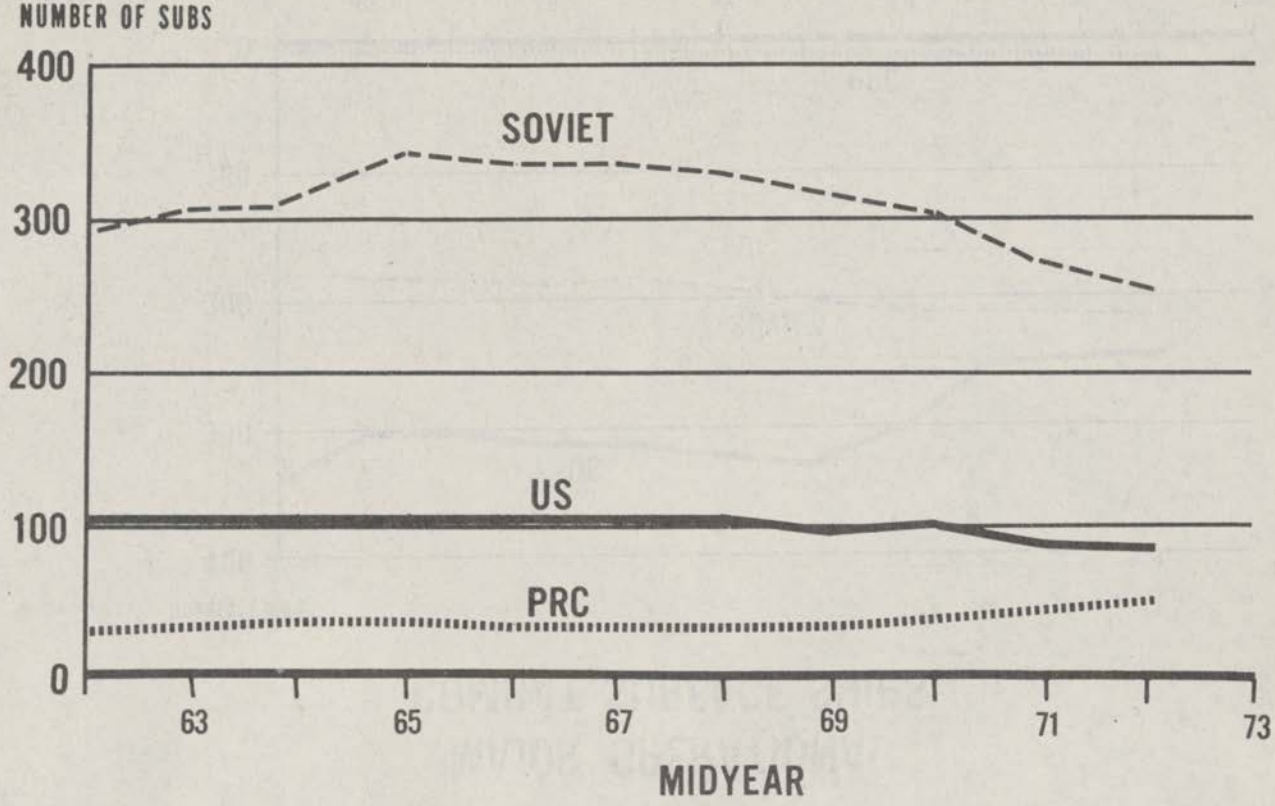

US AND SOVIET HOME DEFENSE
INTERCEPTOR AIRCRAFT
NUMBER OF
AIRCRAFT
5000
4000
3000
2000
1000
0
SOVIET
US
63
65
67
69
71
73
MIDYEAR


US AND SOVIET HOME DEFENSE
SURFACE-TO-AIR MISSILE LAUNCHERS
NUMBER OF LAUNCHERS
10000
8000
6000
4000
2000
SOVIET
US
63
65
67
69
71
73
MIDYEAR

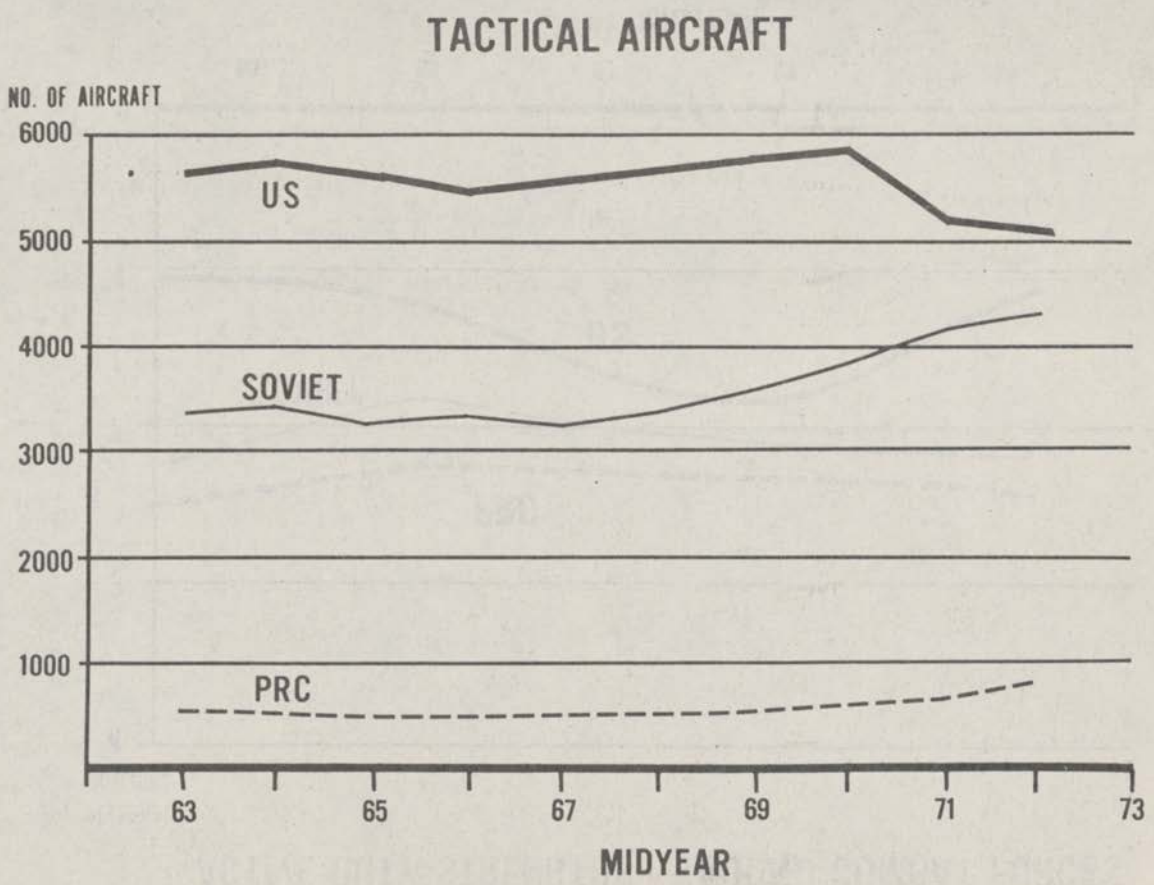
MAJOR OPERATIONAL COMBAT SURFACE SHIPS



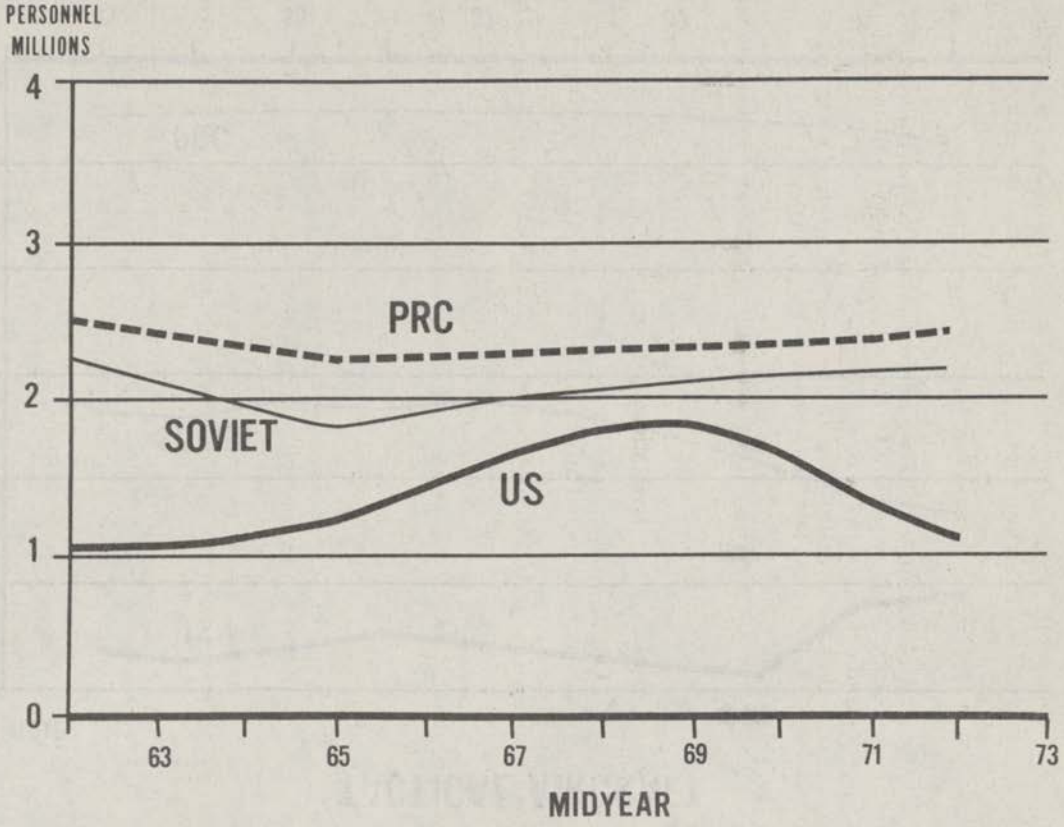
ATTACK SUBMARINES



572


TACTICAL AIRCRAFT
NO. OF AIRCRAFT
6000
5000
4000
3000
2000
1000
US
SOVIET
PRC
63
65
67
69
71
73
MIDYEAR

ACTIVE DUTY STRENGTHS - GROUND COMBAT FORCES



(Discussion off the record.)

Cooperation of Warsaw Pact Countries in Event of War

Chairman Ellender. Has anybody made a study of what cooperation the Warsaw Pact countries would give to Russia in case there is war?

Admiral Moorer. This is a good point because one must recognize that the forces that the Soviets have in the Eastern European nations have two tasks; one is to make sure they maintain control of their satelites and the other is to provide them a posture vis-a-vis NATO nations.

Now, what you have asked is an important question; however, there is no question about the fact that the Soviets do have sufficient forces to maintain control at the present time.

Chairman Ellender. Off the record.

(Discussion off the record.)

Chairman Ellender. Is there anything else you want to add?

U.S. Imperatives Responsive to Russian Activities

Admiral Moorer. Only to summarize and say that I have made an effort here to present to you a factual indication of what is taking place and what the comparison really is between the United States and Soviet Russia, I believe my figures are correct and that my data is the best available, sir.

I don't think anyone could quarrel with my statement that the relative position of the United States has certainly peaked and that the gap is being closed at this time. We cannot stand here today and take no action while this continues, bearing in mind the long leadtime associated with the development of any modern weapon system.

Chairman Ellender. I don't believe anyone wishes to do that, Admiral. My only wish is that more effort could be placed on dispelling the fear that exists on both sides. Unless that can be accomplished, both sides will continue to spend untold amounts on implements of war, to the detriment of their own economies.

(Discussion off the record.)

Subcommittee Recess

Chairman Ellender. We will recess until 10 o'clock Monday morning.

(Whereupon, at 4:40 p.m., Friday, February 25, the subcommittee was recessed, to reconvene at 10 a.m., Monday, February 28.)

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

MONDAY, FEBRUARY 28, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Young, Allott, Case, and Symington.

DEPARTMENT OF DEFENSE

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

STATEMENT OF DR. JOHN S. FOSTER, JR., DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

ACCOMPANIED BY:
CAPT. BENJAMIN F. SHERMAN, JR., U.S. NAVY
COL. PHILLIP N. LARSEN, U.S. AIR FORCE

BUDGET REQUEST

Chairman ELLENDER. The subcommittee will please come to order.

This morning, the Defense Appropriations Subcommittee will hear testimony from Dr. John S. Foster, Director of Defense Research and Engineering, on the total Department of Defense research program.

The total requests for research, development, test, and evaluation for fiscal year 1973, are $8,551,767,000. This compares to an adjusted total for fiscal year 1972, of $7,690,667,000 which includes $7,519,062,000 provided in the Department of Defense Appropriation Act for fiscal year 1972, $141,000,000 fiscal 1972 supplemental requests for program increases, and $30,605,000 fiscal 1972 supplementals for pay increases.

APPROPRIATION ALLOCATIONS

The 1973 requests are found in the following appropriation accounts:

"Research, Development, Test, and Evaluation, Army," $2,068,716,000;

"Research, Development, Test, and Evaluation, Navy," $2,729,987,000;

"Research, Development, Test, and Evaluation, Air Force," $3,193,177,000;

"Research, Development, Test, and Evaluation, Defense Agencies," $509,887,000; and

"Emergency Fund, Defense," $50 million.

PREPARED STATEMENT

Chairman ELLENDER. All right, Dr. Foster, you have a lengthy prepared statement, which I have read. You may proceed.

Dr. FOSTER. Mr. Chairman and gentlemen, I appreciate the opportunity to present the R.D.T. & E. budget of the Department of Defense for your consideration again this year. I pledge my full cooperation in working with you and members of your staff to seek your understanding and approval of this program which is so vital to our national security.

Mr. Chairman, I propose to proceed by reading sections of this summary, commenting on other sections of the summary, and then stopping at the end of the summary.

You may ask questions at any time.

PROGRAM AND FINANCING: EMERGENCY FUNDS, DEFENSE

Chairman ELLENDER. At this point in the record there will appear certain program and financing information on the "Emergency Fund, Defense" from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE - MILITARY

EMERGENCY FUND, DEFENSE

PROGRAM AND FINANCING (IN THOUSANDS OF DOLLARS)

	IDENTIFICATION CODE 07-20-0403-0-1-051	1971 ACT	1972 EST	1973 EST
	PROGRAM BY ACTIVITIES			
	DIRECT			
10	RESEARCH AND DEVELOPMENT CONTINGENCIES (RESERVE FOR TRANSFER) (OBLIGATIONS) (OBJECT CLASS 92.0)	.....	50,000	50,000
	FINANCING			
	BUDGET AUTHORITY	.....	50,000	50,000
	BUDGET AUTHORITY			
40	APPROPRIATION	50,000	50,000	50,000
41	TRANSFERRED TO OTHER ACCOUNTS	-50,000	.....	.....
43	APPROPRIATION (ADJUSTED)	.....	50,000	50,000

Chairman ELLENDER. Have you before you the whole document?

Dr. FOSTER. I have mine in looseleaf form. I would only propose to read parts of section 1 of the document you have in your hand, a fraction of the first 30 pages.

Chairman ELLENDER. And the rest is explanatory?

Dr. FOSTER. Yes; it expands on the first section. Of course, I will be glad to cover any item in detail.

Chairman ELLENDER. Should that go in the record?

Dr. FOSTER. Yes; the whole document should go in the record.

Chairman ELLENDER. Without objection, that may be done.

(The statement follows:)

1. SUMMARY

1.1 Introduction

Gentlemen, I appreciate the opportunity to present the RDT&E budget of the Department of Defense for your consideration again this year. I pledge my full cooperation in working with you and members of your staff to seek your understanding and approval of this program, which is so vital to our national security.

During the past few years, it has appeared that the mood of our country would permit the continued, gradual erosion of our military technological superiority. I am convinced that, from a position of technological parity or inferiority, a free society cannot confidently deter any aggressive tendencies of an autocratic and secretive society. Technical surprise in military weaponry could be extremely dangerous for ourselves and for our Allies. We must not permit our nation to be placed in a position of being caught off guard or unprepared.

We are requesting a Defense RDT&E budget for FY '73 which is 10 percent, or about three-quarters of a billion dollars, higher than that appropriated for FY '72, including the supplemental and cost of living adjustments. This represents an important decision by President Nixon and Secretary Laird that, in the interests of national security, we cannot afford the gradual loss of our military and technological and superiority--despite the very real existence of other pressing demands on our limited national resources.

The Defense RDT&E community bears the responsibility for assuring the continued adequacy of the military equipment by which we may uphold this nation's strategy of realistic deterrence. If the United States is to retain confidence in this strategy and in our future survival, then the retention of technological superiority in our military systems is absolutely necessary. We must recognize that the Soviets seek to achieve that superiority for themselves. If we allow ourselves to lose our edge to them, we will have forfeited our insurance policy on the future--for ourselves and for our Allies. Once lost, it could take many years and vast expenditures to restore. In fact, we might not be able to restore it in time to prevent some military or political disaster.

You will recall that last year I urged the Congress and other groups to examine this matter of the technical balance between the United States and the Soviet Union. We have worked extensively throughout the past year to determine and measure Soviet technological progress in the military area. The secrecy surrounding their efforts makes this a very difficult task. However, careful analysis of additional data supports and strengthens our conclusions that the U.S. military technological lead is being eroded because of the greater Soviet commitment of resources.

In the late 1950s, the Soviet leadership established as a national goal the attainment of world leadership in science and technology. It has been restated many times in recent years. It was restated by Premier Kosygin on 24 November 1971. The Soviets are convinced that they have already assumed leadership in some technological areas--and, in some cases, I believe, this is true. They believe they will dominate world science in the Twenty-First Century. Their depth of conviction, their steadily increasing devotion of national resources, and their apparent progress toward this goal are the basic reasons for our concern.

This year's proposed RDT&E budget represents a vital step toward U.S. recognition and acceptance of this challenge. Last year's approved

budget arrested the downward trend in purchasing power of the several prior years. The increase in this year's request is sufficient to eliminate the remaining apparent divergence in the relative efforts of ourselves and our potential, self-proclaimed adversaries. If granted in full, it will help restore the momentum needed to maintain our security --but it will not, by itself, eliminate the continuing disparity in overall effort which unfortunately will further erode our position in the near future.

There has been general agreement between the majority of the Congress and ourselves over the necessity for retaining an adequate level of effectiveness in our military systems. There are, however, valid differences of opinion over the size and composition of the programs needed to achieve it. In this summary portion of my statement, then, I wish to concentrate on six questions clearly relevant to your review of our submission.

* How do we propose to implement your FY '72 guidance?

* What progress did we make last year?

* What new assessment can we make of the technological intentions and momentum of our most likely adversaries?

* What are the deficiencies of greatest importance to our national military posture?

* How does our FY '73 budget reflect our efforts to remove these deficiencies?

* What efforts are we making to increase the productivity of our expenditures?

Responses to these questions are amplified in the main sections of my written statement, and they provide a more detailed explanation of our proposed program.

1.2 Response to Congressional Guidance

I wish to begin by reviewing briefly our responses to your decisions on the FY '72 RDT&E budget request. Valuable guidance is contained in the records of your deliberations, and this budget request responds to that guidance. In accordance with your findings:

* We have cut back the personnel ceilings at the "think tanks" for FY '72 and FY '73. We would welcome an opportunity to present to you this spring a plan for the future of each Federal Contract Research Center. These organizations provide support to OSD and the Services that is essential.

* We believe that there have been, and will continue to be, circumstances within the DoD that justify ad hoc agencies and task groups--as in industry and other branches of the government. In deference to your wishes, however, the Defense Special Projects Group (DSPG) will be disbanded by the end of FY '72, and the Army will not establish its proposed Institute for the Individual Soldier.

* We are pleased by your basic endorsement of the prototype approach. The Lightweight Fighter program is getting under way, and two competitive Advanced Medium STOL transport prototypes will be funded if more than one satisfactory technical approach evolves.

* The XM803 Main Battle Tank development program has been terminated. Instead, the Army will undertake a major product-improvement program for the M60A1 and begin a new competitive prototype effort with FY '72 and FY '73 funds. This may include the testing of selected new development models from other nations, with active participation by several potential U.S. producers.

* All Air Force work on the Mobile Minuteman has been deferred.

* The Navy has slowed design of the 2,000-ton prototype Surface Effects Ship pending the availability of test results on the 100-ton prototypes.

* We will continue to search for innovative, high-quality research talent, particularly among the newer and rapidly developing schools and state universities that have had little or no participation in defense research.

* In accordance with the Nelson Amendment, work on the Deep Underground Sanguine System (DUSS) is being held in abeyance pending the outcome of feasibility studies being conducted by the National Academy of Sciences and the National Academy of Engineering.

* Corrective steps have been taken by the OSD's Steering Group for Program Implementation/Execution to reduce the unobligated carryover funds for Fiscal Years '72 and '73 to the practical limit.

In the following two areas, we believe it is best to proceed along lines somewhat modified from your guidance:

* With regard to the Subsonic Cruise Armed Decoy (SCAD), a totally competitive system prototype development does not appear worthwhile. The Air Force will streamline management of the program by using the approach developed for their very successful gunship program, and will competitively develop the propulsion subsystem --which is considered to be a critical aspect of the program. As you know, this approach was discussed with, and agreed to, by staff members of both the Senate and the House Appropriations Committees after completion of the FY '72 appropriations action and prior to the Air Force's initiation of contractual action on SCAD.

* The Army's Heavy-Lift Helicopter (HLH) development program will meet both their requirements and the Navy's shore-based and/or LHA-based requirements. Major HLH components will be prototyped. The Navy/Marine requirement for a more capable helicopter to operate from LPH amphibious carriers is for a smaller craft providing about half the payload under comparable operating conditions. It will be met by a separately funded product improvement of the CH-53. One aircraft simply cannot do both jobs.

Mr. Chairman, I now propose to report on the progress made in some of our important RDT&E projects last year.

1.3 Highlights of the Past Year

Because our R&D program is so critical to our future security and because these efforts are supported at the expense of other national efforts, our programs deserve and receive intense scrutiny. At times, perhaps, there is a tendency to focus our attention on those few programs within our total effort that have not progressed satisfactorily. I would like to add some perspective by summarizing several of the programs, by mission area, in which we have made substantial development progress

within the last year. In addition, at the end of Section 1, I have included for your information a list of major new systems and equipments reaching operational inventory in the past six years.

In the area of strategic command and control:

* An early warning satellite system is reporting non-U.S. missile test launches.

* The first SOLRAD-10 satellite, launched in July, is now providing real-time monitoring of solar disturbances that affect space communications, navigation, and surveillance systems.

In the strategic offense mission area:

* The Air Force has completed deployment of Minuteman III missiles at Minot, North Dakota, slightly ahead of schedule and well within development program costs. System reliability has been demonstrated to exceed expectations. Minuteman III, with the MIRV payload, significantly improves penetration effectiveness, and its design increases its survivability and reliability over those of Minuteman I.

* The seventh FBM submarine has redeployed on schedule after conversion to Poseidon. Total development-program costs are still within 5 percent of initial 1966 estimates.

* The supersonic missile SRAM will enter service soon, having successfully completed its development flight-test program on schedule. SRAM will enable these bombers to attack terminally defended targets so that the bombers themselves will not have to penetrate those defenses.

* The full-scale B-1 mockup and preliminary design reviews have established the acceptability of the basic aircraft design. Meanwhile, the B-1 engine has been assembled and is beginning to accumulate test hours. The B-1 program maintains our strategic options over the next few years.

In strategic defense:

* In January 1971, the nearly simultaneous launching of two Spartan interceptors demonstrated the ability of the Safeguard radar and data processors to guide both interceptors--one to a live target reentry vehicle, the other to a specific point in space.

* In June 1971, the software package associated with the Safeguard missile-site radar data processor was tested. This demonstrated the capability to detect, verify, acquire, and track a simulated ICBM target.

* In November 1971, the Cannikin underground test successfully demonstrated the adequacy of the Spartan warhead.

* The second ABM test phase began in the fall of 1971. Most of the tests will use more complex intercept geometries. Several tests have already been conducted, and all have been successful. In fact, the success of this test program is unequaled by any other recent program.

* Construction at Grand Forks is now about 80 percent complete and 5 to 10 percent complete at Malmstrom after a labor problem delayed construction there for 11 months.

In the tactical air warfare area:

* The Navy's EA-6B electronic countermeasures aircraft has successfully entered final operational evaluation prior to joining operational units. The EA-6B is an important high-power jammer augmentation of our attack forces to ensure low attrition rates.

* The Air Force's A-7D attack aircraft achieved initial operational capability in March 1971, exceeding goals for system performance, weapon-delivery accuracy, reliability, and maintainability.

* Initial production of the Maverick electro-optical air-to-surface missile has been authorized, based on successful completion of all fly-before-buy requirements in June 1971. Air Force Category II testing was terminated early owing to the high success rate. This system, with its terminal guidance, will provide improved standoff capability against hard point targets.

* The joint Marine/Air Force all-weather bombing direction radar (TPQ-27) has almost finished engineering development--within costs and only slightly behind schedule. This mobile radar equipment can provide all-weather bombing in support of combat forces.

* The Navy's Condor standoff air-to-surface missile completed its initial flight demonstration in 1971. The Condor missile provides the U.S. a long-range "launch-and-leave" standoff weapon to be used against high-value targets.

* The Navy's F-14 flight-test program progressed satisfactorily during the year; the first preliminary evaluation by Navy pilots was successful. Its performance was considered outstanding, and some maneuver requirements were exceeded, according to Navy reports. The F-14 will provide the Navy with a sorely needed new fighter.

* Operational tests of the Marines' VTOL Harrier are proceeding very well, and are demonstrating the versatility of this aircraft in support of amphibious operations.

* The Joint Services In-Flight Data Transmission System (JIFDATS) has completed engineering development and entered flight evaluation in an RF-4C. JIFDATS provides faster video transmission of imagery information to a ground processing facility from airborne sensor systems.

* The competitive prototype "shoot-off" of the F-15's 25mm internal gun has been completed on schedule and within cost thresholds. The F-15 gun has the maximum rate of fire and muzzle velocity attainable with current technology. The caseless ammunition design will minimize installation weight.

* The engine for the Air Force's F-15 fighter is on schedule and should complete its preliminary flight-rating tests in February 1972.

* The F-5E Freedom Fighter successfully completed its critical design review in October 1971. The program is ahead of schedule and on target costs so far, with the first flight expected in September 1972. This aircraft is designed for successful operation against the MIG-21 and for ease of maintenance by our Allies.

* The Air Force's newest program to use a high-resolution, side-looking radar has successfully completed operational test and evaluation with outstanding results.

In the tactical land warfare area:

* Previous design deficiencies in the Army's M60A2 tank have been resolved and tested, and the tank is now entering production. This provides for the first time a tank with a missile capability for accurate firepower at a range more than that of tank guns.

* Lance successfully completed engineering development in 1971 and is now undergoing final Army engineering and service testing. (Testing has recently identified a possible warhead malfunction whose solution should not require additional funding or delay IOC.) The Lance surface-to-surface nuclear delivery system is scheduled to replace Honest John and Sergeant.

* The Army's concerted reliability-improvement program on the Improved Hawk has demonstrated 16 successes out of 18 flights. Production of the system has started to provide operational capability for field Army air defense in an ECM environment.

* The Army's Cheyenne helicopter successfully passed an extensive series of developmental tests, eliminating earlier problems of control-system instability. The program provides a new capability for direct aerial fire in support of ground forces during day, night, or adverse weather, in a more modern airframe with significantly increased performance, agility, payload, and standoff weapons delivery.

* Night flight tests of TOW missiles from the Cheyenne helicopter were highly successful, demonstrating for the first time the capability to acquire and attack armored targets from the air in total darkness.

* Army flight tests of helicopter equipment have proven their capability.

* The Army's UTTAS helicopter power plant has been selected following a highly successful advanced-technology demonstrator program. This utility tactical transport will provide a more reliable and cost-effective replacement for the UH-1 series used by all the Services and by other countries.

In the mission area of ocean control:

* The Mk 48 torpedo has moved into final operational evaluation prior to joining fleet inventories. The evaluation is going very well. The Mk 48 will replace the obsolescent Mk 37 torpedo. The Mk 48's antiship mode greatly increases its effectiveness against surface ships.

* The Mk I LAMPS helicopters have become operational on fleet frigates and will soon join the destroyer fleet for cruise-missile defense and ASW, extending ships' range capabilities.

* Thirteen sets of Versatile Avionics Shop Test (VAST) equipment have now been delivered and will soon be helping reduce maintenance time for sophisticated naval aircraft. First sea trials of the VAST equipment will take place aboard an aircraft carrier this year.

* The Navy's E2C program has demonstrated a fivefold increase in reliability and maintainability of this airborne early warning and command, control and communications aircraft over its prede-

cessors in a product-improvement program that is within DCP specifications and costs and is ahead of schedule.

* In a recent test, the Vulcan/Phalanx radar-controlled ship defense gun system successfully searched out, acquired, and destroyed a low-flying air target in a fully automatic mode. The program is within cost profiles.

* The Navy's new fast-reaction shipboard electronic warfare system for major combatant ships, Shortstop, successfully demonstrated its capabilities in sea trials.

* The S-3A carrier-based ASW aircraft has progressed through (1) a successful first flight and (2) a successful laboratory demonstration of the integrated avionics system--both two months ahead of schedule. The S-3A will replace the aging S-2, and will improve the effectiveness of carrier-based ASW against Soviet submarines.

* Captive flights of several candidate seeker heads for the Harpoon antiship missile were successfully conducted against ship targets. The prime contractor for Harpoon has been selected. This missile will provide the Navy a surface- and air-launched antiship weapon with a range of more than 50 miles.

* One of the highest risk electronic components of the Navy's Aegis surface-to-air missile system, the high-power transmitter tube, has successfully passed a 5,000-hour life test without failure.

* Weather satellite information is now being received directly by an aircraft carrier deployed in WESTPAC with a new test readout station aboard, shortening delays in the receipt of weather information.

In the area of the technology base:

* We have successfully demonstrated the ability to detect ballistic missiles and reentry vehicles in midcourse flight with infrared sensors aboard spacecraft. This suggests the possibility of our eventually being able to simplify some aspects of ballistic-missile defense.

* We have successfully test-fired controllable-thrust, restartable solid-propellant motors with integral thrust vector control. This could also be of great eventual value to advanced ballistic-missile interceptors.

* Three probably significant new electronic components were demonstrated in laboratory tests: (1) Charge-coupled devices promise to simplify low-light-level television systems by eliminating expensive vacuum-tube cameras; (2) microwave acoustic devices have the potential of becoming smaller, cheaper alternates for microwave signal processing required in electronic-warfare systems; and (3) solid-state transferred-electron amplifiers may replace more expensive traveling-wave tubes in many applications.

* Diving technology progressed rapidly. Tests have indicated that men can live, work, and breathe at pressure depths to 5,000 feet. Further devices have been developed to detect bubbles in a diver's blood and to prevent loss of body heat to cold gas inhaled from bottles.

* Graphite-fiber/epoxy technology has progressed far enough to justify the fabrication of horizontal stabilizers and wing flaps for the Navy's A-4 attack aircraft. Potential payoffs are weight reduction of 30 percent and fatigue-life increases of 200 percent over those of current aluminum structures.

* Large-scale machine-aided translation of English technical material to Vietnamese was demonstrated, and significant improvements in the Russian-to-English system were completed.

* Animal tests of spinal-cord injuries have shown that severity is largely dependent upon swelling. Injury can be reversed by operation and drugs as late as four hours after its occurrence.

* New drugs showing substantial promise against chloroquinine-resistant malaria have been successfully tested in humans and animals. Human tests for safety of a vaccine against malaria have been started.

Even though we have made substantial progress during the past year, we still have many problems. As you know from your review of Selected Acquisition Reports, the most frequent problem is cost. Because of unexpected technical problems, bad initial estimates, and inflation, many development programs still grow in cost and development time. Even if they are fully successful, when finally completed they carry the stigma of failure. Classically, the entire RDT&E community--and the military themselves--have favored performance over schedule and schedule over cost. During the coming year, we plan to concentrate even more on readjusting these priorities, until cost becomes as important as performance and schedules are delayed to accommodate both.

As you know, we have specific programs with specific problems. They are typified by the following examples:

* The loss of the first F-14 delayed the program. That delay, combined with cost growth, has caused the program to be restructured. The contractor has announced that he will not honor further production options under the contract.

* After a successful launching of two new Defense communications satellites in November, the satellites failed to respond properly. The problem is being investigated.

* The Condor air-to-surface missile was a case of expecting too much performance too soon. Because of delays and reduced procurement quantities, costs have risen substantially.

* Inflation has driven the unit cost estimates of the S-3A ASW aircraft up by $1.1 million per aircraft. When the development contract was awarded in August 1969, it was expected that we would be able to procure this aircraft for a unit cost of $11.5 million. The current estimate is $12.6 million. The increase is attributable to the fact that actual rates of inflation were higher than expected and contractor overhead rates increased because of the reduced overall level of business activity.

* The Mk 48 torpedo, an excellent example of how competition can reduce unit cost, as well as improve the final product, had severe technical problems early in its development because we underestimated the technical complexity. Most key performance criteria have been met, but at a high cost.

* Although the A-7D/E attack aircraft is a very successful program from the viewpoint of performance, unit costs exceeded original estimates by $900,000 per aircraft as a result of production stretchout, reduction of the total aircraft buy, and added features.

* The Lance surface-to-surface missile program is late and costs have risen because of significant design changes to solve technical problems.

* The Cheyenne program, while out of the woods technically, is currently projected to be about 85 percent more expensive than was planned, partly as a result of adding night vision and TOW capabilities to the original requirement.

* The MBT-70 tank design became too expensive, so we reoriented the program to develop an austere version with somewhat reduced performance and a 30-percent lower production cost. It is now evident that this reorientation, while in the right direction, did not go far enough.

1.4 Soviet RDT&E Activities and Results

A large portion of my statement last year was devoted to our concern over expanding Soviet military technological investments and capabilities. Our major focus still remains on that Soviet challenge, and we have further evidence to accentuate that concern. I would now like to give a short summary of our efforts this past year to assess the importance of Soviet RDT&E activities relative to the present and future security of the United States.

Mr. Chairman, I must stress this point: We are not comparing ourselves with the Soviet Union strictly on a budget-to-budget basis in the hope of wringing larger budgets from the Congress. We are comparing ourselves with them because a comparison of today's RDT&E programs in type, scope, and level provides one of the major indicators of possible future challenges to our security.

In retrospect, it is clear that Soviet leaders made a fundamental decision some years ago regarding the role of the U.S.S.R. in the international arena that will continue to dominate their policies in the 1970s--to overtake and surpass the United States in military prowess and in scientific preeminence. Observers, both inside and outside the government, are beginning to share our appreciation of what such a Soviet decision and commitment can mean to the United States.

The sincerity of the U.S.S.R.'s commitment to the goal of technical military superiority is evidenced by the manpower, facilities, and material resources it has allocated to produce the modern weapon systems that it has developed and deployed in large numbers.

* In the past 10 years, the Soviet Union has surpassed the United States in the number of scientists and engineers holding advanced degrees.

* Capital investments in Soviet military RDT&E have grown substantially during the past decade.

* Soviet naval research institutes have nearly doubled in number during the past decade, while U.S. naval research facilities have, on balance, decreased.

* The Soviets have taken notice of past U.S. reductions in military RDT&E expenditures, but their public statements and new five-year

plan describe a continuing and systematic increase in their own efforts.

* The Soviets are openly demanding of themselves a more efficient, productive RDT&E effort with more "output per ruble."

We remain convinced that our current U.S. technological superiority is in jeopardy, and consequently we will continue our concerted study of these matters.

During the 1960s, many significant Soviet military systems were developed--a comparable output to that of the United States, though often in different areas. These systems include the world's fastest interceptor, the world's largest strategic missile and the world's largest helicopter. More than 50 new ships of all classes were developed, many aircraft systems were modified for naval use, and naval missiles and naval guns were developed. Also, new systems for the Army were produced, including armored vehicles, artillery, antitank weapons and a new tank.

Many of the significant "outputs" of operational systems in the 1960s were based on research resource "inputs" during the 1950s. The growth in RDT&E resource inputs during the 1960s indicates a continued Soviet commitment to new and improved systems in the 1970s. Since the past program of Soviet activity has yielded a steady and regular output of military equipment, the 1970s should reveal a continuation of equipment improvements and a growing inventory of significant new weapon systems. As a matter of fact, many new weapon systems will continue to appear, even if funds for new capital investment in R&D are sharply curtailed in the near future--since the prerequisite research is well along and Soviet momentum appears to be considerably greater than ours.

Within the 12 months since I last appeared before you, we have noted with some concern various new developments within the Soviet Union that suggest important new emerging military capabilities.

New items that we note represent only the visible tip of a much larger iceberg. It is evident that we must increase our intelligence-gathering capabilities in the RDT&E area, as Mr. Laird has noted in his testimony. Consequently, we are deeply concerned by recent congressional cutbacks in our national intelligence-collection efforts.

Mr. Chairman, it is not necessary to emphasize to this committee that the continuing Soviet commitment to science and technology is in marked contrast to strong sentiments from a segment of the American public and some members of the Congress. The Soviets firmly believe that a strong national RDT&E program can provide the mechanism for their becoming the world's dominant economic, political and military power. It could be very unfortunate for the United States if inadequate support were given to the military RDT&E by which we maintain our slim and dwindling technological lead.

With regard to relative productivity, I talk frequently with our own university scientists who, in turn, are openly engaged in discussion and exchange with their Soviet counterparts regarding nonmilitary R&D. They assess the scientific productivity of Soviet universities and institutes as significantly less than our own--and their Soviet counterparts tend to agree. Although Soviet scientists are credited with as much brilliance and initiative as ours, they apparently lack the dynamic freedom of action, the instrumentation, and the responsive support that are provided in our universities and non-Defense laboratories. Apparently the Soviet priority system constrains scientists in the civil sector, while allowing more freedom to defense scientists--whom we almost never see. This would, I believe, account for any disparity noted between the observations of our

university scientists and those of our intelligence community, and is confirmed by the relative output of the civil sector when compared to Soviet space and military achievements.

The importance of our retaining technological superiority appears to be clear. Realistic deterrence depends on the knowledge and measurement of the relative strength of the U.S. and our Allies vis-a-vis our potential adversaries. As long as we retain technological superiority, we can make meaningful measurements of relative strength without fear of surprise. We can estimate their progress because we've already been there. Our free society can then compete more confidently and efficiently with secretive opponents. Once we appear to have lost that superiority, we lose our ability to measure our relative strength and to compete efficiently, and in due course we should lose confidence in the realism of our deterrence.

I would like to illustrate the current U.S. technological position relative to the Soviet Union's by some simple side-by-side technical comparisons of equivalent operational systems. I must stress from the outset that this is not what I will refer to later as a net technical assessment of combat capabilities; it is a far simpler and more primitive technical comparison of presently deployed U.S. and Soviet systems side by side, not face to face. It may reveal to you a more modest appraisal of our present superiority than you expected. We would currently credit Soviet-deployed forces with technological superiority in--

* anti-ballistic-missile systems**
* fractional-orbit ballistic missiles**
* strategic air-defense interceptors
* all aspects of civil and industrial strategic defense and recuperative planning
* tactical antiship missiles
* surface attack ships (excluding carriers)
* antiaircraft artillery systems
* some armored combat vehicles
* medium- and high-altitude SAM air defenses
* surface-to-surface tactical missiles
* heavy-lift helicopters

We would currently acknowledge approximate technological parity with Soviets in deployed systems such as--

* tanks and antitank weapons
* satellite tracking systems
* satellite navigation systems
* small arms

But we believe we still retain our technological lead in deployed systems in--

* ICBM guidance and penetration aids
* strategic bombers
* strategic submarines and SLBMs
* attack submarines
* ASW sensors and patrol aircraft
* satellite communication systems
* airborne warning and control systems
* airborne surveillance sensors
* defense-suppression weapons and systems
* deep-strike tactical aircraft
* aircraft carriers

**On these items, the U.S. has no deployed capability at this time.

* guided ordnance
* air-to-air superiority weapons
* man-portable air-defense systems
* close-support helicopters, aircraft and aerial weapons
* long-range logistic transports
* artillery munitions

Various experts are certain to disagree with individual details of these statements. However, the point here is not that we must excel in every area of warfare. It is simply to acknowledge that we have already reached a point in many areas where we do not excel. Relative to the popular image of unquestioned U.S. technological supremacy of the 1940s and 1950s, it is evident that we have not held our own against determined competition. More important, in those areas where we acknowledge technological parity or inferiority, we cannot have high confidence in our estimates of Soviet capability, nor can we predict with confidence what their next step forward will be.

We must continue to focus on the need to maintain--and, where necessary, regain--a realistic level of technological superiority, particularly in our operational systems. I see no security for us in pausing at some technological plateau when the Soviets appear committed to continuing their own impressive rate of progress. There is ample evidence that they are so committed--and none to the contrary.

Let us now turn to an assessment of the relative technical military capability of the United States and the Soviet Union in terms of the military systems that would oppose each other in combat, i.e., offensive systems of one side against defensive systems of the other. It is the following assessment that identified our primary deficiencies--hence, our proposed RDT&E programs--not the foregoing treatment of comparable systems.

1.5 Net Technical Assessment

Much of the testimony of the Chairman of the Joint Chiefs of Staff deals directly with the declining relative military power of the United States. I would like to quote the following excerpts from Admiral Moorer's statement:

> There can be no question that during the past five years we have witnessed a most dramatic shift in the balance of military power--and particularly strategic nuclear power--between the United States and the Soviet Union. . . . We no longer have that predominance of strategic power which for about a quarter of a century has significantly contributed to our avoidance of nuclear war and which has been such a major factor in the defense of Western Europe.
>
> Indeed, the question now before us is how best to maintain the security of the United States and its allies in the face of the significant increase in Soviet military capabilities.
>
> With regard to the balances between the general purpose forces of the Soviet Union and the United States, the Soviets are slowly coming abreast of us in relation to our tactical air forces and are continuing to widen the gap in relation to our ground combat forces. In addition, a major shift in the naval balance between the United States and the Soviet Union is also taking place.

To assist in evaluating the relative strengths and weaknesses of our opposing forces, the Department of Defense has given considerable emphasis

to its net technical assessment program this past year. For selected critical areas, not all of which are discussed here, these investigations allow a determination of how well the Soviets are doing in achieving their goal of technical military superiority over the United States. In each case, we have sought to identify any of our deficiencies and to determine the adequacy of the steps being taken to eliminate them.

Assessments have been made of the relative military capability of Soviet and U.S. forces in the critical areas of strategic forces' survivability, the penetrability of ballistic-missile defenses and air-defense systems, and ocean control and overseas force projection.

In addition, U.S. tactical warning systems for our strategic forces and the present basing of our strategic bombers are not satisfactory.

The United States can no longer feel assured that it has unquestioned technical superiority over the Soviet Union. In my view, we must regain our earlier advantages of bomber survival and penetrability and in ability to project our forces, via sea power, to those places where we have vital interests.

It is important to understand the changing technological position of each side. I will now briefly summarize several of our assessments for selected critical areas, and briefly describe those actions we are taking to correct important U.S. deficiencies.

1.5.1 Strategic Bombers: The momentum of Soviet developments in submarine-launched ballistic missiles and in sophisticated air-defense systems can have a serious impact on the survivability and penetrability of our strategic bombers unless corrective measures are taken by the United States.

The deficiency in survivability has led to the following corrective programs:

* A new warning satellite system has been developed, and initial deployment begins this calendar year. Improvements in the 474-N early warning radar system are also in progress. When these programs are completed, an adequate early warning system should be available.

* The New Look Plan of SAC provides for a phased relocation of bombers and tankers to inland bases and reduced reaction times for crews and aircraft.

Bomber penetration of Soviet air defenses will be assisted by--

* Continued development and deployment of SRAM to counter Soviet point air defenses.

* Development and deployment of new ECM and terrain-following equipment for the B-52.

* Development of SCAD to assist in the penetration of Soviet area air defenses.

U.S. countermeasures, if pursued on the present schedule, should provide adequate penetration capability for the B-52/RF-111 forces against present and projected threats through the 1970s. The SRAM and SCAD missile inventory, the revised bomber-base structure, and the tanker forces provided for the B-52/RF-111 systems will be used by any future B-1 system. The B-1, with its many system improvements, is expected to

provide the U.S. with a survivable and effective bomber force through the 1980s.

1.5.2 Strategic Missiles' Penetrability: We have many reasons to believe that the Soviets are making a substantial effort to improve their anti-ballistic-missile capabilities. In support of our Strategic Arms Limitation Talks, we have studied the possibilities of product improvement to their SA-2 and SA-3 SAM systems to make them ABM-capable.

Because of our current lack of knowledge concerning exactly what the Soviets are doing with their terminal ABM RDT&E programs, we have examined what the United States might do that would be least sensitive to any of the alternatives believed practical for the Soviets. We have concluded that a reentry vehicle that maneuvers to evade the ABM interceptor, coupled with appropriate exoatmospheric "pen aids," will provide the penetration system that is least sensitive to present and reasonable postulates of future Soviet terminal ABM defenses.

1.5.3 Ocean Control: Admiral Moorer has discussed in some depth the threat presented by the rapidly expanding Soviet naval forces and their air- and sea-launched antiship weapons. The Soviets have already demonstrated in several exercises their ability to conduct coordinated attacks involving aircraft, surface ships and submarines, and cruise missile systems against a simulated carrier task force. They have developed a good surface ocean-surveillance capability and an extensive command, control and communication network. Our capability to defend our fleet--in confined bodies of water such as the eastern Mediterranean --has not kept pace with the growth of this threat. Extensive changes in our own surface naval forces--including their tactics and offensive and defensive weapons--and in the types of ships themselves appear to be required, and your support for these developments is requested.

1.5.4 Sea-Launched Ballistic Missiles: The Soviets have expressed interest in developing a strategic ASW force that can effectively locate, identify, and destroy our Polaris force, should they desire to.

We have initiated the development of ULMS for two main reasons: (1) the Soviets' possible development of undersea surveillance and associated ASW systems that could progress more rapidly than our ability to develop and deploy new long-range missile systems and (2) the possible loss of overseas bases. In addition, active programs on improvements in sonar systems and submarine quieting are being pursued. The pursuit of ULMS and other programs should ensure our continued confidence in the survival of our sea-based deterrent through the 1980s.

There are many other mission areas in which our military posture requires improvement if we are to retain a meaningful technological superiority in face-to-face engagement with the enemy.

We have reexamined the analysis of technological lead time that I presented to you last year. We have applied this to comparable emerging military systems, not just to laboratory applied science. Considerable effort was given to trying to determine truly comparable Soviet/U.S. weapon systems, comparability in mission, and comparability in applied weapon-systems technology. Our reexamination shows that, in the aggregate, the U.S. enjoyed a 2-year technological lead over the Soviet Union in the early 1960s and that this lead has slowly decreased to roughly parity in many comparable systems in 1970.

These independently derived results, though somewhat more pessimistic, are in essential agreement with what I presented to you last year. A briefing of these investigations will be made available to this committee if desired. This reexamination, plus the results of the net technical

assessments that I have just described, support our concerns over the diminution of U.S. technological superiority over the Soviet Union.

Mr. Chairman, at the risk of repeating myself, I wish to emphasize again why I sometimes appear preoccupied with comparisons between our own developmental efforts and those of the Soviet Union. It is through these comparisons that we gain a major insight into possible threats to our future national security. We believe that we have a serious problem. Our determination to retain technological superiority in our operational forces must be revitalized. We are not asking you to outspend the Soviets, because that is not a realistic approach. We are asking you to grant increases in spending on specific programs that can help significantly to retain--or reestablish--our technological superiority in those mission areas that we consider to be the most crucial.

The FY '73 research and development program that I will now describe is a critical step toward arresting the loss of our technological lead. It is aimed primarily at eliminating our assessed deficiencies in opposing systems, not at restoring total technological superiority in equivalent systems.

1.6 Major Budget Items

I would like to outline in general terms the reasons for the three-quarters of a billion dollars' increase in this year's budget request. Though many hundreds of projects contain compensating increases and decreases, the major thrust of our overall increase in emphasis is in the following areas:

	Net increases from FY '72 (including the supplemental)
* A 6-percent increase in funds for basic research and exploratory development--the fundamental source of our continued technological superiority.	$ 97 M
* Operational test and evaluation.	32 M
* Strategic sea-based offense.	413 M
* Strategic bombers and penetration aids (B-1 and SCAD).	111 M
* Strategic and tactical warning, command, control and communications (AWACS and ABNCP).	51 M
* Field Army air defense (SAM-D and MANPADS).	73 M
* Close air support (AAFSS).	40 M
* Air logistics and mobility (UTTAS, HLH, STOL).	81 M
* Ocean surveillance.	65 M
* Fleet offensive systems (Harpoon and ship design).	34 M
Total increases:	$ 997 M

There are, of course, some significant compensating decreases from last year's budget that result primarily from major systems now past the peak of their development funding requirements:

* Decreased funding requirements for antisubmarine warfare (primarily the S-3A).	$	170 M
* Decreased funding requirements for land-based offensive strategic missile systems (primarily Minuteman).		22 M
* Decreased funding requirements for land-based defensive strategic missile systems (primarily Safeguard).		40 M
* Miscellaneous decreases in smaller programs.		5 M
Total offsetting:	$	237 M
Net RDT&E budget increase:	$	760 M

You will note that these increments and decrements assume approval of the FY '72 supplemental request. The reasons for the urgency of that request are provided in the Secretary's statement accompanying its submittal.

As you probably realize, a negligible fraction of this FY '73 budget supports our forces in Southeast Asia. With the exception of minor programs to improve our presently continuing air-interdiction campaign, the R&D contribution to that war is complete. The savings in funds from those required to support the war in prior years have permitted a substantial increase in RDT&E programs that can be undertaken without increasing total expenditures.

1.7 Increasing RDT&E Productivity

Some challenging problems in RDT&E management are produced by the conflicting pressures between the desire to keep expenditures down and the need to increase the rate of improvement of our overall defense potential in a fashion commensurate with rapid Soviet progress.

As you have recognized, this situation requires that we exert every possible effort to increase the overall productivity of our RDT&E efforts as a means of minimizing growth in the RDT&E budget. Among the accomplishments of the past year are the following:

* We have decentralized and strengthened the authority and motivation of the Services in managing their own programs, while redirecting OSD efforts to the problems of general planning, review and guidance of the overall effort--through the use of Area Coordinating Papers, Technology Coordinating Papers, and Development Concept Papers (see Section 2.1).

* We have simplified the basic acquisition process by the elimination of half of the 125 directives and instructions governing weapon-systems acquisition.

* We are shifting our major ongoing systems developments to a fly-before-buy basis to the maximum practical extent (see Section 2.3).

* Contracting procedures have been shifted away from total package procurement toward individual types that better reflect the risk involved. We are shifting contract emphasis from scheduling to achievement as the precursor of further funding, and we are insisting that all contract changes be fully priced out before they are approved.

* An independent parametric cost analysis is now required on each major defense system at the key program decision points.

During this coming year, we intend to focus on the following:

* Greater emphasis on assessing the present and anticipated threat to our capabilities through an expanded net technical assessment effort (see Section 1.3).

* Greater emphasis on discrete programs to eliminate specific deficiencies identified by our mission-area assessments.

* Greater concentration of our R&D efforts in areas of high potential payoff through the stimulation of new initiatives (see Section 2.2).

* Greater use of several categories of prototypes to hasten the conversion of new discoveries to practical applications, and to demonstrate methods of lowering system costs (see Section 2.3).

* Constraining some of our strategic developments to prototype status until the anticipated threats against which they would provide a hedge become better defined (see Section 2.3).

* Greater concentration on the use of production unit cost as a basic design parameter during concept formulation and engineering development.

* Better incentives to encourage the elimination of marginal requirements in systems development that contribute more to cost than to effectiveness.

* Greater emphasis on increasing the readiness and decreasing the life-cycle costs of our new systems by placing greater stress on the achievement of high reliability and easy maintainability--and on demonstrating it in the test and evaluation phase (see Section 2.4).

* Greater effort to adapt Allied developments to our own requirements as a means of increasing the productivity of the Free World's combined efforts (see Section 2.5).

During this next year, we hope to make significant progress in the basic problem area of improving the weapon-systems acquisition process. We are following the Senate Armed Services Committee's hearings on this issue, and we welcome constructive suggestions from the Congress to help us in this difficult task.

1.8 Past Productivity

We frequently hear the criticism that, out of all our recent RDT&E expenditures, nothing useful has gotten into the hands of our forces. This is simply not the case. Here are many of the major systems that have, in fact, joined our operational inventory since I first came before you, in early 1966:

Strategic Systems

Poseidon
Minuteman II
Minuteman II pen aids
Minuteman III
FB-111
440L Over-the-Horizon (OTH) radar
FPS-49 radar
Communications satellites
Navigation and weather satellites
Surveillance and early warning satellites
Titan IIIC payload booster

Tactical Aircraft Systems

**Cobra attack helicopter
F-111 attack aircraft
A-7 attack aircraft
**A-37 attack aircraft
AV-8A VTOL aircraft
**AC-119/123/130 gunships
**OH-6/OH-58 helicopters
OV-10 attack/observation aircraft
C-2 carrier logistic aircraft
C-141 transport
C-5A transport
CH-53 helicopter
E-2 early warning aircraft
P-3C patrol aircraft

Tactical Missiles and Ordnance

**M-16 rifle
M-60 machine gun
**M-72 light assault weapon
M-79 grenade launcher
**7.62 miniguns
COFRAM munitions
TOW antitank missile
Shillelagh antitank missile
Chaparral antiaircraft missile
Redeye antiaircraft missile
Seasparrow antiaircraft missile
Vulcan antiaircraft weapon
**Standard ARM missile
**Talos ARM missile
Mk 46 torpedo
**Mk 36 destructor
**BLU-61 bomb
**Rockeye munition
**Laser-guided weapons
**Walleye/Hobo guided weapons
**FAE munitions
**CBU 24/49 cluster munitions
**WAAPM antipersonnel mines
**20mm gun pods
**2.75-inch rocket with warhead
New bomb fuzes

**These items were stimulated or accelerated by the pressures of the war in Southeast Asia.

Combat Vehicles

**M551 Sheridan vehicle
Gamma Goat rough-terrain vehicles

Sensors, Command, Control and Communications, and Intelligence

Remote ground sensors and equipments
New FLIRs for night attack aircraft
New aircraft fire-control radars
New aircraft laser designation system
New ground satellite terminals
New tactical radio and teletype sets
Omega navigation system
**Loran D navigation system
**PPS 4/5, TPS 58 surveillance radars
**3 types Starlight Scopes
Long-range communications networks
**Laser rangefinders
New aircraft ELINT/ECM equipments
New aircraft cameras
New reconnaissance drones
New intelligence-processing systems
DIFAR sonobuoys
New sonar systems
Mark XII IFF equipment
Marine tactical data system.

Important new capabilities have also been provided at lower cost through the product improvement of sound existing systems. Since 1966, the following significant product-improvement designs have joined our operational inventories:

Strategic Systems

Polaris hardening
Minuteman hardening
Titan IIIB/D payload boosters
Improved communications satellites
Improved weather satellites

Tactical Missiles and Ordnance

Hawk improvements
Tartar/Terrier improvements
High-Drag Snakeeye bombs
**AIM-7E2 air-to-air missile
AIM-4D-8/9 air-to-air missile
**AIM-9E/G air-to-air missile

Combat Vehicles

M60A1 tank

Tactical Aircraft Systems

A-4E/F/L attack aircraft
EKA-3B ECM aircraft
**A-6C/E attack aircraft
**EA-6A ECM aircraft
A-7B/D/E attack aircraft
F-4E with M-61 gun

F-4J with AWG-10 fire control
F-8 H/J/K/L fighters
**F-105 Wild Weasel ECM aircraft
F-111C/E/F
OV-1D surveillance aircraft
**OV-10 night attack modifications
**B-57G night attack aircraft
E-2B early warning aircraft
**UH-IN twin-engine HUEY
**HH-53C rescue helicopter
ELINT aircraft

2. MANAGEMENT IMPROVEMENTS

2.1 Management Controls

During 1971 we continued to improve the management of the total RDT&E program and the defense systems-acquisition process on several fronts. We are simplifying the management process, transferring back to the Military Departments authority to manage their major programs and concentrating the functions of the Office of the Secretary of Defense in areas of general planning, policy formulation, and the evaluation of policy implementation. Primary policy emphasis has been on improving and expanding the use of management tools developed over the past several years. Primary planning emphasis has involved the establishment of a series of functional mission areas corresponding to facets of military operations. This provides a framework in which to assess the adequacy and pertinence of specific related development programs.

We have significantly increased the use of Area Coordinating Papers, Development Concept Papers, and Technology Coordinating Papers for the overall planning and decision-making process. Collectively, these papers are designed to provide one primary means of determining priorities for development and controlling our major acquisition programs. Here is a short description of each of these documents:

* The Area Coordinating Paper (ACP) summarizes military needs and capabilities with respect to a specific defense mission, and relates those needs to the set of systems expected to be available, taking account of inter-Service relationships, in order to satisfy requirements of the total defense mission. Each completed ACP becomes the "best thesis" and overview of that specific mission, its purpose being to aid the Secretary of Defense in decisions relating to the adequacy of current capabilities, undesirable overlaps, and gaps that should be filled. Typical subjects of ACPs are undersea (ocean) surveillance, air-to-ground munitions, close combat, and air superiority.

* The Development Concept Paper (DCP) is a 20-page coordinated issue paper on a specific program to acquire a major defense system. This document becomes (1) the vehicle for program decisions by the Secretary of Defense, (2) the record of primary information on the program, the decision rationale, and decision-review thresholds, and (3) the instrument by which decisions are implemented. When approved, the DCP becomes a contract between the Secretary of Defense and the Secretary of the Department sponsoring the program. Some of the defense systems covered by DCPs are the F-15 fighter aircraft, the Harpoon antiship missile, and the Armed Reconnaissance Scout Vehicle (ARSV).

* The Technology Coordinating Paper (TCP) is a summary and analysis of a selected technical or scientific area within the technology base. It defines specific technological advances in the subject area that are needed to meet future military requirements and to solve current problems, identifies DoD technology programs in progress or planned, and points out specific technological gaps that should be filled. TCPs have been prepared, for example, on materials technology, medical and life sciences, and aircraft propulsion.

We now have two approved ACPs, 31 are being prepared, and six more are planned. We have 40 approved DCPs, 22 now in preparation, and five more planned. The 67 DCPs control roughly 60 percent of the RDT&E systems-development dollars for FY 1973. An additional 6 percent of those dollars, reflecting another 40 smaller programs, is controlled by the Program Memorandum (PM), which is a simpler and less formal document than the DCP. Thus, DCPs and PMs bring under control approximately $3.710 billion, or 66 percent of the systems-development dollars for FY 1973. As for TCPs, we now have five approved, four being prepared, and three more planned.

To illustrate the relationship of these three kinds of document, the ACP on undersea (ocean) surveillance addressed the total mission of undersea surveillance. Each of these programs is described in a DCP which will draw upon some of the technologies summarized in the TCPs for electron devices, materials technology, and environmental sciences and in the planned TCP on subsurface vehicles.

The Defense Systems Acquisition Review Council (DSARC), together with the DCPs, continue to support the Secretary of Defense and the Deputy Secretary in their decision making. During 1971, the Council reviewed 16 major defense systems. The usefulness of this DCP/DSARC process can be illustrated by several significant program changes resulting from it.

* In the Army's UTTAS (Utility Tactical Transport Aircraft System) program, the large increment of life-cycle costs relating to reliability, maintainability and vulnerability were highlighted by means of this process. Stringent goals in these areas were prescribed to the Army. The Council also held the UTTAS design within minimum needs of the basic mission, rejecting pressures to permit the cascading of requirements which, to satisfy, would tend to make the entire UTTAS fleet more expensive.

* The Navy's plan for developing the Captor Mine was changed as follows: (1) a series of significant performance milestones was incorporated; (2) the responsibilities of the Naval Ordnance Laboratory and the contractor were clarified; and (3) an advanced development program for an alternate subsystem was formulated.

* The Army's production decision for the Lance missile was modified to provide approval at this time to contract only for long-lead-time items. Final commitment of Lance to production will be withheld until the system, without the nonnuclear warhead, has been type-classified Standard A by the Army. A decision on procuring the nonnuclear warhead was deferred pending a revision of the DCP that adequately presents the nonnuclear issue.

* In its most recent reviews, the DSARC thoroughly discussed the reliability and maintainability, as well as the life-cycle costs, of the systems proposed--the Heavy-Lift Helicopter (HLH), the UTTAS, the ARSV, the Mechanized Infantry Combat Vehicle (MICV), the M60A2 Tank, the CH-53E Helicopter, and the GAU-7/A Caseless Ammunition Gun. In six of these programs, the Services are modifying their requirements and program efforts to improve

operational readiness, availability, and reduce maintenance costs. For the more recent MICV, the Army proposed a program in which, to achieve significant improvements over existing systems, the vehicle's reliability and maintainability are to be emphasized during design.

We are convinced that the Military Departments' participation in the DCP/DSARC process is helping to prevent unnecessary duplication and overlapping of efforts and, at the same time, is increasing interdepartmental cooperation. Moreover, the DCP serves as a "corporate memory" of the rationale behind decisions and the rejection of alternatives, answering for the record many arguments that used to keep recurring during the development process.

As an adjunct to the DCP/DSARC system for improving the management of defense systems acquisition, there are formal management reviews of in-house management structure and procedures, as well as other management aspects of major programs. The reviews conducted by the DSARC are normally held shortly after a program enters full-scale development. In 1971, 12 management reviews were conducted. From those reviews, we find that most programs are being well managed. Here are some examples of actions taken as a result of the reviews:

* In the B-1 review, we found that the program had been restructured to reflect many of the policies advocated by Deputy Secretary Packard in his May 1970 memorandum, with a significant reduction in RDT&E costs.

* The Harpoon review determined that no separate backup seeker program for the missile would be required. The review also showed that the 10-percent cost threshold would not provide adequate management freedom, and it was accordingly changed to 20 percent.

* After the management review of the Navy's AN/BQS-13 DNA sonar program, the Navy was directed to submit a production plan that would show how increased commitments would be paced for reduction of risk. The Navy responded with a plan that considerably expanded the scope of test and evaluation to be performed at sea. Results of this testing will be available for the DSARC to consider in its production decision review.

As you may know, a highlight of 1971 Defense activity was the issuance of DoD Directive 5000.1, entitled "Acquisition of Major Defense Systems," which expanded and formalized Deputy Secretary Packard's decisions and policies aimed toward improving management of systems acquisition. This action was complemented by the cancellation of almost half of the then existing 125 directives and instructions that influenced defense systems acquisition. The policies of the new directive have been disseminated widely through the Military Departments' implementing documents and by means of speeches, symposia, training films, and personal meetings between the Deputy Secretary and the Services' program managers. Specific areas of the RDT&E program in which we have concentrated on improving management have to do with contracting and cost-estimating practices, the quality of our program managers, prototyping to aid decisions, and organization for management of research, development, test and evaluation. In more detail--

* We are lessening risk in programs by basing decisions on demonstration of hardware rather than paper studies and by reducing concurrency of development and production.

* We are improving contracting practices by insistence on achievement rather than schedule as the basis for further commitment of funds,

by matching contract type to the anticipated risk, and by pricing out all proposed contract changes before they are approved.

* An independent parametric cost analysis will be made on each major defense system at the key program decision points. The results of these independent cost estimates will be available for each DSARC review.

* We are raising the quality of program management through more effective selection criteria and better training for program managers. On 17 December 1971, the new Defense Systems Management School graduated a class of 58 students, the first to complete the 19-week course for prospective program managers.

* We are giving greater authority to program managers to match their responsibilities. More officers of general and flag rank are being assigned as program managers; at present, 21 are serving as managers of our 82 largest programs, in contrast to only 12 general and flag officers in the spring of 1971.

* To provide an increase in program continuity, we are extending the tenure of program managers to a term of 3 to 5 years, and keying their rotation to program milestones.

* We are providing greater motivation to program managers. Opportunity for promotion has been improved by making their assignment equivalent to an operational command billet for purposes of career planning.

* In my own office, I have consolidated the management aspects of major R&D programs and made it a principal responsibility of my Deputy for Engineering and Management.

* The Secretary of Defense has established in my office the position of Deputy Director for Test and Evaluation--on which point I will elaborate later in this statement.

In the overall RDT&E program, these management controls and improvements represent a significant step forward. The various documents I described--the DCPs, ACPs and TCPs--force the OSD staff, together with the Services, to consider and concentrate on the overall plans, issues and objectives of each major program as well as general supporting research. DoD Directive 5000.1 makes clear who is responsible for managing specific programs, the Service and OSD staffs and the program managers each having their clear and separate directions, motivations and responsibilities. Admittedly it is difficult to assess progress quantitatively, but I would judge that we are already past the halfway mark in implementing these new management policies.

2.2 New Initiatives

There is always a tendency to routinize development programs by continuing to make existing types of equipment "bigger and better"--hence, more expensive. The RDT&E community does not always adapt readily to significant changes in basic direction and approach, particularly in periods of tight budgets. To counteract this reluctance to make fresh starts, we have instituted a program of new initiatives whose major purpose is to leapfrog past trends and concentrate Service efforts in specific areas of evident deficiency where the greatest payoff is potentially needed and available. The ACPs and net assessments will assist in identifying these areas. By singling out and increasing the funding on specific mission-oriented programs, based on technology available and development efforts already under way, we hope to increase the concentration of

talent and improve the odds of achieving significant gains in the most promising areas.

The following items indicate progress for a few of the major new initiatives instigated with FY '72 funds:

* Inadequacies in our defense-suppression capabilities were indicated, first by our experience in Southeast Asia and subsequently by observation of the Israeli-Egyptian confrontation along the Suez Canal. Dynamic programs instigated by all three Services, using FY '72 emergency funds, are leading to new and significant capabilities.

* Deficiencies in our Navy's antiship capabilities were first highlighted by the Egyptian sinking of the Israeli Eilat. The Navy has aggressively undertaken the development of interim capabilities from the existing Standard missile until the new Harpoon development can be completed.

* The need for a new class of small sea control ships to counter Soviet naval expansion has resulted in a variety of new efforts by the Navy to evolve alternative design vessels. This effort will be extended in FY '73 by the addition of prototype work on V/STOL aircraft for basing on these new types of ships.

* Army experience in Southeast Asia has again demonstrated the need for ordnance which kills the target, both air and ground launched. This produced a new initiative in FY '72 that is exploring the terminal guidance of artillery projectiles and helicopter-launched rockets (Hellfire). It is also resulting in significant progress in laser designators, guided submissiles, and radar correlation seekers. This effort will be expanded in FY '73 to include terminal guidance for naval gun projectiles.

* Extensive Army progress in the development of battlefield sensors, stimulated by their efforts in Southeast Asia, has identified a need for automated equipment for processing, integrating, and displaying this increased flow of nearly real-time sensor data. Through the Army Tactical Data Systems (ARTADS) program, this deficiency shows promise of early and practical solution.

* Inadequacies in our Army and Marine forward-area defense systems have been recognized for some time. This problem is being addressed in another Army new-initiative program and is resulting in a significant product improvement for the Redeye, as well as further exploration of the possibility of improving Chaparral in the near-term future.

* Army experience in Southeast Asia with their aerial scout helicopters has indicated a deficiency in night observation capability. Another Army FY '72 new initiative is investigating methods of adding improved navigation, target acquisition and night vision equipment to the OH-58 and OH-6. Prototypes will be developed this year.

In addition to the continuation and expansion of several of these programs through FY '73, the Services have identified additional areas in which they wish to concentrate additional new initiatives. These include the following:

* The Army will increase its efforts on battlefield electronic countermeasures, cover and deception.

* The Navy will add emphasis to its operational test and evaluation facilities through the dedication of a combatant ship (U.S.S. Hip Pocket) as a test bed for new devices and through the expansion and upgrading of its ASMD (Antiship Missile Defense) test range.

* The Navy will initiate development of a low-cost electronic-warfare (EW) suite designed to meet the EW needs of small ships used in the escort and shore-bombardment role.

* The Navy will undertake to develop superconducting machinery for naval power plants as a means of significantly reducing the size and weight of shipboard propulsion units.

* The Air Force will expand their current defense-suppression work.

* The Air Force will increase their focus on needed improvements in reliability and survivability of our early warning and attack assessment systems, a key element in the overall command and control of our strategic forces.

* The Soviets' increasing air-defense capability in Europe dictates the need for electronic warfare systems designed to permit penetration with minimum losses. This EW program has been accelerated with FY '72 supplemental funds.

2.3 Prototypes

We have identified many areas in which additional emphasis on the use of various kinds of prototypes could accelerate progress towards the development of new levels of technological capability at modest cost. Prototypes cannot become substitutes for getting technically superior military equipment into operational inventory. They can help provide the means. By increasing the emphasis on this approach--

* We hope to reduce the risk of failure in large development programs.

* We hope to make better program decisions based on hardware, hardware milestones, and hardware tests under realistic conditions.

* We hope to innovate and create more visible emphasis on alternatives without dependence on formal "requirements" and without commitments to production.

* We hope to break some of the trends toward constantly increasing cost and sophistication by trying more original approaches--without the stigma of failure if the concept does not work out.

* We hope to raise our confidence in the practical applicability of specific technical innovations at reasonable cost.

* We hope in many cases to be able to extend competitive developments beyond the study and proposal category into demonstration hardware with which both performance and cost promises can be evaluated.

There are almost as many variations in types of prototypes as there are proposed program phases and hardware. Categorization is difficult at best, but we do wish to provide examples of current efforts. In general, prototypes can be broadly categorized as (1) those which precede the decision to go ahead with development of a weapon for the inventory, and (2) those which are used to support subsequent major program decisions after initial go-ahead, DSARC II and III. (See Section 2.1.)

2.3.1 Before First Program Decision: Prototype effort that precedes a decision to go ahead on a major program generally should have one or more of the following characteristics:

* Support or satisfy an anticipated future military need;

* Significantly reduce uncertainties (technological, operational performance, costs, scheduling) in possible future developments;

* Provide novel and feasible operational or technological options;

* Offer the possibility of appreciably lower cost alternatives or techniques than those currently available or programmed;

* Have a reasonable (not assured) chance of success;

* Have a relatively low cost with respect to potential total program cost.

This is the category of prototypes on which Secretary Packard wanted to place emphasis. Examples of existing and planned presystem prototype effort by all Services follow:

(1) Technology Prototypes: Technology prototypes will be used to demonstrate the engineering feasibility and practicality of new technological discoveries which emerge from the knowledge gained through our research and early exploratory efforts. By these "demonstrators," we hope to display potential new capabilities for which no formally documented military requirement or specific system solution yet exists. This category is characterized by many relatively low-cost projects (typically less than $10 million) with high technological risk but potentially high long-range payoff. Illustrative examples are as follows:

* The Army will prototype open-cycle fuel cells, using common fuels as possible silent, high-efficiency, high-reliability replacement for currently troublesome field power generators.

* The Army will fabricate and test helicopter windows made of transparent single-crystal aluminum oxide. This material offers comparable 30-caliber AP bullet protection at one-third the weight of currently used plastic.

* The Navy will prototype a precise timing system that may permit an increase in worldwide precise time positioning using current satellite communications systems. It would be of benefit to various position-sensitive military systems, to the Federal Aviation Agency, and to certain private industries needing precise time synchronization.

* A joint Air Force/NASA program will demonstrate by flight test the aerodynamic benefits of a "supercritical" wing on high-performance aircraft as a means of reducing drag while increasing maneuverability.

* The Air Force will demonstrate the weight savings (about 25 percent) inherent in graphite and boron fiber/epoxy composite materials in the major structural members of the F-5 fuselage and in the adaptor for the OV-1 satellite.

(2) Operational Practicality Prototypes: In this category, we intend to fabricate low-risk test articles in operationally realistic configurations representing possible solutions to known military needs. Through simulated operational testing, we hope to gain an early assessment

of the operational utility of alternative approaches, while providing an early benchmark for accurate cost estimation. These prototypes are characterized by a relatively small number of projects requiring a substantial investment (typically $20 to $200 million) over several years. These prototypes represent a conscious effort to depart from normal trends of "bigger and better"--and more expensive. Some of these prototypes will, we hope, lead eventually into full development and operational inventory.

Current examples are as follows:

* The Army is testing Air Force Hornet missiles from their helicopters to explore the practicality of their Hellfire program.

* The Army plans to fly small, low-cost reconnaissance drones to determine their potential value to forward battlefield commanders.

* The Navy will explore the practicality of sea-basing high-performance V/STOL jet aircraft to determine their potential for fleet defense.

* The Air Force is exploring the lightweight fighter concept to see whether it is possible to reverse current trends toward costlier, more sophisticated air-superiority fighters.

* The Air Force is planning to explore the potential of current STOL technology to their medium-lift transport requirements through one or more competitive prototypes.

Greater emphasis in the foregoing categories of effort will also provide important stimuli and sustenance to our nation's design and basic research teams, all of which constitute the core of our science and technology base.

2.3.2. After First Program Decision: Prototype effort that follows the initial decision to proceed with a "force structure" program is carried on in direct support of the major decisions which follow:

(1) Development Prototypes: Development prototype effort precedes and supports the decision to enter full-scale development. Development prototypes differ from technology and operational practicality prototypes in that military requirements are known to exist and proven, applicable technology also exists. These prototypes enable us to continue to choose the best combinations of technology and the best overall solution in response to the generally defined system requirement. Current examples are as follows:

* The Army will test-fly various major components of their Heavy-Lift Helicopter before proceeding into a full development program.

* The Army will develop and test two alternative helicopter models before selecting a system to produce for their UTTAS requirement.

* The Army will develop prototype components for Hardsite Defense of Minuteman fields as a potentially efficient way of augmenting the Safeguard system.

* New guns for both the Army's Mechanized Infantry Combat Vehicle and the Air Force's A-X close-support aircraft will undergo competitive development and test.

* The Navy will compete engine and guidance subsystems for their Harpoon antiship missile before committing to a production program.

* The Navy is developing competitive guidance components for their Agile air-to-air missile.

* The Air Force will compete SCAD propulsion and electronic components before finalizing the production configuration.

* Two different overland early warning radars will be competitively flight evaluated prior to selection of the Air Force's final AWACS configuration.

(2) Preproduction Prototypes: Prototype effort in this category precedes and functions in support of the production decision. Two objectives may be served by these prototypes.

* To insure that engineering is completed and the system is ready for the production line.

* To insure that production methods, tooling, and procedures are in hand and the production line is ready for the system.

Production prototypes respond to specific military needs in the form of a specific engineering solution and a specific production intent. These prototypes provide the fly-before-buy experience to verify that we have our engineering and production problems in hand and that we can meet the necessary performance levels. Examples of current systems under development that will reduce concurrency in development and production by the use of preproduction prototypes are as follows:

Dragon
Condor
SAM-D
Aegis
B-1
F-15
S-3A
ARSV

2.3.3 R&D Hedges: The FY '73 budget includes several preliminary development items that are based on strategic capabilities we would need if the Soviets are successful in developing adequate countermeasures to our own present capabilities. In an "unlimited" budget, these programs might progress directly into operational inventory, under the assumption of eventual need. In view of the budget constraints and our imperfect vision of future Soviet intentions, we currently plan to undertake these preliminary developments only as hedges against future Soviet technological improvements. Decisions to proceed beyond experimental or development prototype status would be based on hard proof of Soviet developmental success at some future time. We have benefited in the past from a similar approach to programs like Nike X, OTH radar, Agile, and others. Items in this category include the following:

* Safeguard defense of Minuteman is geared to handle midterm estimates of Soviet penetration aids and numbers and accuracy of reentry vehicles. Our Hardsite Defense program is being designed to meet possible growth in the Soviet threat beyond what the basic Safeguard can handle. This year's $80 million funding request allows us to continue with a prototype demonstration program.

* The ULMS program, despite its size and acceleration, is still partly a hedge against likely improvements in Soviet ASW capabilities.

2.4 Improved Test and Evaluation

As U.S. forces become more dependent upon fewer operational weapon systems, the need grows to assure that those procured for inventory will perform as expected under realistic operational conditions. To minimize costly changes and retrofit, we must ascertain whether the systems will be operationally effective and suitable prior to their commitment to heavy production.

Timely and realistic testing by both developing and using agencies is the best tool to assist in meeting both of these objectives.

The Blue Ribbon Defense Panel's report of mid-1970 commented extensively on deficiencies with regard to DoD test and evaluation--particularly operational test and evaluation programs. The Secretary of Defense has directed the accomplishment of a series of remedial actions:

(1) Over a year ago, Secretary Packard directed the establishment of a user-oriented structure in each of the Military Departments, one separate from the development agency, to carry out operational test and evaluation. That structuring has been accomplished.

(2) Shortly thereafter he announced the appointment of a Deputy Director of Defense Research and Engineering to have across-the-board responsibility at OSD level for test and evaluation. He was charged with monitoring all DoD testing and advising the Secretary of Defense as necessary on test and evaluation matters. This organization is now manned and operating effectively.

(3) Later, the Deputy Secretary of Defense issued more detailed instructions that decisions made on all programs, large and small, would be paced in large measure by test and evaluation progress and that an initial operational testing phase would be accomplished prior to production of new systems.

These changes are having a definite and beneficial impact on the major proportion of our weapons-acquisition programs. At each major decision point in the higher cost programs, the DSARC now devotes a significant portion of its consideration to the plans for, and status of, test and evaluation. At the production decision points, the DSARC carefully evaluates the status and results of test and evaluation for each major program under such control. It hears the independent opinion of the Deputy Director (Test and Evaluation) on his assessment of the test program. When the DSARC recommendation is submitted to the Deputy Secretary of Defense, the opinion of the Deputy Director (Test and Evaluation), General Starbird, is given. The Military Departments have issued, or are issuing, the necessary internal instructions to establish procedures by which smaller programs that are not reviewed by DSARC and the Deputy Secretary of Defense will follow similar practices.

The institution of these revised practices will call for substantially increased effort in FY 1973 and later years. The major portion of the costs for development test and evaluation are, of course, carried in the RDT&E appropriation, and I have carefully considered the adequacy of the FY '73 development testing programs. Operational test and evaluation are primarily carried out by operating personnel and units of the Military Services. Funding for these efforts comes largely from the O&M (Operations and Maintenance) and Military Personnel appropriations.

Nevertheless, a sizable increase in the RDT&E appropriation request for FY 1972 is still necessitated by our determination to improve operational test and evaluation (OT&E). Of this increase, $35 million is in the appropriations request of the OSD and the Defense Agencies, and falls into three basic categories:

* Joint and Inter-Service Test and Evaluation: With $3 million authorized in FY '72, an inter-Service weapons test is under way. This test is a two-sided operation to measure the effectiveness and vulnerability of an Air Force aircraft delivering missiles against a maneuvering Army tank unit. In FY '73 we require approximately $14 million to initiate three new joint and inter-Service tests and to complete the evaluation of the weapons tests.

* Improved Operational Test and Evaluation Base: There is a great need to develop basic information and instrumentation to improve our operational test and evaluation. We need to measure more accurately aircraft survivability, bomb-drop accuracy, weapons effectiveness against aircraft, aircraft target acquisition, and countermeasures effectiveness. Approximately $14 million is requested to finance this activity, which is of interest to two or more of the Services.

* Improved OT&E Evaluation Capability: We are asking for approximately $7 million in the OSD budget request to improve the Services' abilities to accomplish independent and unbiased evaluation of their operational tests. In later years, we will expect the Services to request the funds to continue this activity.

In my discussion, I have only covered the amount in the budget requests of the OSD and the Defense Agencies. The Services will address their own related OT&E programs during their testimony. They will cover such items as range improvements, special test facilities, and development of realistic targets.

2.5 Partnership of U.S. and Allies

The growing constraints on U.S. and Allied RDT&E budgets have emphasized the need to explore mutually supporting weapon-systems developments as a means of avoiding duplication. Collectively, our Allies presently spend roughly $3 billion on nonstrategic RDT&E per year. The U.S. spends only slightly more. We estimate that over $1 billion worth of Allied efforts are, to some extent, duplicative of our own. Chart I illustrates the system types being developed by our Allies, along with the R&D funding magnitude in each area.

Since many of our developments are for combat in Europe, it is clear from the chart that such duplication exists and that significant gains might be achieved if current European developments could be made complementary to our own. This goal is certainly consistent with our overall aims of total force planning and assessment.

To address this problem, we have been working intensively with France, Germany, and the United Kingdom, but we have not ignored other Allies with applicable expertise. This effort has involved systems in three categories: (1) similar developments in two or more countries that can meet a common need; (2) developments that can meet other nations' needs in lieu of initiating a new development; and (3) joint development systems. Any candidate considered for U.S. participation also requires a prototype test and evaluation program, as well as the transfer of data and expertise for U.S. production. This will assure that the U.S. retains technological know-how, maintains a favorable balance of payments, sustains industry employment, and remains independent of foreign sources for critically needed hardware.

There are many candidates under scrutiny by both the U.S. and our Allies. Some examples are as follows:

* French Crotale/U.K. Rapier/F.R.G. Roland Systems: These different surface-to-air missile systems are all designed to destroy

low-flying, high-speed aircraft attempting to penetrate forward-area battle zones. The Army completed a successful preliminary test of Crotale last year, and has tentative plans to test Rapier this spring and possibly Roland this fall. Selection of one of these systems would eliminate the need for a U.S. development, enhance NATO standardization, and simplify logistic support. U.S. production of the preferred system would be arranged.

* U.K. Advanced Harrier with Pegasus-15 Engine (AV8-C): The British Air Force and Navy are conducting studies of an advanced V/STOL aircraft based on the Harrier. The U.S. Navy and Marine Corps are also studying similar requirements. We are evaluating a joint U.S./U.K. cost-sharing development effort on an Advanced Harrier/Pegasus-15 versus alternate industry approaches.

Others include--

* U.S. Navy tests of French EXOCET ship-to-ship missile;
* U.S. joint-Service tests of the U.K. MADGE portable instrument landing system;
* the joint U.K.-F.R.G.-Italy NATO 155mm towed howitzer FH-70;
* the Italian Otomat ship-to-ship missiles;
* the U.K.-France WG-13 helicopter for possible application to LAMPS;
* the U.S.-NATO hydrofoil missile fast patrol boat;
* the joint U.S.-F.R.G. radar development;
* work with the F.R.G. toward European testing of remote sensors;
* the joint U.S.-U.K. sonar development for surface ships:
* the joint U.S.-France RAP (Reliable Acoustic Path) sonar development.

Two other advantages could accrue from increased partnership. First, improvements in equipment standardization and savings in logistic support are possible. Second, the existence of a viable foreign alternative to a U.S. development or prototype will tend to increase U.S. competitiveness and place limitations on our development, prototype construction and, eventually, even production costs, which could result in sizable U.S. savings regardless of which system is adopted.

Notwithstanding the theoretical advantages that could result from these international thrusts, we recognize the extreme difficulties that we and our Allies encounter in implementing them--political, military, fiscal, and technical. Only the demonstration of a few successful projects such as the French RATAC radar sets (now in use in Vietnam) and the U.K. Harrier (now in U.S. Marine use) will generate more U.S. and Allied confidence. Once mutual confidence is gained and the program expands, I feel that several hundred million U.S. R&D dollars per year may be saved, in addition to gaining other even more important political and military advantages to the Western Alliance.

As you know, on the other side of the scales, there are a number of areas in which technical complexity or current U.S. technical superiority inhibits European development and wherein Europe may be dependent upon our continued developments. Examples of these include Lance, SAM-D, AWACS, TOW, and Redeye II.

I believe that the evolution of such interdependency in U.S.-Allied RDT&E efforts is a basic element in our goals to strengthen regional balances and support national developments. Secretary Laird has already discussed these aims in his statement on military assistance.

Chart I

EQUIPMENTS

PARTNER	Helos	Light Aircraft	Jet Aircraft	Trucks	Tanks	Tactical Missiles	Tactical Nuclear	Guns and Artillery	Ground Radar	Avionics	ASW Equipment	Computers	Ships	Submarines	Submarine-Launched Missiles	RDT&E BUDGET*(M)
United Kingdom	x	x	x	x	x	x		x	x	x	x	x	x	x	x	$614
France	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	980
Germany		x	x	x	x	x		x	x	x		x	x	x		470
Holland									x	x	x	x	x			12
Italy	x	x	x	x		x		x		x			x	x	x	37
Canada		x							x	x	x		x			130
Japan	x	x	x	x	x	x		x	x	x	x	x	x	x		300
Australia		x		x		x			x		x		x		x	71

TOTAL EQUIVALENT BUDGET $2,614M

*At standard rates of exchange.

3. TACTICAL WARFARE PROGRAMS

3.1 Budget Overview

I would like to begin this section by discussing some of the specifics of the FY '73 RDT&E program, starting with the area of tactical warfare. In the tactical realm, the U.S. (and her Allies) face threats posed by three types of enemy forces: (1) ground forces, (2) air and antiair forces, and (3) naval forces. The tactical warfare R&D program is structured to be responsive to these threats. To that end, a budget of about $3.1 billion is requested for FY '73.

As a concise description of this budget allocation, somewhat less than half of the requested amount will be spent on 10 programs.

The five biggest programs are all directed toward the enemy's air forces. This reflects a major effort on our part to counter that threat. However, we have not neglected programs to counter the naval and land forces threat. Many of our programs in these areas do not require funding large enough to put them on a top 10 list.

3.2 Response to the Threat from Enemy Ground Forces

U.S. weapon developments are oriented primarily to the threat represented by Soviet and other Warsaw Pact forces. In aggregate numbers, Warsaw Pact forces have numerical advantages in troops, tanks, artillery, tactical aircraft, and air defense weapons over U.S.-NATO forces. Warsaw Pact advantages in mobilization and reinforcing capability accentuate their numerical superiorities.

To offset the numerical advantages of the U.S.S.R. and the Warsaw Pact nations, we have undertaken tactical systems developments in the following areas:

- Battlefield surveillance and communications
- Close combat
- Fire support
- Logistics

3.2.1 Battlefield Surveillance and Communications: Primary problems continue to be locating and tracking the movements of enemy forces, rapid and precise detection and location of enemy batteries when firing, the high risk associated with using manned aircraft to collect this information in the presence of a severe air defense capability, and being able to quickly communicate information between the various elements, commanders and services that typically participate in joint force operations.

To illustrate our programs to improve our battlefield surveillance capabilities, we are proceeding with:

* Field demonstrations in Europe this spring of unattended ground sensor systems to facilitate changes in doctrine and improvements to hardware that are necessary before our sensors, which were very successful in Southeast Asia, can be introduced successfully into other areas;

* Developing prototypes of small, remotely piloted vehicles that can survive the intense defenses of a European conflict and supply near real-time intelligence, thereby reducing risks to manned aircraft and crews; and

* Development of a countermortar radar to replace one that proved unsuccessful in Vietnam and a mobile counterbattery radar that can quickly and accurately locate firing enemy weapons.

The ability of joint forces to communicate among themselves and with their commanders is mandatory for success in combat. Our communications equipment does not necessarily permit communications between the participants in joint operations, for example, between tank and aircraft crews and their respective commanders. This problem, called "interoperability," is addressed under a management organization called TRI-TAC, whose objectives are to ensure a high degree of commonality among tactical communications systems and to achieve economy through joint-Service use. The budget request includes funds for this project.

3.2.2 Close Combat: Close combat refers to those infantry and armor units that close with and directly engage the enemy. Our problem is one of numbers: Warsaw Pact forces exceed NATO forces in number of men, have almost three times as many tanks, and have a considerably higher ratio of armored personnel carriers for their infantry. Moreover, the Soviet tank-modernization program could permit complete replacement of their forces in 12-year cycles. This situation requires that we and our NATO Allies upgrade our capability and rely on qualitative superiority to offset the Warsaw Pact forces' numerical superiority insofar as possible.

To fulfill this, our plans are to develop and field, by around 1980, three new combat vehicles. This budget request supports--

* Continuing competitive prototype development, started in FY '72, of the Armored Reconnaissance Scout Vehicle (ARSV) as a replacement for the M-114. The ARSV will obtain battlefield intelligence and defend against the

possibility of surprise attack. The ARSV is necessary because the M-114, used in the scout role since 1962, has inadequate cross-country mobility, durability, and reliability. The requested funds will support development of competitive tracked and wheeled vehicle prototypes to select, by test, the best design for the scout mission.

* Continuing full-scale development, initiated in FY '72, of the Mechanized Infantry Combat Vehicle (MICV) to provide the level of mobility, firepower and armor protection required to enable it to function effectively with tanks in combined-arms operations. The MICV will replace the M-113 armored personnel carrier, which has been in service since 1959. In FY '73, $10.8 million is requested to continue MICV development.

* Completion of the competitive prototype (shoot-off) of Bushmaster, a high-velocity automatic cannon, as the main armament for MICV and a contender as the main armament for ARSV. Funding of $5.6 million is requested for this program.

* A tank program, including prototypes, utilizing MBT-70 and XM-803 experience for a new main battle tank, and a component development program to improve the M60A1. Tanks continue to be important because there is no known substitute for them for overrunning enemy defenses and exploiting breakthroughs. The new tank prototype program will stress high-payoff features, simplicity of design, and modest acquisition cost. Solutions to previously encountered technical problems of the M60A2 were proven by extensive tests prior to the recent decision to retrofit the entire inventory of 540 M60A2 Shillelagh-equipped tanks to augment the near-term capability of our tank forces.

3.2.3 Fire Support: Fire support includes artillery, armed helicopters, close air support, and tactical SSMs. These systems exist primarily to support infantry and armor which directly engage the enemy in close combat. Recent and current developments in fire support promise such dramatic increases in effectiveness that the conduct of conventional warfare may be radically altered.

The problems we have had to contend with include the following:

* Reliance on massive applications of firepower to compensate for inaccurate delivery and limited effectiveness;

* The near-prohibitive difficulty of defeating hard-point targets and moving targets with artillery;

* Delivery systems which usually provided warning to the enemy and allowed him to disperse or take cover; and

* Slow, close-in aircraft delivery, generally requiring repeated passes that entailed large risks to enemy air defenses.

To increase our viability against numerically superior forces, we are developing a variety of systems which will reduce these long-standing deficiencies and bring entirely new capabilities into being. Guided weap-

ons are being emphasized not only in the terminal-homing new initiative, for which funds are requested, but in a number of other programs such as:

* The TV-guided Maverick, which is now in production, which will permit standoff launch and leave delivery with high accuracy under limited ceilings;

* Development of a laser-guided Maverick;

* The wire-guided TOW missile to provide armed helicopters with an antiarmor capability, and the follow-on Hellfire missile, now entering development, for greater range and reduced exposure time; and

* Cannon-launched guided projectiles that may revolutionize the role of artillery by permitting high first-round kill probabilities even against moving hard targets.

Aircraft are indispensable in defending a broad front against numerically superior forces. They permit the massing of defensive firepower at points where the enemy attacks.

* Flyoff competition of the A-X close support aircraft and competitive ground firing evaluation of its 30mm gun will take place this year. The antiarmor capability of the A-X afforded by its 30mm gun, its ability to deliver Maverick, and the aircraft handling qualities should result in a very effective weapon specifically designed to support ground forces. This year's request contains $48.1 million for completion of the competitive prototype phase of the A-X program and for initiation of engineering development, if warranted.

* Attack helicopters: The Cheyenne is undergoing extensive tests with the improved rotor control system and with the various weapons it can deliver. Funding of $53.6 million is requested to complete Cheyenne development, including the advanced mechanical control system, and to obtain three preproduction prototypes. A production decision on Cheyenne has been deferred pending completion of additional tests and evaluation of alternatives. Army flight tests of Blackhawk and King Cobra prototypes will be included in this evaluation.

Historically, mines have been a major cause of casualties on the battlefield, and nowhere has this been more true than in Southeast Asia. Major emphasis is on scatterable-mine programs, which provide both air and artillery with entirely new capabilities, to place mines under adverse weather and visibility.

For the automated Tactical Fire Direction System (TACFIRE), which will increase effectiveness and responsiveness of field artillery, funding of $5.3 million will complete development, including a rigorous service test. In a related ground system program, two prototypes of a missile fire distribution system (the AN/TSQ-73) will commence engineering tests during FY '73. Interoperability with other control systems is a paramount feature and will provide the Army air defense commander, for the first time, overall display and data.

3.2.4 Logistics: Many tactical operations depend on the ability to rapidly move combat and supporting forces and their necessary equipment. Further, the ability to redeploy our forces to any required location becomes more important as the size of our force decreases. We have under-

taken several programs to improve our capability in this area. These are as follows:

* The Utility Tactical Transport Aircraft System (UTTAS), which will replace the UH-1 helicopter. Based on Southeast Asia experience and progress in technology, the UTTAS will remove deficiencies in the UH-1, such as unsatisfactory reliability and maintainability, short-lived components and marginal standards on safety, crash safety and survivability. RFPs for a competitive prototype development involving two contractors were issued in FY '72 and will lead to a fly-off competition in 1975. When UTTAS enters service in 1978, the UH-1 will have been operational nearly 20 years. Funding required to support this is $64.0 million.

* The Heavy-Lift Helicopter (HLH) will provide a capability to lift logistic containers and tactical equipment weighing in excess of 20 tons. The HLH program is structured to provide this capability while minimizing design risk. Components will be demonstrated in flying prototypes prior to engineering development. The HLH will more than double our current lift capability of about 10 tons. While the Soviet MIL-12 helicopter can lift 44 tons, a world record, we currently see little advantage in a helicopter larger than the HLH until we would be able or prepared to enter into a program to lift our main battle tanks (about 55 tons); $53 million is requested for this program.

* A growth version of the CH-53 which could provide an increased lift capability for the Marine Corps. This program is required because the HLH could not be designed to be compatible with amphibious carriers without seriously reducing its performance. A prototype demonstration of such a helicopter has been undertaken and $10 million is requested for that purpose. If successful, it could lead to a subsequent development and an operational system in 4 or 5 years.

* A prototype program to develop and test two medium STOL transports has been initiated. This aircraft could replace the C-130, which has performed well since its introduction in the 1950s but is deficient in its capability to operate from short and rough fields and in its productivity. Two contractors will provide two prototypes each for competitive testing.

3.3 Response to the Threat from Enemy Air and Antiair Forces

In the past, the Soviet Union has used "air power" to project influences and control. The invasion of Czechoslovakia featured an air umbrella strong in mobility, air superiority and electronic countermeasures (ECM). The strong Egyptian defense depends on a mix of Soviet SAMs, air defense artillery, and fighters. Our experiences over North Vietnam center about North Vietnamese fighter aircraft, SAMs and air defense artillery, although we found a measure of success against these threats.

Overall, the relative air strengths of the U.S. and the U.S.S.R. are in delicate balance. However, we believe the U.S. is about to regain

the initiative through disciplined application of superior technology. The specific steps being taken to that end are discussed below.

3.3.1 Tactical Air Command, Control and Communications: The Airborne Warning and Control System (AWACS) is being developed to fill two Air Force missions--the CONUS air defense role and the Tactical Air Command role. Because our ground radar surveillance systems have limited capability to detect a low-altitude attack, there is a requirement for an airborne look-down radar that can detect intruders and command weapon systems to intercept an attack. Representing the initial U.S. airborne automatic overland radar surveillance and detection capability, AWACS should be able to observe, through heavy ground or sea clutter, any intrusion at any altitude into its surveillance volume. The competitive prototype concept is being applied in the present feasibility program with two competitive candidate radars. FY '73 funding requested is $160 million. Fly-off to determine the winning radar will occur this year.

Early warning is receiving emphasis. The carrier-based E-2A and B, first procured in FY '59, experienced high avionics failure rates and marginal radar performance, and were performance limited to overwater surveillance. The E-2C, an improved version, will provide increased systems reliability and maintainability over previous models. In addition, the E-2C will have detection, tracking and intercept capability over land which will extend command and control functions to overland missions. Production is under way.

The C3 function (command, control and communications) is at the heart of combat effectiveness. Operational experience in Southeast Asia (SEA) led the DoD to the conclusion that automatic, real-time tactical air data-processing equipment that could automatically exchange tactical data with other systems in a joint combat environment was an absolute necessity. The JCS have been directed to require the Services to participate in a program to achieve the required interoperability and to establish a standard for tactical C3 systems. This program is TACS/TADS. A joint management and test team has been established. Testing of interoperability is planned to begin in 1973.

3.3.2 Air Superiority: Our objective in the air-superiority mission area is to enable defeat of Soviet aircraft by providing--

* aircraft that are effective against the Soviet threat;

* aircraft of low unit cost that may be procured in quantity and assist our Allies;

* more capable weapons (missiles and cannon).

Because the Soviets continue to improve the quality of their latest aircraft, such as Flogger and Fishbed, and are broadening and improving their air-to-air missile capability, our program of response is broad and comprehensive.

The budget request supports development of several aircraft systems. These include the following:

* The F-14/Phoenix system, which provides for the first time the ability to fire and simultaneously guide multiple missiles against targets ranging from low-altitude cruise missiles to high-altitude aircraft. This system, now flying. will provide a dominant fleet air defense capability. In FY '73, $162 million is requested to lead to an operational

capability in 1973 and to begin replacement of the F-4 series which entered service in 1960.

* The F-15 system, which, because of its thrust-to-weight ratio, maneuverability, handling qualities, armament, and visibility, is designed to be superior to present and projected enemy fighters. FY '73 funding requested is $454.5 million, leading to an operational capability planned for 1975.

* The F-5E International Fighter is to be suited to the needs of Allies capable of maintaining only simple aircraft systems. Together with the Lightweight Fighter, it will provide aircraft that can support the Nixon Doctrine and will have better foreign sales potential. First flight of the F-5E is scheduled for September 1972. The FY '73 request for support of this program is $17.7 million.

* The Lightweight Fighter prototype, which is a point design optimized for the classical dogfight and could be a valuable adjunct to the F-15. This program reflects our concern over rising costs of aircraft. Cost savings will be achieved by reducing its radius of action and the sophistication of its avionics/armament complement. We expect to contract with two companies for two flying prototypes each of this clear-day dogfighter aircraft. In FY '73, $46 million is requested to support these plans.

* The prototyping concept will be applied to the aircraft for the Navy's Sea Control Ship.

With regard to the objective of providing better ordnance, our plan for air-to-air missile development was determined in the latter part of 1970 by the Ad Hoc Working Group on Air-to-Air Missiles. We are tracking that plan.

Our missile-improvement programs will keep us ahead of the Soviet Union. Cost and reliability will be monitored closely throughout development.

3.3.3 Deep Strike/Interdiction: This area pertains to the delivery of air-to-ground ordnance against enemy targets generally away from the immediate vicinity of the forward battle area. Typical targets include airfields, surface-to-surface missile sites, stockpile sites, and transportation networks and equipment. Particularly troublesome targets are the aircraft shelters.

Two problems in target location can best be treated if we consider the situation in three parts: clear day weather; clear night weather; and day or night adverse weather.

Under clear day conditions at the target, our ability to find and successfully strike targets, using terminally guided weapons, is quite good. Under night visual conditions, the problem becomes more difficult. It is harder to locate the targets, and our selection of weapons is limited. Certain weapons, however, can be used just as effectively as during daylight, provided that we are able to locate the target. With regard to finding targets under night visual conditions, the technology developed for the gunships in Southeast Asia is serving us well. Since small targets are difficult to see, especially at night, cueing sensors are useful. The specific aircraft programs in this area are the Navy A-6E and A-7E. The Air Force will prototype a night attack version as a basis for future decisions regarding the proper sensor combinations.

Under adverse weather conditions, day or night, our capabilities are restricted, except on the open ocean. We can find enemy ships at sea, using radar as the prime sensor, and will be able to destroy them, even in adverse weather.

Last, we have under development several special-purpose air-to-ground munitions responsive to unique enemy target characteristics. In each case, we are pursuing the technology that is required to match the target type.

The advent of more accurate and sophisticated weapons and delivery systems requires that we improve our position-fixing, navigational, and reconnaissance capabilities. In the reconnaissance area, emphasis is being placed on defenses and on information-processing and interpretation techniques to allow rapid exploitation of data.

3.3.4 Defense Suppression: The Soviet buildup in surface-to-air missiles (SAMs) and air defense artillery (ADA) in all parts of the world has been most comprehensive in quantity and quality. We have identified several different SAM systems, a variety of ADA systems, and interceptor aircraft. Some (or all) of these systems can be encountered in any likely theater of operations--Europe, Asia, or the Middle East.

Defense suppression constitutes a consolidated approach covering all efforts designed to detect, identify, locate, confuse, deceive, suppress, and destroy enemy ground-based air defense systems. These efforts support the air-superiority and deep-strike/interdiction missions as well as close-air-support missions. An Area Coordinating Paper for Defense Suppression has been completed and is providing overall guidance for management of efforts in this area and specific program direction to the Services.

You will recall that, about a year and a half ago, the DoD began a concerted high-priority effort and then initiated a number of defense-suppression projects using FY '71 Emergency Funds. These projects were continued into FY '72. Of the five armament projects started, four are showing great progress and one was stopped. These programs were undertaken to determine the feasibility of standoff weapons (other than ARM) against air defense systems such as those in Europe and Egypt. We are now following through with a request of $20 million. A new program, Precision Emitter Location System (PELS), is to provide an integrated standoff defense-suppression system.

To jam and degrade the air defenses we cannot now destroy, a "tactical jamming mix" of complementary systems will be developed. To protect attack aircraft, we shall provide onboard jammers; to counter enemy acquisition and intercept control (EW/GCI) radars, support jammers, escort jammers, and expendables are used. The F-4D will use existing jammers now entering the operational force. An additional $18 million will be provided to prototype and flight-test expendable radar jammers.

The Soviets' radar-controlled 23mm gun threatens Army helicopter operations near the forward edge of the battlefield. The Army is planning prototype development of a helicopter-launched missile in order to combat this threat. A similar concept may be applicable also to Navy ship defense. Further, the Army plans to equip helicopters with radar warning receivers to alert pilots of the presence of radar-controlled weapons.

3.3.5 Field Army Air Defense: The Warsaw Pact's tactical air threat to NATO consists of some 2,400 fighters, whose primary mission is air superiority and protection of ground forces, and attack and reconnaissance

aircraft. Large numbers of fighter aircraft exist in China (over 3,000) and in North Korea (over 500). The Soviets are deploying new air-to-surface missiles, new ground support aircraft with higher speed and maneuverability, and are expected to improve their capability to attack ground forces.

The enemy aircraft projected for the 1980s could reduce the effectiveness of our current SAM air defense systems. The Nike Hercules and Hawk basic designs date from the 1950s, and are marginal when engaging the current enemy aircraft.

The F-15 will greatly assist in countering the increased capabilities of the air threat, but a complementary mix of manned interceptor and ground-based air defense requires an aggressive SAM development program.

SAM-D, with the capability to engage targets simultaneously and operate in an intense ECM environment, will replace both Nike Hercules and Improved Hawk. This system is designed to minimize manpower and maintenance requirements. Engineering development requires FY '73 funding.

To improve our low-altitude air defense systems, we plan to enter engineering development in FY '72 on a replacement for the Redeye missile. The FY '73 budget contains a $20 million request for its development and flight test.

Improvements to the Chaparral and Vulcan low-altitude air defense systems, were funded in FY '72, and $7.0 million of FY '73 funds is required to complete testing.

There is activity in evaluation and test of various foreign air defense systems including Crotale, Rapier and Roland. These are discussed in Section 2.5.

3.3.6 Targets for Antiair Weapons: High-speed, full-scale maneuvering targets are required to evaluate, and to train personnel for, our new antiair systems. The maximum capability available is represented by the subsonic droned T-33 trainer aircraft, whose maneuver capability is limited to slow turns, pull-ups and diving, and whose IR and radar signatures are representative of aircraft technology two decades old. This deficiency compromises the test programs of major antiair weapons. An F-4B drone program is under way and will provide good test support when control capabilities are extended to all-attitude maneuvering. An FY '72 new start will provide all-attitude control to a lightweight fighter-type target (e.g., F-86A, F-102A or F-8). These capabilities will be available for testing the F-14 and F-15 and their missile complements in dogfight conditions. Stress is on design of targets and equipment for multi-Service use and to support testing of surface-based air defense systems as well as aircraft. FY '73 funding of about $17.1 million is requested to support the target development effort.

3.4 Response to the Threat from Enemy Naval Forces (Air, Surface and Subsurface)

Soviet naval units continue to increase their level of activity worldwide. Their surface and subsurface forces are supported by long-range aviation and shore-based systems, all with a missile threat to the fleet. Soviet submarine forces were augmented in 1971 by eight additional Y-class SLBM submarines, additional C-class cruise missile units, more V-class attack submarines, and the deployment of cruise missile submarines; this expansion and modernization, which began in 1967, is expected to continue.

I believe that our deficiencies are in the numbers of our attack submarines and in antiship missiles. I shall discuss more specifically these and other problem areas and our efforts to meet the threat.

3.4.1 Fleet Command, Control, and Communications: Satellite communications have the ability to greatly improve the long-distance communications of mobile users, which today have to rely on the very unreliable HF radio communications. Last year, the DoD approved the development and deployment of a new satellite communications system to support the communications needs of shipborne and airborne users. The system is called FLEETSAT. Initial launch is scheduled for late 1974.

Effective response to the Soviet submarine threat requires reliable tactical communications between our attack submarines and surface and airborne ASW forces. FLEETSAT will represent a major step forward in communicating with submerged vehicles.

3.4.2 Ocean Surveillance (Undersea): A major potential deficiency in undersea surveillance arises from the Soviets' reduction in submarines' radiated-noise levels, which makes their submarines more difficult to locate and track.

To put this entire activity in perspective, an Area Coordination Paper on Undersea Surveillance has been completed. This document, in conjunction with several DCPs and PMs now in process, provides a coordinated development structure for undersea surveillance efforts.

3.4.3 Ocean Surveillance (Surface): The Soviet emphasis on antiship missiles and the increasing forward deployment of Soviet ships armed with these missiles threaten our ships and increase the need for tactical surface ocean surveillance.

In order to provide an improved capability in the near term we have initiated a program to combine an existing airframe with several existing sensors. We plan tests of a prototype later this year. Because of the importance of this program, we are applying FY 1972 emergency funds and have requested FY 1972 supplemental funds.

In FY 1973, we are asking for additional funds for surface ocean surveillance R&D.

3.4.4 Antisubmarine Warfare (ASW): Antisubmarine warfare is critically dependent upon the results of the ocean surveillance (undersea) systems to locate enemy submarines. In addition to the problems of Soviet submarine proliferation and Soviet quieting programs that complicate detection and location, other submarine characteristics present new threats. These include greater missile range, increased speed and depth capability of all classes, and probable improvement in electronic systems.

The U.S. conducts ASW with a mix of weapons--fixed- and rotary- wing aircraft, surface ships and attack submarines. The threat from the newer Soviet submarines requires improved coordination of these ASW forces, especially with submerged submarines. I have already mentioned our efforts in this area.

We are completing development of the fixed-wing S-3A aircraft to give aircraft carriers improved ASW capability now limited to large shore-based aircraft, and will continue work on systems for the LAMPS helicopters to increase the ASW capabilities of destroyer-type ships. Primary effort will be for the near- and long-term improvement of sonobuoys, both active and passive, and of LAMPS sensor equipment.

To improve our underwater platforms and their weapons, we need to continue development of sonar for the SSN-688 and to correct remaining deficiencies in the Mk 48 ASW torpedo. This past year saw the selection of a single Mk 48 model for production after a thorough evaluation of two competing prototypes. That approach clearly demonstrated that competition can result in minimizing program procurement costs.

Mines provide a major ASW potential. Engineering development continues to complete the Captor homing mine, which carries a Mk 46 torpedo. This will provide a new dimension to mine warfare. We also are continuing development of the Quick Strike mine and of techniques to remotely activate and deactivate mines.

3.4.5 Fleet Offense: In order to deter an enemy from warfare in which he can make use of his increasing capability, we need to ensure a capability to attack his forces. We cannot expect defenses alone to deter a potential enemy from action.

An important part of improving our offensive capability continues in the development of the Harpoon air- and surface-launched antiship missile. FY '73 funding is requested.

In order to provide capability to the fleet, while waiting for Harpoon, a new initiative of last year was the rapid introduction of improvements through the Interim Antiship Missile program. The semiactive homing Standard missile, although horizon limited, is appearing in some ships; in addition, we are proceeding with missile modifications to extend effective range. Successful flight tests of the system have been conducted. We have decided to acquire some of the French EXOCET missiles for evaluation and development of improved countermeasures for our antiship missile systems.

SSNs represent another part of our offensive capability, enhanced this year by the introduction of the Mk 48 torpedo. Further improvement of SSN antiship capability will entail a two-phased program for development of an antiship missile. The effort will provide this capability to certain existing submarines, paralleled by a longer term program to provide a system optimized to the threat of the 1980s and 1990s. Harpoon technology will be exploited to obtain the earliest possible capability.

In an era of increasing ship construction cost and decreasing numbers of ships in the fleet, it is critical that we vigorously explore ship designs that may permit increased performance at reduced cost. One such area is the prototyping effort for a Surface Effects Ship (SES), which can sustain speed two to three times higher than conventional hulls.

Two different designs of already built 100-ton SESs are being tested as a part of the design program for multi-thousand-ton prototypes, which in time may revolutionize sea warfare. Funds requested in FY '73 to this end amount to $50 million. This program is expected to continue through FY '77 at an approximate average level of $80 million per year.

3.4.6 Fleet Air Defense: Our fleet remains vulnerable to attack with missiles launched from aircraft, ships and surface craft, and even from submerged submarines. To counter this increasing threat, we are working to improve the coordination of the elements of air defense, as well as improving those individual elements.

Fleet air defense is structured to be defense in depth and embraces aircraft, surface-to-air missiles and gun systems.

Our defense begins at very long range with satellite and aircraft surveillance in order to get maximum warning before an enemy approaches.

We are working toward making the task of locating high-value ships at sea more difficult.

When an air battle is joined, our long-range defense will employ the F-14/Phoenix system (discussed in Section 3.3.2).

The major area defense system in development remains Aegis. FY '73 funding will complete fabrication of its first engineering prototype, which will then be used to conduct extensive at-sea system tests, including the live firing of missiles.

For very close-range defense against cruise missiles, we are developing the Vulcan/Phalanx system. This novel, high-rate-of-fire gun system is progressing rapidly, and will be at sea by next year. It represents a rapid exploitation of a technical breakthrough. This new initiative of two years ago has been tested in the field throughout its development.

Efforts continue in the area of passive defense using electronic warfare techniques. Accomplishments this year will include--

* Completion of operational testing and modification of the antiship missile defense electronic warfare suite for CVAs and DLGs, Shortstop.

* Initiation of a lower cost EW suite for smaller ships.

With improved long-range surveillance to prevent surprise, area weapon systems to break up coordinated attacks, point defense weapons to intercept attacking aircraft and missiles, and a combination of close-in weapons and EW techniques to provide very rapidly reacting defense against any elements of a saturation-level attack that may break through, major improvements in our fleet air defense posture are now in sight.

4. STRATEGIC PROGRAMS

4.1 Impact of Enemy Threat and Diplomatic Negotiations

The objective of our strategic R&D program is to insure that our strategic forces continue to be of sufficient quality and quantity to provide deterrence of any nuclear attack on the United States or our Allies. Our intention is to provide realistic weapon systems that are relatively insensitive to likely enemy developments. Our forces should not only possess the capability, survivability and reliability needed to perform their mission, but they should endure a rapidly changing U.S. or Soviet technology.

4.1.1 The Enemy Threat: The increasing number of Soviet ICBMs, their great throw weight and potential accuracy, directly threaten our current ICBMs. Soviet submarine-launched ballistic missiles (SLBMs) that are now stationed off our coasts directly threaten our strategic aircraft at their coastal bases, and the formidable Soviet air defenses would make it increasingly difficult for our bombers to reach their targets. We see a lot of Soviet R&D effort going into antisubmarine warfare. Although we cannot identify today any developments that indicate a Soviet threat to our sea-based missile deterrent, we must admit that the Soviet ASW effort is growing rapidly, our knowledge of the details is scanty, and consequently long-range predictions are uncertain.

4.1.2 Recent Soviet Developments: During this past year, the Soviets have continued to increase the number and improve the capability of their strategic forces. Although currently we have an advantage in

submarine-based missiles, the U.S.S.R. is rapidly closing that gap with an acceleration of its already energetic submarine construction program. There are now about 42 SSBNs under construction or in operation. There is evidence of new silo construction in the Soviet Union. Whatever the intended purpose is for these silos, it is evident that such a major system change must be considered as a clear manifestation of the Soviets' resolve to further improve their ICBM force. They continue testing their new swing-wing strategic bombers, called "Backfire." There is additional construction at the Soviet ABM sites that could indicate either a system upgrading or the coming of a new system. In terms of air defense, the Soviets continue to improve their extensive EW/GCI (electronic-warfare/ground-controlled intercept) coverage. Numerous EW/GCI sites are distributed along the borders, in barrier defenses, and around major defended areas. In terms of interceptor aircraft the newer models include the Mach-3-plus Foxbat. Also the Soviets continue to deploy their new low-altitude SA-3 surface-to-air missile.

Before I review our major strategic programs that are designed to cope with the threat, I would like to make some comments with regard to SALT.

4.1.3 Impact of Diplomatic Negotiations: The entire question of strategic force sufficiency is subject to modification, depending on the degree of our success in coming to an agreement on strategic arms limitation with the Soviet Union. According to the nature of the agreement, if any, we may wish to modify our request. Secretary Laird put the general situation in context in his 18 November 1971 speech before the Navy League Council when he said:

> We sincerely hope for convincing progress in SALT. But failing such progress I must tell you that the renewed Soviet strategic weapons momentum may confront us with the need for additional off-setting U.S. actions which I would not hesitate to recommend. I would repeat that we are hopeful for success in the Strategic Arms Limitation Talks now underway in Vienna, but no Secretary of Defense can base his plans and recommendations for adequate national security programs simply on the hopes for success in negotiations.

In line with this reasoning, I believe that it is appropriate to position ourselves to counter threats that are not likely to be limited by a strategic arms agreement and, in addition, to maintain a program that would hedge against the unfortunate event that no agreement is reached.

I will now briefly review the major strategic deficiencies and our plans for correcting them. I would be delighted to discuss in detail any individual items you may wish to consider.

4.2 Warning, Strategic Command and Control

4.2.1 Tactical Warning: Fundamental to the security of the country and the survivability of our forces is our ability to detect missile attacks as rapidly as possible. Last year I reported on the progress of our early warning satellite system. At that time, we had just obtained experimental evidence that our early warning R&D satellite system confirmed the predicted performance and that it would provide us with an excellent ballistic missile warning system. We now have a satellite that is capable of immediately reporting ICBM launches from the Sino-Soviet area. Additional satellites will be deployed to give us more effective warning. This year, our early warning systems will provide coverage of the entire threat area by at least two unique types of sensor.

There are, however, some improvements that must be made. Some of this year's funding request of $43.6 million will be used (1) to develop more survivable warning systems through diversity of sensors so that it will require multiple types of attacks to knock out our warning capability, (2) to provide diverse communication links to improve overall communications availability, (3) to develop radars to augment our SLBM warning capabilities, and (4) to more fully integrate our existing sensors. In addition, the funding will allow studies to determine less costly approaches to satellite warning.

4.2.2 Strategic Command and Control: Strategic command and control systems satisfy two vital roles in our deterrent posture. First, they must be able, even under heavy direct attack, to support Presidential decisions on the use of forces and, with high confidence, communicate those decisions to the forces. Second, they must provide the stability and security that result from confidence that the strategic command and control systems will work.

A major review of strategic command and control systems, conducted during the past year, has concluded that our current strategic command and control posture is inadequate to meet our objectives and that the correction of current deficiencies is of the highest priority. Some of the deficiencies were organizational, and steps have been taken to correct them.

A major new directive has been published to strengthen and centralize the management of strategic command and control, as well as to clarify priority of objectives. Development and management responsibilities that were previously fragmented between the Military Departments and the OSD have been centralized.

In addition to organizational problems, there are critical deficiencies in the capability of the Airborne National Command Post systems and communications capability to support decisions of the National Command Authority (NCA) and their transmission to the forces.

4.2.2.1 Improved Command Posts: The current Airborne National Command Post (ABNCP) system has (1) limited endurance, (2) inadequate staff and decision aids for attack-assessment processing to support the NCA, (3) insufficient confidence in the two-way communication of attack-assessment data (in support of decisions) and in the communication of orders to the forces. To correct these deficiencies, a fleet of 747 jet aircraft for use as new airborne command posts will be acquired; these will replace current EC-135 ABNCPs which now support the National Military Command System and the Strategic Air Command. The new ABNCPs will have much improved communications (using satellites as well as other equipment) and adequate staff, which will very significantly improve the quality of support for decisions by the NCA on the use of forces and the execution of resulting orders. The new ABNCPs will be specifically designed to operate under the effects expected in a nuclear environment, including the electromagnetic pulse (EMP). This capability will be verified by testing facilities. Requested FY '73 funds for the ABNCP are $26 million and for the facilities, $15 million.

4.2.2.2 Survivable Communications: The credibility of our nuclear forces depends in large part on the existence of reliable communications for their command and control. We are therefore developing new communications techniques and systems, among which the principal one is a satellite communications system.

A suitable satellite system will take some time to achieve. For the interim, we are moving to improve our posture by providing redundancy of communications through the use of programmed satellite

resources, such as the Defense Satellite Communication System and the FLEETSAT, by our strategic command posts and forces. In addition, funds are included in the request ($10 million in FY '73) for development of additional communication satellites to further increase redundancy.

The C-130 airborne VLF systems (TACAMO) that are now deployed have insufficient communication range in a nuclear environment. Thus, funds ($14 million in FY '73) are requested for the Sanguine ELF system to enter the validation phase after the expected satisfactory outcome of independent studies on its environmental impact. Sanguine would have the advantage of continuous communication. Alternatives under study include hardened surface systems and deeply buried systems that would be virtually invulnerable. According to DoD studies, both classes would have minimal environmental impact. Cost estimates for the hardened surface systems are from $150 to $500 million, depending on the survivability level chosen. Further R&D is required to remove uncertainties regarding the cost of deep underground systems.

4.3 Strategic Missile Systems

4.3.1 Fleet Ballistic Missile Systems: Because of the Soviets' accelerated buildup of nuclear forces, we need to begin a new system now in order to convince both the Soviets and our Allies that we intend to stay strong. Accordingly, this year's budget request contains funding to accelerate the submarine program for the Undersea Long-Range Missile System (ULMS). We have chosen ULMS because it is currently judged to be the best technical means of increasing our strategic capability.

Before deciding to accelerate ULMS, we considered many alternatives for increasing our sea-based missile capability. We chose to speed up the ULMS program for these reasons:

(1) It provides an early demonstrative signal to the Soviets and our Allies that we are going to remain strong.

(2) It is an already established development program.

(3) It provides the best available hedge against any likely future antisubmarine-warfare (ASW) threat.

(4) Unlike some other alternatives, proceeding with the ULMS program will not temporarily reduce the readiness of our existing SSBN force or adversely affect the construction of ASW submarines.

(5) This submarine design will take full advantage of the latest available technology to reduce its detectability by a full range of sensors.

(6) The ULMS has a built-in growth potential in the size of its missile tubes so that it can carry a more capable missile; this will provide combinations of range and payload.

Although the design of the ULMS submarine is markedly superior to that of our current missile submarines, these subs will become operational at only a moderate rate; it will be a matter of years before we have a substantial fleet of them. Meanwhile, because our current missile submarines must remain a viable force, they are now being upgraded to carry Poseidon missiles. From what we know of Soviet capabilities, this force of ours should be viable for many years if some potential problems are taken into account.

The first problem is the potential threat of an effective Soviet ASW capability. We know that the Soviets devote a significant amount of their

resources to ASW development and exercise. Unfortunately, we are not able to adequately assess the effectiveness of such a capability. Consequently, if we are not to be surprised at some time in the future, we must do with our SLBM force whatever is necessary to make the Soviets' realization of an effective ASW capability much more difficult than it is today.

The second problem is that, owing to the Poseidon missile's range, the current system must rely heavily on overseas bases to maintain its alert rate. Even now, we face some minor problems with our overseas SSBN bases.

In response to these problems, we have incorporated into the ULMS program the development of a new-technology missile called the ULMS-1, which is compatible with the present configuration of Poseidon boats as well as the new ULMS submarine. When our current SSBNs are armed with this more capable missile, the ocean area from which they can launch their missiles will be significantly increased, with no sacrifice in payload. This enlargement of an area in which the Soviets must expand their strategic ASW efforts degrades the effectiveness of any ASW of the kind they now appear to engage in. Consequently, we expect that, with this new missile, the current submarine missile system will remain invulnerable. Moreover, the longer range ULMS-1 missile will offer the option of CONUS basing with minimum sacrifice in deterrent posture.

4.3.2 Land-Based Missiles: I continue to be deeply concerned about the survivability of our land-based missiles that are deployed in fixed silos. Improvements in the accuracy of Soviet missiles are possible and, therefore, could eventually counter any feasible degree of silo hardening. Soviet technological improvement and limitations on defense could seriously jeopardize the survivability--and, therefore, the deterrent effectiveness--of our land-based missile force.

Our current programs--Upgraded Silo Program, improved in-flight hardness and Safeguard--appear to be adequate technical solutions for maintaining the survivability of Minuteman in the face of current estimates of the midterm threat, in which Soviet accuracies are limited. Against the long-term threat, we have two options--Hardsite Defense to strengthen Safeguard and ICBM mobility.

This year's budget request contains funds to continue Hardsite Defense--and I intend to speak of that later. Owing to congressional refusal to support our requests for development of a mobile ICBM option, however, we have not renewed that request this year. I mention it only to point out that we still consider mobility a viable option. Another year we may again request funding to develop a mobile ICBM.

Our RDT&E request of $154.7 million for Minuteman covers continuing the development of the Command Data Buffer and essential work on design, development and test of hardness improvements. The Command Data Buffer will provide a valuable reduction in the time required to retarget Minuteman missiles. The hardness improvements cover both the Upgraded Silo Program and modifications to the Minuteman II and III missiles to improve their hardness during powered flight.

4.4 Strategic Aircraft

We continue to believe in the need for a mix of strategic deterrent weapon systems--including aircraft. Our strategic aircraft must still contend with two urgent problems. The first is the possibility that they may be destroyed while trying to get away from their home fields after being warned of an enemy attack. The second is the need to survive enemy defenses while penetrating to their targets. These problems

(which I shall discuss in order) are called aircraft prelaunch survivability and aircraft penetration.

As I reported last year, one of the more serious considerations in our R&D planning is the potential of Soviet SSBNs to attack some U.S. bases with missile on trajectories that preclude sufficient U.S. warning for our bombers to escape. In view of this potential SLBM threat, we have decided to relocate some alert bomber bases inland farther from the launch points of enemy submarines. We have also initiated improvements of both the bases and the aircraft--extra runways, crew spaces closer to the aircraft, means of more rapidly starting the aircraft's engines, etc. These steps should keep the strategic bombers prelaunch survivability at an acceptable level for the next few years; moreover, they require no RDT&E funding.

Because of their increased number, however, Soviet SLBMs will be able within the next 5 years to launch attacks on our bomber bases. We must therefore develop an aircraft that (1) accelerates faster so that it can clear an attack and (2) is hardened to withstand nuclear effects so that it need not fly so far to escape. The B-1 has been designed to have these features.

With regard to penetration of enemy defenses by strategic aircraft, we are requesting RDT&E funds for several programs to improve those capabilities of the B-52. Funds for other improvements are being requested in the Aircraft Modification accounts. We are asking for a large increase over last year's level for the SCAD program, which I will discuss later in detail. With these improvements, we expect the current B-52 and FB-11 aircraft to be able to penetrate Soviet air defenses, at least through the late 1970s.

4.4.1 B-1 Bomber: For the '80s and beyond, we believe that we may well need a much more capable aircraft. To be prepared for that need, we started the B-1 program in June 1970, and we are requesting $444.5 million in FY '73 to continue that development. I want to emphasize that the B-1 is being designed to cope with a much more severe air-defense situation than the B-52/RV-111 force can handle, even with the modifications now planned for them. For example, the B-1 will fly lower and travel faster than the B-52, but it is being designed to employ the same air-to-surface missiles, SRAM and SCAD. Moreover, the early B-1 avionics will incorporate many of the basic components of the FB-111.

As you know, the B-1 program is based on the fly-before-buy philosophy. One full year of flight testing is planned before a production decision is even scheduled to be considered. Under my Office for Operational Test and Evaluation, we are carefully reviewing the content of the flight-test and ground-test program for the B-1 to be certain that they will provide a proper basis for considering any future decision regarding deployment.

Progress in developing the B-1 has been substantial since my last report to you. Two major milestones in the program, the preliminary design review and the full-scale mockup review, were achieved on schedule.

The money requested for the B-1 in this year's budget will be used for design and development activities prerequisite to completing the design validation and critical design review milestones. At this level of funding, the fabrication of the first air vehicle is expected to be 75-percent complete and the second air vehicle, about 33-percent complete by the end of FY '73.

4.4.2 SCAD (Subsonic Cruise Armed Decoy): The present technique of using low-altitude bombers assisted by electronic countermeasures (ECM), is a reasonably adequate method of penetrating Soviet defenses. If the

Soviet Union should be able to equip the Foxbat interceptors with a look-down, shoot-down capability and also to continue their deployment at the current rate, then the number of potential intercepts of penetrating bombers by Soviet fighters would become unacceptably high. In the event that this threat develops, we would like to assist bomber penetration by using decoys to dilute the Soviet air defenses. Our current decoy for this purpose, the Quail, has a number of deficiencies. To eliminate them, the decoy SCAD is being developed. Its principal purpose is to assist the B-52 force in penetrating area defenses. With appropriate changes, however, it could be used by the B-1 force. SCAD will be a more credible decoy; it has a range of hundreds of miles and a virtually unlimited maneuver capability. Let me assure you that we will design this decoy to accept, with minimum modification, the incorporation of a nuclear warhead and the associated improved guidance and range. The concept under which we have initiated the development of SCAD calls for employing both in-house organizations and associate contractors in much the same manner as our very successful gunship program was conducted. The FY '73 request of $48.6 million for SCAD will support a production option in Calendar Year 1975. If a production option is exercised then, initial operating capability (IOC) will come about 18 months later.

4.5 Defensive Systems

4.5.1 Safeguard: The FY '72 RDT&E program for Safeguard has progressed very satisfactorily with system tests, including intercepts of IRBM and ICBM targets by both Spartan and Sprint missiles under the control of the Missile Site Radar on Meck Island. To develop completely the full capability of the Safeguard system, however, will require increasingly difficult system tests through and beyond FY '73.

In the FY '73 Safeguard program ($340 million for RDT&E) we are requesting (1) continuation of deployment at Grand Forks and Malmstrom and (2) authorization for deployment at Warren and Whiteman in order to protect more of our Minuteman forces. We are also asking for funds for advanced site preparation at the National Command Authority at Washington, D. C., so that later we will be in a position to deploy protection for our command and control functions in that area.

4.5.2 Hardsite Defense: The Hardsite Defense Program has continued on schedule through the stage of contract definition, and the selection of a prime contractor for prototype development is expected in the first half of this calendar year.

I should remind you that Safeguard is being deployed at Minuteman sites to protect against the Soviet ICBM threat as we think it will develop during the mid-1970s. We are continuing work on the Hardsite Defense prototype demonstration so that we can provide additional improved protection for Minuteman, if required, to counter an advanced Soviet threat. This program is being designed to meet possible Soviet threats that may develop later in the period and are too difficult for Safeguard alone to handle. Hardsite Defense involves the use of more interceptors (modified Sprints) and specially designed radars to handle heavier attacks at minimum cost. It can also, however, take advantage of deployed Safeguard radars (the Perimeter Acquisition Radar and the Missile Site Radar) and can thus be effective either in augmenting a Safeguard deployment or in an autonomous mode.

4.5.3. ABMD (Advanced Ballistic Missile Defense): Efforts will continue on the Advanced BMD program leading to technological advances for more effective new systems, or improvements in existing systems, in the face of changing threats. In particular, we plan to devote a major effort

to solving the technological problems connected with area defense. We also plan to push forward with improved data processing, a new solid-state radar, and nonnuclear kill technology.

5. THE TECHNOLOGY BASE

A vigorous and growing research and technology effort is vital to our ability to provide for the nation's security. It is important that I describe this program for you, tell you what we are doing to improve its effectiveness, and outline some of the benefits we are receiving from it.

5.1 What Is the Research and Technology Program?

The research and technology program comprises three main elements. The first is a continuing search for new scientific principles or concepts, which we call research. For example, some years ago it was discovered that energy could be pumped into certain materials and then taken out again in the form of light, which could be sent long distances as an intense, narrow beam. This was the discovery of what we call the laser.

The second element is an exploration of how to apply scientific principles to defense problems, which we call exploratory development. Not every principle has an application, and the application of new principles may not be realized for some time. Continuing with the example of the laser, its availability led eventually to the thought that it might help in one of the oldest and most difficult of military problems--how to guide a wapon to its target. The concept is this: If a beam of light from a laser is directed toward a target and if a weapon that has a sensor which causes the weapon to seek objects that reflect the unique light frequency of the laser is then fired, the weapon should be guided directly to the target. The laser can be pointed by a forward observer in an aircraft, or by a soldier on foot. The weapon itself may be an air-to-ground missile or a ground-based weapon. Obviously, however, there are many problems to be solved before a concept such as this can be made a reliable operational system. We would address these problems of how to apply the laser principle in exploratory development.

Let us say the exploratory development work is successful, and we work out the details of how we might build lasers and sensors to do the job. We still wouldn't know whether all these new components and materials could be put together in subsystems that would operate practically. This feasibility proof of the various parts of a new system is obtained in the third element of our research and technology program, advanced development. If this is successful, the research and technology effort is considered complete. We may or may not continue to develop and procure an operational system in each specific instance, but in any case we have evolved a new, known and proven capability--an option ready to be called up and put into use if needed. In the case of the laser, a positive decision was made to utilize the successfully demonstrated technology, and laser-guided weapons soon entered the inventory.

In summary, then, the three parts of our research and technology effort are as follows:

* Research--the search for new principles that lead to potential capabilities different in kind from anything previously known (funded in the 6.1 budget category).

* Exploratory development--the development of materials and processes and the invention of components and subsystems to

enable new concepts to be applied (funded under the 6.2 budget category).

* Advanced development--the proof that components and subsystems will actually work in the "real world" (funded under the 6.3 budget category).

5.2 Diversity of the Technology Base

Characteristic of the research and technology program are its wide diversity and seeming fragmentation. The program encompasses all the many disciplines that make up science and engineering. It is implemented by about 30 offices and commands in the Department of Defense, and the work is performed in several hundred laboratories throughout the country. At any given time, there are about 19,000 separately identifiable efforts (work units) going on in the program. This would be an impossible situation if it were not for a certain amount of aggregation, organization, coordination, and management. Let me use an example to clarify my meaning.

In the Navy's medical research program on infectious diseases, there are some 600 work units, including a Navy field research unit working on schistosomiasis (snail fever) in Africa and a laboratory group at Bethesda Naval Hospital following a hopeful lead to a vaccine against this disease. The DoD is investigating this disease because it causes more illness in the world than any single infectious disease except malaria, and would be a major problem for our forces if events required their presence in many parts of the world. However, it is not found in the U.S., so it is not part of the research program of the Department of Health, Education and Welfare.

At the first level of aggregation and organization, managers at Bethesda adjust funds and priorities so that the field and laboratory work on schistosomiasis remain in phase. At the U.S. Navy's Bureau of Medicine and Surgery, the next higher level of aggregation and organization, managers adjust funds and priorities so that the work on schistosomiasis is in consonance with other efforts on infectious diseases. At both medical levels there is also coordination with the Army's infectious-disease programs to obviate unnecessary duplication of effort. At still higher Navy levels, there is concern about the emphasis given medical research, compared with that given other areas of research and technology, such as weapons, electronics, and ships.

This multiplicity of activity leads to a markedly dynamic quality in the R&T program. Even in research, which is necessarily the most stable part of the program, there is substantial change. For example, if we compare the FY '66 Air Force research program with the program today, we find that nuclear physics went from 4 percent of the program to zero, atmospheric sciences increased from 14 percent to 24 percent, materials changed from less than 3 percent to more than 11 percent, while general physics and life sciences, each, decreased by almost half. These programs are thus not endlessly supported, but change with changing Service and DoD needs, which is what I want to speak about next.

5.3 Distribution of Effort and Relevance

The total FY '73 funds requested by research (6.1) and exploratory development (6.2) contributions to the research and technology base is $1,497 million. This is distributed as shown in Table 5-1.

Table 5-1. DISTRIBUTION OF BUDGET CATEGORIES 6.1 AND 6.2
(In $ millions)

Department or Agency	Research (6.1)	Exploratory Development (6.2)
Army	89	259
Navy	129	300
Air Force	93	275
ARPA	41	182
DNA	0	129
Total	352	1,145

The research portion is divided by Military Department and scientific area, as shown in Table 5-2. It can be seen that the Army places first priority on biomedicine, the Navy on oceanography, and the Air Force on atmospheric sciences.

Table 5-2. DISTRIBUTION OF MILITARY DEPARTMENTS' RESEARCH EFFORT (6.1)
(In $ millions)

Area	Army	Navy	Air Force
Materials and mechanics	14.7	19.0	19.2
Physics and chemistry	9.4	18.6	16.1
Electronics and energy conversion	10.5	16.9	16.1
Biological and medical sciences	21.1	10.9	1.9
Oceanography	0.0	26.1	0.0
Atmospheric science	4.0	2.9	19.8
Mathematical science	4.6	8.7	6.2
Terrestrial science	3.0	5.6	2.3
Other	9.6	6.1	5.5
Independent Laboratory Directors' Fund	12.1	13.8	5.4
Total	89.0	128.6	92.6

Each Department also places strong emphasis on materials and mechanics, electronics, physics, and chemistry. These priorities are, in fact, in line with the respective needs of the three Military Departments.

The exploratory development programs may be organized into six major areas. The portion of total effort devoted to each area for the three Military Departments is displayed in Table 5-3. Here we find weapons technology the number-one item, with electronics in second priority. The emphasis on weapons is to be expected; and in view of the heavy military requirements for command, control, communication, and surveillance--all of which are entirely dependent on electronic applications--it is not surprising that electronics would run a close second. Inspection of the entire list seems to show a realistic ordering of priorities in view of the problems and needs of the Military Departments and the Department of Defense as a whole.

Table 5-3. DISTRIBUTION OF MILITARY DEPARTMENTS' EXPLORATORY DEVELOPMENT EFFORT
(In $ millions)

Area	Army	Navy	Air Force	Total
Weapons	88	104	50	242
Electronics	47	60	95	202
Air-sea-land vehicles	29	42	62	133
Biomedical sciences	62	21	31	114
Materials and mechanics	15	48	25	88
Environmental sciences	18	25	12	55
Total	259	300	275	834

The 6.1 and 6.2 funding requested for FY '73 represents an overall increase of 6.9 percent, as shown in Table 5-4.

Table 5-4. FUNDING OF 6.1 AND 6.2
(In $ millions)

Category	FY'70	FY'71	FY'72	FY'73
6.1 Research	373	319	332	352
6.2 Exploratory development	873	963	1,068	1,145
Total	1,246	1,282	1,400	1,497
Change from previous year (%)	-1.2	+2.9	+9.2	+6.9

Table 5-4 also shows that in FY '72 we stopped what had been a 7-year decline in the technology base if inflation is considered. In FY '72 and FY '73, we have been attempting to expand the base slightly by correcting for inflation and providing for a little additional effort. Why are we doing this?

The technology base has been under tremendous fiscal pressures since 1965; funding directly needed for the Vietnam war, funding for urgently needed systems development deferred by the Vietnam war, and antipathy and hostility toward "technology" are just a few of these pressures. We have watched the Soviet Union exploit this situation by aggressively pursuing a large military technology effort, about whose possible consequences I have kept you informed. It has seemed to us, within the budgetary and other constraints we face, that the one clear-cut hedge against an unacceptably large divergence in Soviet and U.S. capabilities is the protection and enhancement of our technology base. Accordingly, last year we halted the erosion of the base in terms of funding level, and this year we are again protecting that level. I might point out, however, that our FY '73 level is still slightly less than that of the last prewar year (1964), expressed in current dollars.

It is insufficient, however, to simply protect the level of funding. How well is the expenditure of this large sum of money being handled? How effective and productive are the laboratories and the people who are a part of it? This brings us to our next topic.

5.4 Implementation of the Research and Technology Program

I might digress a moment and say that it is clearly impossible to solve problems of research and technology management solely by centralization. No one person, or small group of people, can have the breadth of

knowledge or the capacity of intellect to assimilate thousands of technical efforts in many scientific disciplines. Quite the reverse, our task is to get the greatest number of creative minds working together on our technological problems. For these reasons, our efforts to improve management have been directed toward increasing the participation of knowledgeable scientists in management at all levels.

There are three aspects of program implementation that I wish to speak about.

5.4.1 Clarification of Responsibilities at the OSD Level: The Blue Ribbon Defense Panel recommended that cognizance of the research and technology program be placed under a single OSD office. This has been done, and the Deputy Director for Research and Advanced Technology in my office has this responsibility. In line with my comment a moment ago on the requirement for decentralization, each Military Department has the clear-cut responsibility to manage its share of the technology base and to direct it toward the support of its own mission. This means that the DD(R&AT) is in no sense a czar over the entire technology base. His function is to encourage and sponsor our technological base and to work with the Military Departments to achieve improvements. As the representative of the Secretary of Defense in the technology area, the DD(R&AT) has appropriate authority. I believe this office is establishing a climate that has been and will be productive in bringing about significant improvements in our management of the technology base.

5.4.2 Technology Coordinating Paper (TCP): As you know from my prior testimony, the TCP is intended to be a document, prepared jointly by knowledgeable people from the ODDR&E and the Military Departments, that assesses the state of a technology area. We have prepared TCPs in the following areas:

- missile propulsion
- medical and life sciences
- materials
- structures
- aircraft propulsion
- aeronautical vehicles
- human resources
- environmental sciences
- electronic devices

In preparing these first TCPs, effort was concentrated on the exploratory development (6.2) activities of the Military Departments. About 70 percent of such activity is already addressed in the aforementioned TCPs. As updated versions of these same TCPs are prepared, additional research and related activities will be brought in. Experience has shown that each TCP greatly improves inter-Service communication in its technology area, provides guidance to the Services in formulating their programs, and establishes a valuable channel between in-house laboratories and policy-making levels.

Let me briefly describe what one of these TCPs contains and its value. I will use the Materials TCP as the example.

The Materials TCP is organized by the military systems each Service will need over the next 10 to 12 years. Each system is factored into its subsystems and components, and a determination is made whether we have adequate materials to fabricate each component. If we do not, then the necessity for a technology program to get such a material is obvious. A series of charts concisely and explicitly relates materials problems to each vehicle, weapon or other system.

The time required to solve the materials problems is also estimated, and the system capabilities achievable under current budgets are projected in time. System capabilities which could be achieved by increased funding are also shown, so that decision makers can know when the materials required for any given system will be available and the extent to which they could shorten time to availability by increasing funds to specific programs.

For example, the TCP showed that about 8 percent of materials effort went to strategic missiles, both offensive and defensive, but that perhaps 20 percent was needed for timely solution of hardening and other problems. We increased some allocations in FY '72 to correct this, and we plan in FY '73 to bring funding in these critical areas to slightly over 20 percent of the materials total.

The TCP is also an effective means to identify duplicative or missing programs and to encourage joint Service endeavor. For example, during the course of writing the Environmental Sciences TCP, a question arose whether climate has sufficient influence on human performance that it should be a factor in military personnel selection/assignment procedures. Inquiry of medical personnel revealed that this was not a programmed area of research. A new initiative to evaluate this matter was included in the Environmental Sciences TCP, and the medical/psychological aspect will be addressed in the first revision of the Medical and Biological Sciences TCP. In another example, as a result of preparing the Missile Propulsion TCP, the Services voluntarily instituted cooperative efforts on six programs totalling several million dollars and implemented $5 million in new initiatives. In general, I believe we've made a good start with TCPs, and I believe there will be many future benefits from them.

5.4.3 In-house Laboratories: There has been much criticism of the DoD in-house laboratories over the years, the most recent being a set of critical comments by the Blue Ribbon Defense Panel. We have been working diligently for the last several years to correct laboratory deficiencies. To see what progress had been made and to identify precisely remaining problems and possible solutions, Mr. Packard asked for a comprehensive survey of the laboratory situation. Two review groups were established, one from the Military Departments and one a group of academic consultants. Using different approaches, these two groups independently arrived at similar conclusions.

The DoD group, in a very detailed study, found much evidence of improvement in the laboratories, and noted especially their responsiveness and productivity. For example, they found that in the past two years the in-house laboratories were responsible for about 1,500 identifiable innovations of major significance to DoD. These were new hardware items or capabilities sufficiently advanced to derive a realistic judgment of their value. They also found that the in-house laboratories had been remarkably responsive to needs related to the war in Vietnam; there were over 500 requests which the in-house laboratories met in less than six months from notification of the need to delivery of hardware.

The findings of the DoD group were generally supported by the independent judgment of the academic group. Although their study was less detailed, this group noted that the laboratories are a valuable resource which maintains a nucleus of expertise for contingencies, responds quickly, and has made many significant contributions.

However, both groups felt the laboratories can be further improved. Particular areas cited for continued attention were: clarification of the role of the laboratories in system acquisition, overmanagement of

laboratories by the Services, and that continuing problem for all institutions--quality of personnel.

I have already mentioned that the TCPs are helping to couple the laboratories to higher management levels, and we are seeking other ways as well. One aspect of overmanagement has been controls on both budget and manpower, with allotments of each not necessarily in consonance. With the support and concurrence of the Office of Management and Budget and the General Accounting Office, we are experimenting in selected laboratories by removing manpower controls and using only fiscal controls. The Directors of these laboratories can then channel all energies to maximizing the return on the dollars invested, a desirable situation often compromised when overlapping controls are imposed. The personnel quality problem is complicated by Civil Service regulations which unduly inhibit a laboratory Director's ability to upgrade the quality of his staff. OSD has made recommendations to the Congress which we feel would alleviate this problem, such as management option retirement, use of quality of performance as a factor in reduction-in-force, and voluntary early retirement. We will continue to work with the Civil Service Commission to press for improvement in these areas.

In short, our laboratories have improved and are still improving. As a result of congressional adjustments in salary schedules, greater inducements to eligible persons to retire, and the current job market, government laboratories are in a competitive position to attract and retain first-class scientists and engineers. We hope to take as much advantage of this situation as the constraining influence of simultaneous personnel strength reductions will allow.

5.5 Evolutionary and Innovative Research and Technology Programs

There are two major types of technology programs in a competitive environment--one can be called evolutionary and the other innovative. The evolutionary programs are done because they must be done even if only to react to competition. They are characterized by low risk and low payoff, and are simply an extrapolation of the current state. Aircraft propulsion technology is an example. This technology has now advanced to a state where big steps, like the one of going from cylinder engines to turbines, is not a likely development. But jet engines are still quite capable of being improved, and if a competitor is making a steady annual improvement, let us say 10 percent in such a technology, then he will double his capability in about 7½ years. If we haven't kept pace, we could be faced with a disastrous disparity. Many of our programs must be thus directed toward making these steady improvements.

The innovative programs are characterized by high risk and high payoff. They don't extrapolate from the current situation; instead, they create a whole new capability all their own. It is through such innovations that we provide alternate futures advantageous to us, and we want to increase the portion of our R&T program devoted to this objective. This, to a large degree, is why the level of the technology base could not be allowed to decrease further. Such decreases would have essentially eliminated any possibility of maintaining viable efforts in the innovative area. To stimulate work in this area, I have called upon the technological community, in both industry and DoD, for new initiatives. Initially, the response has been good, and it will improve. As a result of this effort, we will be including in the technology base a number of new programs which I believe will strengthen our future position.

5.6 An Assessment of the Value of the Technology Base

In my comments so far I have tried to answer some broad questions regarding the technology base. I have described what it is, how the

effort is distributed, how the program is implemented, and how the base serves as a source of evolutionary and innovative work that keeps our technology viable and provides us with future military options. But what of the key question: Is the technology base worth approximately one billion dollars of 6.1 and 6.2 funding each year? There are at least two yardsticks, or criteria, one broad in scope and one detailed, against which we can measure our judgment of this question.

For a broad yardstick I suggest we make a comparison with the value of technology-base activities in the private sector. We note that the Department of Defense spends about 1.2 percent of its annual funds on research and technology programs. These programs address, directly or indirectly, every activity undertaken by the DoD. The end objective is to improve the operations of our armed forces, upgrade the hardware they employ, and reduce the cost of performing essential military tasks. By way of comparison, we note that technology-using private companies in the United States spend from 1 percent to as much as 5 percent of their gross income on research and technology, addressing questions of product improvement and manufacturing cost reductions. Their reason is that, in the competitive market environment in which they live, they have found it economically productive and necessary to do so. By this broad criterion, then--assuming the validity of the comparison and realizing the energetic competition faced by the DoD in its field--we have every reason to believe that a 1.2 percent expenditure on the technology base should be highly cost-effective.

A more detailed assessment of our technology-base expenditures is made by asking what it is we are buying for one billion dollars and then determining whether or not we are getting results that measure up to the price. However, there are two hazards in this type of assessment which I wish to delineate:

(1) Early in my comments on the technology base I mentioned a laser-guided weapon system as a development to illustrate how the concept of the laser came up through research, exploratory development, and advanced development, and then became an integral part of a deployed system. At the point of deployment, of course, we are no longer dealing solely with just the laser concept. Literally hundreds of other technology programs must also have made their contributions in order for the laser to be applied--appropriate materials must be available from which to manufacture the laser, and appropriate sensors must be available that can observe the laser light and transmit the observation to the control systems that cause the weapon to be guided to its target--all these items require many technological contributions. Some of them will be quite old at the time of their incorporation. The point of this is to emphasize that, if we look only at the early results from one or a few of the 19,000 or so work units that make up the technology base, it is not possible to assess their full effects. Only when we look at a completely developed system, with all of its incorporated technological efforts, can we evaluate with some firmness the full consequences of many small technology-base activities.

(2) As I mentioned before in making the private-sector comparison, our technology base work has two broad objectives--to improve military capability and to save costs. What the technology base should do for us in a cost sense is to give us the capability we need at a cost we can afford, thus making the total Defense budget do a great deal more for us than it would have done without technological development. This is our meaning when we say a technological development that costs perhaps $100,000 has effected a savings of, say, $10 million. In reality, we could not have afforded the capability if it cost $10 million more than it did, but the technological advancement made possible the attainment of a capability we did need.

Returning to our detailed assessment, then, the Department of Defense "buys" with its $1-billion technology base expenditure, four principal items:

* A capability to solve, by technical means and on a short time scale, urgent problems encountered by our armed forces.

* A capability to evaluate new defense concepts and to select those of greatest potential value.

* A capability to advance technology across a broad front of military need.

* A capability to provide improvements in the operations of our armed forces that save money or increase personnel effectiveness.

Let us examine some examples from each of these areas.

5.6.1 Problem Solving: Each year problems come up in the armed forces that need direct and rapid solution. Many of them are solved by people at our Defense laboratories, people who receive their principal funding in the 6.1 and 6.2 categories. Let me cite two examples to illustrate this type of product from the technology base.

* A few years ago, in Army training camps such as Fort Ord, California, there were serious outbreaks of meningitis. In terms of total people involved, the number was small, and incidence rate wasn't significantly different from that of the population at large. But it is an extremely serious disease, and it was becoming increasingly resistant to methods of treatment that had worked previously. Using new capabilities for the purification of biological materials, the Army Medical Department in only three years prepared a polysaccharide vaccine for meningitis. This is a very short time for developing a vaccine, and it was made possible partly by other Defense-supported breakthroughs in immunology in prior years. Its worth will be measured in terms of military lives saved, in man-days and hospital costs saved, and in future benefits to the civilian sector when the vaccine becomes generally available.

* The booster rocket motor for the Minuteman missile was found to be suffering from cracks in the propellant charge which occurred after two or three years in the silo. It was believed that these cracks might render the missile inoperable and make it necessary to remove the missile from the silo and replace the first-stage rocket motor. The Air Force Rocket Propulsion Laboratory was called into consultation on the matter. First, it helped verify the degree of cracking that was acceptable. This permitted the retention of most of the motors in a ready-for-use status, at least, temporarily. Then it devised a novel chemical treatment that completely halts the extension of existing cracks and prevents the formation of new ones. When and if necessary, this treatment will be applied to existing and future Minuteman motors. The potential savings over a 10-year period could exceed $150 million. The new chemical treatment also has a potential for doubling the acceptable service life period of other operational missile rocket motors, with further savings of equivalent magnitude.

5.6.2 Evaluating Defense Concepts: There are proposed each year a number of new concepts for more efficient military hardware. These

come from the innovative marriage of many technological developments--and are screened in the technology base for validity by analysis and testing. A few examples follow, showing that the technology base is providing this important product. The worth of these developments, if they reach deployment, would be measured in terms of increased capabilities for our Military Services and savings in men and material. Although it is difficult to quantify this worth, it would be substantial.

* The Army Mass Scatterable Mine concept envisages the rapid establishment of barriers by rocket or artillery delivery of small submunitions fuzed as mines. After a predetermined period of time, these mines will reliably destroy themselves so as not to present a future hazard to our own or friendly personnel. This concept permits the use of mines in offensive as well as defensive operations, greatly reduces the cost of using land-mine barriers, and will not require laborious and dangerous disposal operations.

* The destruction of bridges and similar hard targets by air attack has always been a difficult problem. The Air Force has demonstrated an ingenious concept for an air-launched missile with terminal homing. In a realistic test, just one of these devices demolished a concrete bridge pier. This warhead is a prime candidate for further development, and, if successful, would greatly reduce the number of aircraft sorties required to destroy hard targets.

* Another air-to-surface weapon, demonstrated in December, was a glide bomb with a midcourse data link and electro-optical terminal homing. This weapon has a highly effective standoff distance without paying weight and cost penalties for rocket or another type of propulsion.

* The Air Force has completed an initial study establishing the feasibility and desirability of a Modular Weapons Family. The Modular Weapons Family has the twofold objective of (1) maximizing operational flexibility and minimizing development costs for new air-to-surface guided weapon systems; and (2) maximizing production rates and therefore minimizing production costs for air-to-surface guided weapon systems. Ideally, the intent would be to develop two aerodynamic vehicles, one 500 to 700 pounds and one 2,000 to 2,400 pounds, which will be sectioned into modules for seeker, guidance, control, warhead, and propulsion. These building blocks should enable the assembly of a family of air-to-surface guided weapons with unique characteristics. Further validation of the concept is proceeding.

5.6.3 Providing Advanced Technology: Advanced technology gives us new capabilities--additional options to be employed if advantageous. Some examples of this type of product from the technology base are as follows:

* Army scientists have found that personal armor can be made with new types of pyrex glass bonded to nylon or similar bases. This armor gives 85 to 90 percent of the protection of boron-carbide ceramic armor, but at 10 percent of the cost. This development would give the Army the option of providing armor of only slightly reduced effectiveness to a much broader segment of its forces.

* The work in composite materials could provide horizontal stabilizer skins for the F-14 aircraft that will save 360

pounds per aircraft. This weight saving could then be applied to increased weight in other areas (for example, avionics or weapons) without increasing engine power or accepting performance degradation, or it might be applied to increased range or other performance characteristics. This development is being carefully assessed.

* The F-15 engine will have a greater thrust-to-weight ratio than the F-4 engine. This is an example of a result achieved by many small but steady technological advances. For the F-15 it will make possible performance characteristics much advanced over those of the older aircraft.

* The ULMS missile will use many of the latest accomplishments of exploratory development work in propulsion technology--for example, high-energy propellants, high-strength motor-case materials, more effective insulation, lightweight nozzle design concepts, and lighter thrust-vectoring equipment. These and other approaches to increasing ULMS propulsion performance are all being subjected to advanced development and evaluation prior to their incorporation in accepted motor designs. The adoption of new propulsion technology for ULMS will enable range and payload requirements for the missile to be met, while permitting size to remain within acceptable submarine dimensions. The ULMS missile may be cited as a particularly important case in which the technology base has made available the technology to meet a national strategic need.

* The failure of aircraft and other structures through metal fatigue has led the Military Departments to help develop and mature the science of fracture mechanics. As part of this overall effort, it has been necessary to develop very sensitive acoustic and holographic devices that can "see through" structural materials and detect fine hairline cracks before they propagate into critical regions. Some of the newer devices can detect cracks as small as one-sixteenth of an inch in submarine hulls up to 4 inches thick. In aircraft structural materials, which are proportionately thinner than submarine hulls, cracks and flaws as small as one-ten-thousandth of an inch can be detected. This overall technolgoy area promises to save us millions of dollars in terms of lost military hardware and operational capability.

5.6.4 Providing Operational Improvements: In many cases, operational improvements mean that we can meet new threats without having to build entirely new systems. In other cases, such improvements offer operational economies. Coming from the technology base this last year are these examples:

* The structural members of one of our satellite packages now will be fabricated from boron and graphite composites to provide a structural weight saving of almost 50 percent. Further application of composites to this satellite and its propulsion package should enable the SLV-3 booster to launch 10 of these satellites, compared to the three that can now be sent aloft from one booster. Since booster costs are heavy contributors to total costs, the operational savings are significant.

* The requirement to train personnel in the maintenance and repair of electrical and mechanical equipment is a continuing operational need. As the equipment has become more and more complex, conven-

tional methods of training have been found more and more deficient. Techniques developed by the Air Force which visually depict maintenance and repair operations are now coming to fruition. These techniques have now been used by many U.S. personnel with excellent results. They have also been found effective for South Vietnamese for whom the language barrier can be a severe problem. It was used first on the UH-1 helicopter and later on the C-123, CH47, and C7A aircraft. The Army also has adopted the technique for several ground systems. Its worth: It has been found that training effort can be reduced 60 to 75 percent, spare-parts consumption drastically reduced, and maintenance errors cut to practically zero. It clearly has been a contributing factor in the successful Vietnamization effort.

* Army behavioral scientists studying the problem of target detection with night vision devices have come up with new procedures that produce at least a doubling in target detection capability. The new techniques, which involve the optimal assignment of search sectors, altered methods of search, and target detection training, have yielded this improved capability with no physical change in the viewing devices. In addition, information on optimal instrument settings has extended the time during which soldiers can effectively use the devices from about 30 minutes to approximately 6 hours.

5.7 ARPA and DNA

Although you will be discussing the programs of the Advanced Research Projects Agency and the Defense Nuclear Agency in detail with their respective Directors, these programs are important segments of our overall Defense research and technology base, and I would like to describe them.

5.7.1 The Advanced Research Projects Agency: ARPA is an independent Defense Agency which operates under my guidance. The Secretary of Defense and I depend upon ARPA to explore specific critical, high-risk, high-payoff defense research areas. ARPA coordinates its activities closely with the Military Departments, and many of the projects it begins are subsequently incorporated in their programs. It receives both 6.1 and 6.2 funding. The 6.1 programs, budgeted at about $40 million, include material science, human resources research, and information-processing techniques. ARPA's involvement stresses the cross-Service aspects of these research areas. In the human resources area, for example, the DoD spends $6.5 billion per year in the training of 2 million servicemen in some 2,000 different specialty areas. An improvement of even a few percentage points in these training methods would represent a savings measured in the hundreds of million dollars. Working with the Military Services and the Assistant Secretary (Manpower and Reserve Affairs) ARPA is emphasizing this area of research in 1973, with a long-term goal of achieving a 15 percent improvement in training effectiveness.

The Exploratory Development program, funded at about $186 million, includes efforts in strategic technology, tactical technology, advanced sensors, nuclear-test monitoring, and geographically distributed computer systems. These programs have the goal of answering critical questions concerning technical feasibility and anticipating possible technical surprises that could affect the U.S. strategic and technical posture.

A past example was the development of large phased-array radars for ballistic missile defense which have become major components of the Safeguard system. A current example is ARPA's work in over-the-horizon (OTH) radars, which show promise of increasing warning time for our deterrent forces and improving fleet and CONUS air defense.

Over the years ARPA has developed techniques to monitor nuclear test-ban agreements at increasingly lower levels of detectability. Currently, and

for FY '73, some very promising and highly technical techniques are being developed to monitor and classify Soviet space activities. This work could have a great impact on U.S. space activities related to communications, reconnaissance and surveillance.

5.7.2 The Defense Nuclear Agency: The DNA, funded in the 6.2 budget category, explores technology problems in the nuclear area for the DoD (excluded are problems associated with nuclear weapon design, which are handled by the AEC). In the Nuclear Weapons Effects Program, for example, DNA explores the effects of nuclear explosions on military systems. This is done by exposing weapons, components and materials to such environments in specially designed underground nuclear tests. These tests permit us to define the exact response to such environments and to explore methods of countering effects that would otherwise degrade our systems. DNA has also constructed and begun to operate large simulation machines that can produce some of these environments safely and repetitively in the laboratory. But there is still no satisfactory substitute for what has been successfully done by means of underground nuclear-effects tests in Nevada.

A continuing problem in the nuclear area is the identification of new threats brought on by both increased enemy capability and the complexity of our systems. For example, DNA has been addressing the potential vulnerability of our communication, command and control systems to the electromagnetic pulse that results from high-altitude nuclear detonations. In the coming years, largely with the aid of some of the simulators mentioned earlier, DNA will continue to examine this threat and, if necessary, develop some means to counter any degrading effects. Last, in FY 1973, DNA plans to expand its activities in technology areas crucial to our nuclear deterrent. Work on survivable heat-shield materials and structural techniques for advanced reentry vehicles are examples.

5.8 Other Related Topics

5.8.1 Defense Support of University Research: There is a long history of support of the DoD by universities and colleges in the United States. ROTC training, educational training of members of the Military Services, consulting activities by academic faculty members, and defense-related research is a partial list of such support. The last item, defense research, has been particularly important to the DoD since World War II. University and college effort in this area has been relatively level over the years, but, because these institutions have also increased their support of other government agencies, the percentage of government-sponsored research devoted to defense has dropped off greatly. For example, in 1952 the DoD sponsored $100 million of effort for 73 percent of the total; in 1972 the amount was $205 million, but it represented only 11 percent of the total of government-sponsored work.

Several members of the Senate have recently made known their interest in research programs designed to take advantage of scientific talent at the smaller universities and at some of our colleges. You may recall that in the period 1966-1970 we carried out Project Themis, which was designed to help develop new research centers of excellence at colleges and universities not previously supported by DoD. That program helped develop 108 research centers during its 4-year lifetime. Thirty-eight of these centers, no longer receiving any special funding considerations, are continuing to receive support from our regular defense research programs--in equal and fair competition with the largest of our research-intensive universities.

As a result of Themis and other efforts, the base of university support today is quite broad. For example, the Office of Naval Research alone has research contracts and grants at more than 149 institutions. Realizing there are only about 200 institutions offering doctoral programs in areas of defense interest, it is clear that ONR activities are broadly distributed.

Nevertheless, we are continuing our search for innovative talent, particularly among rapidly developing schools and state colleges that have had little or no participation in defense research. During the last year, a large number of colleges and universities were visited by Defense scientists in order to better acquaint them with our research objectives and interests. I would like to digress here and say that, despite the headlines and campus incidents of the past several years, these scientists have in all cases been received courteously. We intend to continue this visitation program in FY 1973, and fully expect that it will lead to the funding of new research teams having ideas useful to defense.

Although my intent is to address mainly the question of DoD funding distribution in U.S. universities, I will take this opportunity to mention a few of the findings from DoD-sponsored research during 1972. These examples are diverse in nature, and are selected because their contributions to future Department of Defense needs will be significant.

* A fundamentally new way of tagging organic molecules that has been developed at Stanford University offers many of the advantages in chemical analysis formerly found only through the use of radioactive tracers. The new method is a novel adaption of a general technique developed in the 1950s called electron spin resonance. This technique has most recently been turned to the study of the behavior of biologically active molecules in membranes. This work is of great potential application to many problems facing us in the biomedical field.

* Studies of ocean-water temperatures in the North Pacific by the Scripps Oceanographic Institute have revealed the presence of anomalously large pools of warm surface water, some as large as 1,000 kilometers in diameter with temperatures several degrees higher than expected. The heat content of these pools is so high that, through interactions with the atmosphere, the climate of the North American Continent is affected. Although this origin is not known with certainty, more accurate long-range weather forecasts are now possible, and the unusually warm winter we are experiencing in North America this year was predicted because of this finding.

* Two important discoveries at New York University will contribute to the future prevention of serum hepatitus (SH). One discovery has shown that active immunization with boiled serum containing Australia antigen (an antigen associated with SH) gives protection from SH virus infection. The second discovery has shown that it is possible to give passive protection against infection by SH virus by injecting serum fractions rich in antibodies to Australian antigen before challenging with infection of the virus. The significance of these discoveries is the probability that they will enable the development of a practical vaccine to SH.

* The Mathematics Research Center at the University of Wisconsin, working with the Army Coastal Engineering Research Center, developed a mathematical model for predicting erosion and silting of harbors that includes the effects of tidal waves on beaches and harbors. This work is relevant to the design of erosion-resistant underwater structures and to the determination of their best location.

5.8.2 Cooperative Technology Programs with Our Allies: Many of our Allies have independent technology-base programs of high quality. In the aggregate, their programs represent a sizable complement to our own. By

means of several formal treaty organizations and special bilateral or multilateral agreements covering defense technological activities, we are able to explore with them their progress in technological areas of interest to us. The principal treaty organizations are The Technical Cooperation Program (with the U.S., the U.K., Australia, and New Zealand), and several science and technology organizations within NATO. The bilateral arrangements are principally with western European nations, Australia, and Canada.

When, as a result of what we learn in these technology exchanges, we are able to stop or revise projects in our own technology base, it represents a direct saving in our R&D that can then be directed to other areas.

This type of activity can be very important in helping the western nations face the Soviet's technological challenge. It is an activity, however, that uses resources--both manpower and money. We are limiting these activities so that the resources are expended in areas of high potential return to both our Allies and ourselves, and are not wasted on areas of marginal utility.

5.8.3 Technology Transfer to the Civilian Sector: Much has been said in recent years about technological spinoff from defense or space research to the civilian or commercial sector. This transfer can be made in various ways, but it is most effective when the team that has carried out the original development also adapts its work to the new purpose. The DoD has done such work for many years, but a considerably increased interest from other government agencies has been recently observed. There are a number of reasons for this: The breadth of DoD's technical base is one. Another is that, when defense technology is applicable to a civilian problem, the civilian agency has to fund only for the adaptation; it does not have to pay for the independent development of the whole technology. The cost saving can thus be very large.

Some examples of this type of activity are the following:

* Several projects for the Bureau of Mines to substantially improve safety among mine workers.

* Several projects for the Department of Transportation and the Federal Railroad Administration concerning an antiderailment sensor, fire protection for tank cars, and the handling of hazardous materials.

* A project for the FAA in the development of fire-fighting systems for STOL ports applicable to future interurban airports.

* A Bureau of Customs project employing advanced sensor technology to detect small, low-flying aircraft employed in drug-smuggling operations.

These projects are funded by the civilian agency when the project is outside DoD's mission responsibilities or are jointly funded when direct application to a military requirement is also apparent. While this type of activity is not a large endeavor at this time, it is a growing one--in FY 1972, it might run as high as $15 million. I wish to bring this trend to the notice of the Congress because I feel it is a particularly noteworthy example of interagency cooperation, one which clearly makes double use of government funding. I wish also to assure the Congress that the DoD's policy is to limit this type of activity in amount so as not to interfere with the ability of our laboratories to fulfill their chief mission and to limit it in kind so that our laboratories do not undertake investigations that are more properly carried out by private or other governmental laboratories.

5.8.4 The Role of IR&D in the Technology Base: The total of noncontract research and development by the industrial contractors of the DoD during the calendar year 1971 just completed was approximately $700 million. Of this amount, about $300 million was funded by the DoD under the independent research and development (IR&D) program. There are over 100 major industrial participants in the program.

The IR&D funding heavily supports 6.3 and 6.4 systems engineering work undertaken by these industrial contractors, but it has also been one of the more productive national sources of new technical concepts. As these new concepts are originated, they are usually given preliminary investigation and evaluation by their originators, using IR&D support. Those that show promise are then presented to the DoD, which considers them for larger scale R&D support under contract. By this process, the innovative stages of pioneering R&D work receives quick support, relatively unencumbered by paper work and delays. It is widely accepted in knowledgeable technical circles that innovation thrives best in this kind of environment. At the same time, the more expensive aspects of later exploratory, advanced and engineering development have remained subject--as they should be--to the tighter regulations and controls of procurement under contract. In this way, then IR&D serves as an important adjunct to our technology base.

6. BUDGET BREAKOUT

This section contains a breakout of the major items of the FY 1973 RDT&E budget request. The overall distribution of the total effort is shown on Table 6-1. This is followed by a tabular display of the major individual programs exceeding $25 million and an indication of those that have increased or decreased by $10 million or more from the final appropriated FY 1972 RDT&E budget.

You will notice that we have consolidated many program elements this year. We hope that this will not cause too severe an inconvenience to your staffs. It has been done to improve the overall visibility of major budget trends, and is consistent with our policy of decentralizing program detail back to the Services, who bear the responsibility for their detailed content.

The proposed budget level for the technology base is essentially a management judgement concerning needed level of effort. This year's increase will offset anticipated cost-of-living increases and provide a small positive impetus to the overall program. Division of effort within this total is explained in Section 5.

The proposed budget levels for tactical and strategic are determined in an essentially independent manner on the basis of an individual review of each program element. No attempt is made to stabilize any specific funding ratio of one to the other. Together, they represent the major reasons for increasing this year's budget request.

We have made a serious effort to avoid the "forward funding" of programs which we know will run substantially beyond the end of FY '73. Only minimal funds are included for continuity in those important programs whose annual contracts cannot begin and end precisely with the fiscal year. We believe this will help to minimize our past carryover problems.

You will note that we are again requesting an Emergency Fund of $50 million. This fund still represents an exceedingly valuable asset in stimulating rapid response to urgent unforeseen requirements and exploiting unexpected but significant technological advances.

All FY '72 figures shown on the tables reflect the addition of the FY '72 supplemental request and corrections for cost-of-living adjustments.

TABLE 6-1. ESTIMATED DISTRIBUTION OF RDT&E IN THE DEPARTMENT OF DEFENSE
(TOA--in $ millions)

Distribution by:	FY 1971		FY 1972		FY 1973	
DEVELOPMENT						
Research	317.6	4.4	331.4	4.3	351.5	4.1
Exploratory Development	965.2	13.4	1,067.8	13.7	1,145.4	13.4
Advanced Development	1,051.0	14.6	1,502.1	19.3	1,771.0	20.7
Engineering Development	1,411.2	19.6	1,865.8	23.9	2,383.3	27.8
Management Support	1,129.6	15.7	1,057.5	13.6	1,125.9	13.2
Emergency Fund	-	-	50.0	0.6	50.0	0.6
Operational Systems Development	2,314.9	32.3	1,918.0	24.6	1,724.7	20.2
TOTAL	7,189.5	100.0	7,792.6	100.0	8,551.8	100.0
PERFORMER						
Industry	4,408.7	61.3	4,912.5	63.1	5,642.2	66.0
Government In-House	2,392.9	33.3	2,432.5	31.2	2,445.9	28.6
Federal Contract Research Centers	193.9	2.7	201.6	2.6	214.7	2.5
Universities	194.0	2.7	196.0	2.5	199.0	2.3
Emergency Fund	-	-	50.0	0.6	50.0	0.6
TOTAL	7,189.5	100.0	7,792.6	100.0	8,551.8	100.0

Table 6-2. MAJOR FY 1973 RDT&E PROGRAMS
(In $ millions)

A. Army

R&D Category	FY 71	FY 72	FY 73
6.1 Research	76.3	82.2	89.4
6.2 Exploratory Development	211.2	242.7	259.5
6.5 Management & Support	289.0	309.3	303.1

Programs of $25.0 million or more in Categories 6.3, 6.4 and Operational Systems Development:

63203A Heavy-Lift Helicopter
63302A SAM Development (SAM-D)
63304A Advanced BMD
63306A Terminal Homing & Warhead Development
63308A Prototype Hardsite Development
63711A Electronic Warfare
63719A STANO
64206A UTTAS
64602A Weapons and Ammunition
64604A Mobility
12514A Safeguard Defense System
23625A Advanced Aerial Fire-Support System

B. Navy

6.1 Research	114.6	124.9	128.6
6.2 Exploratory Development	239.3	280.2	300.0
6.5 Management & Support	223.9	238.3	250.4

Programs of $25.0 million or more in Categories 6.3, 6.4 and Operational Systems Development:

63359N Antiship Weaponry
63551N Surface Platforms
63558N Reactor Propulsion Plants
63762N U/S Surveillance
64352N S/L Weaponry, Systems Technology
64360N ULMS
24122N F-14 Squadrons
24215N CV ASW Aircraft S3A
24311N Submarines
28014N Underseas Surveillance System
33109N Satellite Communications
34111N Special Activities
63451N Space Technology (Advanced)
63354N Air-to-Air Weapon Technology
64356N AEGIS (Eng)
11315N FBM Command and Control--Communications

C. Air Force

R&D Category	FY 71	FY 72	FY 73
6.1 Research	85.2	87.5	92.8
6.2 Exploratory Development	238.5	255.9	274.8
6.5 Management & Support	594.5	475.6	505.7

Programs of $25 million or more in Categories 6.3, 6.4 and Operational Systems Development:

63225F SCAD
63233F AX
63235F Lightweight Fighter Prototype
63236F Advanced STOL Transport
63311F ABRES
64209F F-15
64215F B-1
64723F Advanced Airborne Command Post
64738F Protective System
64743F Tactical Support Jamming
64744F AWACS
11213F Minuteman
34111F Special Activities

D. Defense Agencies

ARPA			
6.1 Research	41.5	36.8	40.7
6.2 Exploratory Development	167.5	169.4	182.3
6.5 Management and Support	-	3.7	3.7
Defense Nuclear Agency			
6.2 Exploratory Development	108.7	119.6	128.8
Technical Support of OSD/OJCS			
6.5 Management and Support	11.6	17.2	50.1

Table 6-3. FY 1973 RDT&E CHANGES OF $10 MILLION OR MORE OVER FY 1972
(In $ millions)

A. INCREASES

P.E. No.	Title
	Army
63203A	Heavy-Lift Helicopter
63302A	SAM Development (SAM-D)
63308A	Prototype Hardsite Development
64206A	UTTAS
64306A	Man-Portable Air Defense System
64604A	Mobility
23625A	Advanced Aerial Fire-Support System
	Navy
63257N	VSTOL SCS (Prototype-Advanced)
63359N	Antiship Weaponry (Advanced)
63451N	Space Technology (Advanced)
63551N	Surface Platforms (Advanced)
63553N	Surface ASW (Advanced)
63762N	U/S Surveillance (Advanced)
64251N	Aircraft Systems (Eng)
64360N	ULMS (Eng)
11315N	FBM Command and Control--Communications
24122N	F-14 Squadrons
24311N	Submarines
24412N	Destroyers
24614N	Captor
28014N	Underseas Surveillance System
33109N	Satellite Communications
	Air Force
63225F	SCAN
63235F	Lightweight Fighter Prototype
63236F	Advanced STOL Transport
64209F	F-15A
64215F	B-1
64723F	Advanced Airborne Command Post
64742F	Precision Emitter Location System
64743F	Tactical Support Jamming
64744F	AWACS
65802F	AEDC Base Costs
34111F	Special Activities
	Defense Agencies
Technical Support OSD/OJCS	
65804D	Support of Test and Evaluation

B. Decreases

P.E. No.	Title
	Army
64202A	Aircraft Weapons
12514A	Safeguard Defense System
22251A	Division Support Missile Lance
23619A	Main Battle Tank
	Navy
63254N	Air ASW (Advanced)
63255N	Air Electronic Warfare (Advanced)
63655N	Mine Development (Advanced)
64252N	Aircraft Propulsion (Eng)
64356N	Aegis (Eng)
64562N	Sub Tac Warfare System (Eng)
11221N	FBM System
24131N	Early Warning Aircraft Squadrons
24215N	CV ASW Aircraft S-3A
25677N	Air-to-Surface Weaponry (Op Sys)
25685N	Sub Tac Warfare System (Op Sys)
34111N	Special Activities
	Air Force
64220F	EF 111A
01007F	International Fighter
11118F	SRAM
11213F	Minuteman
27129F	F-111
35110F	Satellite Control Facilities
41119F	C-5

TECHNOLOGICAL PARITY OR INFERIORITY OF A FREE SOCIETY VIS-A-VIS AN AUTOCRATIC AND SECRETIVE SOCIETY

Chairman ELLENDER. You may proceed.

Dr. FOSTER. During the past few years, it has appeared that the mood of our country would permit the continued, gradual erosion of our military technological superiority. I am convinced that, from a position of technological parity or inferiority, a free society cannot confidently deter any aggressive tendencies of an autocratic and secretive society. Technical surprise in military weaponry could be extremely dangerous for ourselves and for our allies. We must not permit our Nation to be placed in a position of being caught off guard or unprepared.

INCREASE OVER 1972

We are requesting a Defense R.D.T. & E. budget for fiscal year 1973 which is 10 percent, or about three-quarters of a billion dollars, higher than that appropriated for fiscal year 1972, including the supplemental and cost-of-living adjustments. This represents an important decision by President Nixon and Secretary Laird that, in the interests of national security, we cannot afford the gradual loss of our military and technological and superiority—despite the very real existence of other pressing demands on our limited national resources.

COMPARABILITY PAY INCREASES

Chairman ELLENDER. I notice you refer to adjustments resulting from cost-of-living increases.

That is brought about by salary increases.

Dr. FOSTER. Yes, sir, that is precisely how it is done. The Congress makes adjustments in the Federal pay levels.

Chairman ELLENDER. Proceed.

U.S. STRATEGY OF REALISTIC DETERRENCE

Dr. FOSTER. The Defense R.D.T. & E. community bears the responsibility for assuring the continued adequacy of the military department by which we may uphold this Nation's strategy of realistic deterrence. If the United States is to retain confidence in this strategy and in our future survival, then the retention of technological superiority in our military systems is absolutely necessary. We must recognize that the Soviets seek to achieve that superiority for themselves. If we allow ourselves to lose our edge to them, we will have forfeited our insurance policy on the future—for ourselves and for our allies. Once lost, it could take many years and vast expenditures to restore. In fact, we might not be able to restore it in time to prevent some military or political disaster.

Chairman ELLENDER. Doctor, could you tell us how is it possible under a form of government that we abhor that so many scientists can be produced and their capability be equal to or better than ours?

Dr. FOSTER. Mr. Chairman, it seems to me the answer lies in two areas.

First, the Communist system permits a few people to make a major decision and insist on that decision being carried out. So, if the Soviets

decide to make a major investment in an area, specifically science and engineering, there is no doubt that every effort in the country will be made to see that the decision is executed.

Chairman ELLENDER. I am talking about the individual who must perform that work. I remember, when I first went to Russia, I took the position back in 1955 and 1956 that they had good schools. I was criticized for it. I was asked, "Don't they teach communism in those schools?" I said, "Certainly they teach Marxism, but they use the same methods we do. If one takes a glass of water and asks that it be analyzed, they use the same methods we do. In physics and mathematics, they can't use communistic doctrine there."

Dr. FOSTER. That was my second point, Mr. Chairman. For much of this work, whether or not an individual scientist has a particular ideological preference has little effect on his ability to practice his science. So they turn out scientists who are every bit as good as ours.

Chairman ELLENDER. In 1957, when I came back, after Sputnik was launched, I began to realize that Russia was, in fact, very well advanced in scientific and physical knowledge.

All right, proceed.

EROSION OF U.S. MILITARY TECHNOLOGICAL LEAD THROUGH GREATER COMMITMENT OF RESOURCES BY RUSSIA

Dr. FOSTER. You will recall that last year I urged the Congress and other groups to examine this matter of the technical balance between the United States and the Soviet Union. We have worked extensively throughout the past year to determine and measure Soviet technological progress in the military area. The secrecy surrounding their efforts makes this a very difficult task. However, careful analysis of additional data supports and strengthens our conclusions that the U.S. military technological lead is being eroded because of the greater Soviet commitment of resources.

In the late 1950's, the Soviet leadership established as a national goal the attainment of world leadership in science and technology. It has been restated many times in recent years. It was restated by Premier Kosygin on November 24, 1971. The Soviets are convinced that they have already assumed leadership in some technological areas—and, in some cases, I believe, this is true. They believe they will dominate world science in the 21st century. Their depth of conviction, their steadily increasing devotion of national resources, and their apparent progress toward this goal are the basic reasons for our concern.

RUSSIAN MOTIVATION FOR NATIONAL GOAL OF WORLD LEADERSHIP IN SCIENCE AND TECHNOLOGY

Chairman ELLENDER. Doctor, I notice you mention that the time at which this development really started was in the early 1950's. What do you think caused it?

Dr. FOSTER. I think it was a recognition of the enormous progress that had been made by the United States in the period from the mid-1930's to the end of World War II, the fact that our technological effort had made the United States unquestionably the world power and

that that power was largely the result of an effort in science and technology.

The Soviets, I would suspect, felt that if they were to gain world leadership they would have to make an enormous investment in science and technology.

Chairman ELLENDER. Some of the cause was due to their belief that our country was trying to isolate Russia. You recall that we started to build bases in Japan, Okinawa, in Taiwan, and elsewhere. Do you think that had any effect on accelerating their desire to develop their capabilities in science?

Dr. FOSTER. I think it is pretty clear that, following World War II, the United States' influence spread around the world very, very rapidly, often taking the form of military deployments and in turn could have had that kind of effect on the Soviets.

Chairman ELLENDER. That has been one of my theories.

BUDGETARY RECOGNITION AND ACCEPTANCE OF RUSSIAN CHALLENGE: FUNDING REQUISITE TO MAINTAIN SECURITY

Dr. FOSTER. This year's proposed R.D.T. & E. budget represents a vital step toward U.S. recognition and acceptance of this challenge. Last year's approved budget arrested the downward trend in purchasing power of the several prior years. The increase in this year's request is sufficient to eliminate the remaining apparent divergence in the relative efforts of ourselves and our potential, self-proclaimed adversaries. If granted in full, it will help restore the momentum needed to maintain our security—but it will not, by itself, eliminate the continuing disparity in overall effort which unfortunately will further erode our position in the near future.

QUESTIONS RELEVANT TO CONGRESSIONAL REVIEW OF BUDGET

There has been general agreement between the majority of the Congress and ourselves over the necessity for retaining an adequate level of effectiveness in our military systems. There are, however, valid differences of opinion over the size and composition of the programs needed to achieve it. In this summary portion of my statement, then, I wish to concentrate on six questions clearly relevant to your review of our submission.

How do we propose to implement your fiscal year 1972 guidance?

What progress did we make last year?

What new assessment can we make of the technological intentions and momentum of our most likely adversaries?

What are the deficiencies of greatest importance to our national military posture?

How does our fiscal year 1973 budget reflect our efforts to remove these deficiencies?

What efforts are we making to increase the productivity of our expenditures?

Responses to these questions are amplified in the main sections of my written statement, and they provide a more detailed explanation of our proposed programs.

RESPONSES TO CONGRESSIONAL GUIDANCE

I wish to begin by reviewing briefly our responses to your decisions on the fiscal year 1972 R.D.T. & E. budget request. Valuable guidance is contained in the records of your deliberations, and this budget request responds to that guidance. In accordance with your findings:

We have cut back the personnel ceilings at the "think tanks" for fiscal years 1972 and 1973. We would welcome an opportunity to present to you this spring a plan for the future of each Federal contract research center. These organizations provide support to OSD and the services that is essential.

We believe that there have been, and will continue to be, circumstances within the DOD that justify ad hoc agencies and task groups—as in industry and other branches of the Government. In deference to your wishes, however, the defense special projects group (DSPG) will be disbanded by the end of fiscal year 1972, and the Army will not establish its proposed institute for the individual soldier.

LIGHTWEIGHT FIGHTER AND ADVANCED MEDIUM STOL PROTOTYPES

We are pleased by your basic endorsement of the prototype approach. The lightweight fighter program is getting underway, and two competitive advanced medium STOL transport prototypes will be funded if more than one satisfactory technical approach evolves.

BATTLE TANK DEVELOPMENT

The XM–803 main battle tank development program has been terminated. Instead, the Army will undertake a major product improvement program for the M60A–1 and begin a new competitive prototype effort with fiscal years 1972 and 1973 funds. This may include the testing of selected new development models from other nations, with active participation by several potential U.S. producers.

MOBILE MINUTEMAN

All Air Force work on the mobile Minuteman has been deferred.

2,000-TON SURFACE EFFECTS SHIP

The Navy has slowed design of the 2,000-ton prototype surface effects ship pending the availability of test results on the 100-ton prototypes.

Chairman ELLENDER. You know that they have asked for more money for that ship?

Dr. FOSTER. Yes, sir; for fiscal year 1973.

Chairman ELLENDER. As I recall the Navy is requesting $28 million for the initiation of the 2,000-ton prototype surface effect ship, even though they have not completed the evaluation of the two 100-ton prototypes. Am I correct?

Dr. FOSTER. Yes, Mr. Chairman. The tests are now underway on one craft and are expected to start on the second craft within 90 days. We should be well along with about 6 months of testing on those craft before we will have to commit the major moneys for detailed design of the larger version.

Chairman ELLENDER. It was the view of this committee that no funds should be made available for the 2,000-ton ship program until the completion of the evaluation of the two 100-ton ships. This program originally was to be a joint effort with the Maritime Commission, but the Commission soon lost interest and withdrew from the program. Now the Navy is financing the total program.

I discussed this program with Admiral Zumwalt last week, and he indicated that this type of ship might open the gate to a more effective fleet at less cost. Would you comment on this?

Dr. FOSTER. Certainly, Mr. Chairman. The key, as I see it, has to do with the need to get away from the trend of the last few decades of ships. Our ships have been getting larger, more heavily manned, without being more heavily armed, and are costing much, much more, not only for the ships and their equipment but also for the manning. If we just follow this trend, it will not be many decades before a single ship will begin to consume most of the gross national product. Then it seems that we would be at a dead end. At the same time, these ships are becoming more vulnerable and weapons to attack them are becoming more effective—in particular, cruise missiles.

The objective of a surface effects ship is to get a ship that can be mostly out of the water so that it is less vulnerable to underwater attack, is less easily detected by underwater instruments, but at the same time possesses very high speed—instead of moving at 20 to 30 knots, to be able to move at 50 or 70 knots, perhaps more. Now, that can make a major difference in the ability to detect the ship and the ability to catch the ship.

SHIP TONNAGE

Chairman ELLENDER. Have you any idea from what has been already done as to the size and tonnage of a ship you could build?

Dr. FOSTER. Mr. Chairman, this is a critical question.

Yes, we have an idea, but no, we don't have adequate proof. We know now that we can build them at about 100 tons. We have one, and it is beginning its tests. We think the next reasonable extrapolation is to about 2,000 tons. We do not believe it should go beyond that size at this time, because it would involve a risk that we judge too large. While we might in the future want ships of 20,000 tons or more, we feel at this time 2,000 tons is as far as we can push it on an experimental basis.

ESTIMATED COST OF PROTOTYPES

Chairman ELLENDER. What do you figure the cost would be to make a prototype of, say, 2,000 tons?

Dr. FOSTER. We have some estimates on that, Mr. Chairman.

Chairman ELLENDER. Do you know what the 100-ton ship cost?

Dr. FOSTER. Yes, about $40 million.

Chairman ELLENDER. That included two prototypes?

Dr. FOSTER. Yes, sir.

Senator YOUNG. Could I ask a question at this point?

Chairman ELLENDER. Yes, sir.

HEAVY SEA EFFECT ON SHIP

Senator YOUNG. I would expect you would have some trouble with a ship like this in heavy seas. Would this present a serious problem?

Dr. FOSTER. Senator Young, it presents a great opportunity, because the ship is not as tightly coupled to the surface of the sea as is a conventional hull. That is to say, it can rise over the waves. The problem, however, comes in the event its speed is too high for the state of the sea so that the sea actually hits the bottom surface of the vehicle. That could lead to serious structural deflections. Our experience here is extremely limited. For example, in the hydrofoil craft we were greatly concerned that, should the ship, while riding on foils, be lowered against the waves and the hull actually hit the waves at high speed, the impact might well go beyond what the structure permitted.

This has, in fact, not turned out to be the case. They have flown the hydrofoil at very high speed and when that type of hull hit the peaks of waves, while it is a little hard on the crew, it has not had any adverse effect on the hull.

Now, that is a specially designed hull, of course, for cutting into the water. We are going to have to find out by experience how well a surface effects ship performs when there are similar encounters with the surface of the water.

Senator YOUNG. Could you go crossways with the wind as well as into the wind?

Dr. FOSTER. Yes. You see, there are side runners on the ship. In fact, the problem may be more one of turning. There are side runners to prevent the loss of air out to the sides and there are baffles on the front and back to capture the air in those regions.

I have been thinking about it, worrying mainly about the high-sea-state, high-speed condition, when the bottom of the ship solidly hits the top of a wave, inducing large deflections in the structure.

This, of course, is just the problem that the Navy is giving special attention to.

I think, too, unless we have tried out a large craft moving in the open ocean under heavy conditions, we just won't get design data. The 100-ton program cannot provide the open ocean capability.

MOVEMENT OF LARGE TONNAGES ACROSS OCEAN AT HIGH SPEED

Mr. Chairman, to summarize the point I was making a few moments ago about the application of the ship, one of the most important things we would like to be able to do is move large tonnages across the oceans at very high speed. At the moment it is impossible to ship enough materiel by air; it must go by sea.

As I indicated, when it goes by sea one has to worry about its vulnerability and the rate at which materiel is shipped. If we could use high-speed ships of this type, then we could ship the equipment with much less vulnerability and with greater speed.

That is one advantage.

PREPARATION FOR POSSIBLE EUROPEAN OR ASIAN GROUND WAR

Chairman ELLENDER. Again, you have in mind, I presume, a ground war in Europe or Asia in which we would participate.

Dr. FOSTER. I don't have it in mind, Mr. Chairman.

Chairman ELLENDER. For what else would you have use of it?

Dr. FOSTER. To be prepared for such an eventuality.

Chairman ELLENDER. We seem to be paying a great deal of attention to assisting our allies. We are in lots of trouble now in certain parts of the world, such as in Southeast Asia. If ever a land war comes in Western Europe and we are expected to furnish them with all the materials of war and necessary manpower, we will face great financial problems.

Dr. FOSTER. Mr. Chairman, for whatever level of forces that you feel you might have some day to send abroad, all this program does is provide an opportunity to investigate the possibility of sending them overseas more safely and more rapidly.

ESTIMATED COST OF PROTOTYPES

Chairman ELLENDER. If that 100-ton ship costs as much as $40 million for the two prototypes, what is your estimate of the cost of the 2,000-ton ship?

Dr. FOSTER. The complete program, the prototype, testing, and so on, would run into several hundred million dollars.

Chairman ELLENDER. That would be $200 or $300 million?

Dr. FOSTER. Four or five hundred million dollars.

Chairman ELLENDER. A half billion dollars?

Dr. FOSTER. Yes, sir. We have many billions of dollars worth of ships now. We don't look upon this as a small thing at all, Mr. Chairman. It is an extremely critical experiment in an attempt to determine the future of ships.

RESEARCH TALENT

We will continue to search for innovative, high-quality research talent, particularly among the newer and rapidly developing schools and State universities that have had little or no participation in defense research.

DEEP UNDERGROUND SANGUINE SYSTEM (DUSS)

In accordance with the Nelson amendment, work on the deep underground Sanguine system (DUSS) is being held in abeyance pending the outcome of feasibility studies being conducted by the National Academy of Sciences and the National Academy of Engineering.

1972 AND 1973 UNOBLIGATED CARRYOVERS

Corrective steps have been taken by the OSD's steering group for program implementation execution to reduce the unobligated carryover funds for fiscal years 1972 and 1973 to the practical limit.

GUIDANCE MODIFICATIONS

In the following two areas, we believe it is best to proceed along lines somewhat modified from your guidance:

SUBSONIC CRUISE ARMED DECOY (SCAD)

With regard to the subsonic cruise armed decoy (SCAD), a totally competitive system prototype development does not appear worthwhile. The Air Force will streamline management of the program by

using the approach developed for their very sucessful gunship program, and will competitively develop the propulsion subsystem—which is considered to be a critical aspect of the program. As you know, this approach was discussed with, and agreed to by, staff members of both the Senate and the House Appropriations Committees after completion of the fiscal year 1972 appropriations action and prior to the Air Force's initiation of contractual action on SCAD.

Heavy-Lift Helicopter (HLM)

The Army's heavy-lift helicopter (HLM) development program will meet both their requirements and the Navy's shore-based and/or LHA-based requirements. Major HLH components will be prototyped.

CH–53 Helicopter Improvement

The Navy/Marine requirement for a more capable helicopter to operate from LPH amphibious carriers is for a smaller craft providing about half the payload under comparable operating conditions. It will be met by a separately funded project improvement of the CH–53. One aircraft simply cannot do both jobs.

Mr. Chairman, I now propose to report on the progress made in some of our important R.D.T. & E. projects last year.

1972 HIGHLIGHTS

Because our R. & D. program is so critical to our future security and because these efforts are supported at the expense of other national efforts, our programs deserve and receive intense scrutiny. At times, perhaps, there is a tendency to focus our attention on those few programs within our total effort that have not progressed satisfactorily. I would like to add some perspective by summarizing, by mission area, several of the programs in which we have made substantial development progress within the last year. In addition, at the end of section 1, I have included for your information a list of major new systems and equipments reaching the operational inventory in the past 6 years.

STRATEGIC COMMAND AND CONTROL

[Deleted] warning satellites [deleted]. [Deleted] are reporting non-U.S. missile test launches [deleted].

The first Solrad–10 satellite, launched in July, is now providing real-time monitoring of solar disturbances that affect space communications, navigation, and surveillance systems.

STRATEGIC OFFENSE MISSION AREA

MINUTEMAN III

The Air Force has completed deployment of Minuteman III missiles at Minot, N. Dak., slightly ahead of schedule and well within development program costs. System reliability has been demonstrated to exceed [deleted]. Minuteman III, with the MIRV payload, significantly improves penetration effectiveness, and its design increases its survivability and reliability over those of Minuteman I.

Poseidon Conversion

The seventh FBM submarine has redeployed on schedule after conversion to Poseidon. Total development-program costs are still within 5 percent of initial 1966 estimates. [Deleted.]

SRAM Missile

The supersonic [deleted] missile SRAM will enter service [deleted], having successfully completed its development flight-test program on schedule. SRAM will enable these bombers to attack terminally defended targets so that the bombers themselves will not have to penetrate those defenses.

B–1 Aircraft

The full-scale B–1 mockup and preliminary design reviews have established the acceptability of the basic aircraft design. Meanwhile, the B–1 engine has been assembled and is beginning to accumulate test hours. [Deleted.] The B–1 program maintains our strategic options over the next few years.

STRATEGIC DEFENSE

SAFEGUARD

In January 1971, the nearly simultaneous launching of two Spartan interceptors demonstrated the ability of the Safeguard radar and data processors to guide both interceptors—one to a live target reentry vehicle, the other to a specific point in space.

In June 1971, the software package associated with the Safeguard missile site radar data processor was tested. This demonstrated the capability to detect, verify, acquire, and track a simulated ICBM target.

Test of Spartan Warhead

In November 1971, the Cannikin underground test successfully demonstrated the adequacy of the [deleted] Spartan warhead.

The second ABM test phase [deleted] began in the fall of 1971. Most of these tests will use more complex intercept geometries. [Deleted] tests have been conducted, and all have been successful. [Deleted.]

[Deleted.] The success of this test program is unequaled by any other recent program.

[Deleted.]

Construction at Grand Forks and Malmstrom

Construction at Grand Forks is now about 80 percent complete and 5 to 10 percent complete at Malmstrom after a labor problem delayed construction there for 11 months.

U.S. Economic Capability

Senator Symington. Dr. Foster, I would make a comment. You talk about the guidance of this committee for your activities. As I remember it, for R. & D. you were allotted last year $7.5 billion. The request

was around $7.9 billion. This year you are asking for $8.5 billion; correct?

Dr. FOSTER. That is correct, sir.

Senator SYMINGTON. So you have not been guided by the idea of the committee that we should reduce our research and development funds because of the financial position in which this country now finds itself; correct?

Dr. FOSTER. Sir, the guidance was given with respect to specific programs. I do not believe the committee gave guidance that the Department was to come before the committee with a budget smaller than the one that was given to us in fiscal 1972.

PROGRAM HISTORY

Senator SYMINGTON. We are now in the Safeguard system discussion. As everybody knows, I opposed the system when it was called Sentinel because I did not think we should concentrate on worrying about the Chinese. Apparently we do less of that now than before.

Then the name of the system was changed from Sentinel to Safeguard and the mission from Area Defense to Point Defense.

However, the radars were not changed. After this development, one of the foremost witnesses before the committee was Dr. Wolstetter. He was strong for the new Safeguard.

REPORT OF OPERATIONS RESEARCH SOCIETY OF AMERICA AND LETTERS OF SENATORS SYMINGTON, COOPER, AND HART

After decision was made to go ahead, a report came out from an organization called ORSA. What do those initials stand for?

Dr. FOSTER. Operations Research Society of America.

Senator SYMINGTON. It was critical of the integrity of some of the witnesses; whether, in effect, they were sincere in their criticism. So, Senator Cooper, Senator Hart, and I wrote everybody involved, including you, and asked for your opinion about those hearings.

NEWSPAPER ARTICLE

I was interested to note in the press the following:

Major blunder fouled ABM net, A-expert says.

A major blunder has saddled the Nation with a cobbled up antiballistic missile system, according to a top Government nuclear scientist.

Dr. Harold Agnew, one of the developers of the atomic bomb and director of the Los Alamos Scientific Laboratory since last summer, criticized the ABM defense system in a letter to three Senators yesterday.

The cold facts are that for reasons I won't attempt to explain and probably couldn't anyway, our scientific leaders made a very bad blunder some years ago and have been redoubling their efforts through every means possible to make their decision appear to be correct.

COST OF BASES AND RELIANCE ON PROGRAM FOR ASSISTANCE IN SALT CONSIDERATION

To me this is important. I am one who feels our resources are limited. Already the cost of these four bases is estimated to be well over $8 billion.

We have had various reasons for going ahead. One, it would be instrumental in the SALT talks. In the last year I have been to Vienna

twice, and can't understand that line of reasoning. It would appear to be an effort to spend a lot of money on a program which, in turn, appears fundamentally unsound.

The worst aspect is that much of what the Army, Navy, Air Force, and Marine Corps really do need is going down the drain because of the gigantic cost of this modern technological Maginot line. In any case I was surprised to read in the paper this criticism by one of the foremost former supporters of the system, and would like your comments.

Differentiation of Sentinel and Safeguard Programs

Dr. Foster. Senator Symington, first of all, you indicated that the mission had changed in going from Sentinel to Safeguard. I cannot share that view. It seems to me that there were changes but that these changes were not of mission but of emphasis and detail in deployment. Specifically, the Sentinel, as announced by Secretary McNamara on September 18, 1967, was to provide protection against the Chinese People's Republic and protection against accidents—both of which we get from the area mode—and, finally, protection of the Minuteman should the SS–9 force continue to grow (and it was not expected at that time to grow).

President Nixon, when he reviewed the system, decided to move the sites away from the cities and to change the number of sites, and so on. Then he announced that the Safeguard system was to provide protection against a light attack that could be launched by the Chinese, provide protection for the National Command Authority, provide protection against accidents, and provide protection for Minuteman should the Soviet ICBM force continue to grow.

I think by and large the mission is substantially the same, though the emphasis needed on one aspect or another changes as the threat changes.

Complicated Technical, Military and Political Judgments on Decision To Deploy

Now, the decision to deploy this system and the decision on its nature are not simply technical matters. The technical people have not been the ultimate authority in deciding the nature of Safeguard. It is a complicated set of technical, military, and political judgments that must be made.

I realize with regard to Dr. Agnew that from the beginning he did not take the view that the threat from mainland China was serious.

Now, that is not a scientific judgment. Nevertheless, he is perfectly free to make it. On that basis, he sees no need to deploy an area defense.

Now, assuming that one does not have to deploy an area defense, then many of the features of the Safeguard system are not needed. That is how I assume he gets to his conclusion.

If I accept his premises, I am in complete agreement with him. However, I am not in a position to do that. I have to include the military and political considerations. Those considerations have been debated in full by the Department of Defense and the White House and the rest of the Government. With the decision that the President reached. we have a different set of objectives from those that Dr. Agnew would pursue.

LETTER OF DR. WOLFGANG PANOFSKY

Senator SYMINGTON. I would read also into the record a statement by Dr. Wolfgang Panofsky—no one is more highly thought of in this field. He works with the Pentagon and is one of the advisers in the SALT talks.

Dr. Panofsky says in a letter to Senators Cooper and Hart and myself:

To be blunt I consider the type of appraisal undertaken by the ORSA subcommittee as an outrageous practice to be sponsored, even indirectly, by a professional society. I feel that more valid complaints about the professional standards of those preparing the document can be made than the report does about those it purports to investigate. However, this is not the main point. A more valid question is whether a specialized professional society should take it upon itself to analyze a controversy involving views in which many disciplines—physical sciences, operations research, social sciences, computer science, and many branches of engineering—are clearly involved. We are dealing with a subject where judgment based on technical knowledge and experience, rather than pedantic calculations based on ill-founded assumptions, are frequently most essential.

My most severe criticism is that the report deals only with the less important part of the ABM question: That is, how to forecast the prospective threat to the U.S. Minuteman deterrent. By their very nature such projections are subject to great uncertainty since neither technical performance, strategic intent, nor rate of buildup of Soviet weaponry can be predicted with confidence. The much more important question is whether the Safeguard system can deal with the threat, should it continue to evolve; it is this point which drew most of the valid criticism. The Safeguard system even if it performs fully as specified, can deal only with a very narrow band of threats. The ORSA Report does not deal with this much more basic question at all; it is that problem which has to be faced by the Congress in deciding whether the Safeguard system is a justifiable investment for the shrinking defense dollar.

This is the point that worries me the most.

I consider the ORSA Report to be an unfortunate precedent in that it might be interpreted as a mechanism of intimidating witnesses requested to testify before the Congress; I am glad, therefore, that you are giving it some critical attention. I am attaching to this letter answers to your specific questions.

WOLFGANG K. H. PANOFSKY.

POSSIBLE INTIMIDATION OF WITNESSES

Of the people who have preceded you in this position, one is president of Cal Tech and one is or was chancellor of UCLA. The annual budget for the University of California is $960 million; and $438 million, or over half, comes from the Federal Government. Under these circumstances, you can say when there is a weapons system you all want, the scientists involved come here to Washington and protect your meal ticket. It is unfortunate and I want the record to so show, that scientists who felt, knowing of our limited resources, there were more important places to put this money, are now being attacked from the standpoint of their integrity. The idea of intimidating people who come before the Congress—as Dr. Panofsky says, this might be considered to be that effort—is a serious matter indeed. If you all are going to utilize the heavy amount of money that goes into research and development, billions upon billions of dollars a year, to get a slanted story, perhaps it would be better for the National Science Foundation to handle all research and development instead of the Department of Defense.

What are your thoughts about Dr. Panofsky's worry that this might be construed as an intimidation of congressional witnesses who are

not involved with the Pentagon, or who on any basis give their objective judgment?

Dr. FOSTER. To be quite honest about it, Senator Symington, I feel it is essential that the Congress have an opportunity to invite witnesses to testify and that the witnesses should not feel that they are going to be under any great pressure.

Now, I realize we can quote historical examples where pressure was put on the witnesses, and I think that is most unfortunate.

In this case, I did not feel that the ORSA study would put much pressure on these people. I have not gone into it personally, because it seemed to me that this was an opportunity for professionals in the field to deal with ORSA in their own way.

The fact that I was mentioned in it seemed to me not a sufficient reason for my becoming involved. But I share some of Professor Panofsky's concerns.

I also think, however, that every one of us, when we make statements about the effectiveness of a system and support it or not, frequently mixes in a fair amount of political and military judgment. I think it is a very difficult job for the Congress to pull together, in the case of our program, the technical, military, and political factors, and reach a decision.

I have tried to keep my comments on the technical side, and I know others have.

OPINION OF NEW YORK ECONOMIST THAT DOLLAR MUST BE DEVALUED: DEFENSE PROGRAM SELECTION

Senator SYMINGTON. I read only one letter. Many other experts feel the same way.

Thank you, Mr. Chairman.

DISAGREEMENT AMONG SCIENTISTS AND OTHER PROFESSIONALS

Senator YOUNG. I share Senator Symington's concern over the differences of opinion expressed by scientists. Of course, this is not really a new problem with Congress. If you are dealing with farm legislation, all the farm leaders never agree. Even the Supreme Court cannot agree on some provisions of the Constitution that have been there for a couple of hundred years.

It does present a very difficult situation for us.

From my limited knowledge so far, I think I would prefer to go ahead with the ULMS rather than with the ABM. I may be wrong. It is something I am considering. I will have to rely on the judgment of the witnesses who appear here.

ESPOUSAL OF CAUSES BY SCIENTISTS WHOSE OPINIONS ARE POLITICALLY BASED: CONGRESSIONAL SIFTING OF EVIDENCE

Senator SYMINGTON. I would only say to my able friend from North Dakota that it was resented not only by the scientists who were attacked directly, those who testified at the request of Congress, but also by some of their colleagues who were not criticized directly. The latter thought this was an attack on their integrity and credibility as scientific people. That is the reason I brought it up.

Senator ALLOTT. Mr. Chairman, if I may remark on that. I got into the discussion to a degree. I don't know how many times I have listened to scientists before this committee and before other committees who came to testify. They come with long dossiers of their professional capabilities, but ended by making their decisions on political grounds.

Yet, we are all in the same boat. There is not a scientist that I know of in the Senate. Maybe I have overlooked someone's qualities that I don't know about. I don't mean to. We have to depend on other people. I don't know how many times I have had scientific types before us—either in one or another of the fields of physics particularly—who came to espouse or oppose a certain cause and ended with the statement that posed their decision on the basis of political judgment.

Now, Dr. Foster has referred to this obliquely at least, and I think that what we have to do is to try to separate these people as the court does when a man comes before it and qualifies himself, for example, as a nuclear physicist. In such a case he is not permitted in court to base his judgment and his opinions on his qualifications as a sociologist.

STATEMENT OF DR. HAROLD AGNEW

Senator SYMINGTON. I am sorry the Senator was late. I read a statement by Dr. Harold Agnew, one of the leading proponents of the Safeguard system, which stated:

> The cold facts are that for reasons I will not attempt to explain and probably couldn't anyway, our scientific leaders made a very bad blunder some years ago and have been redoubling their efforts through every means possible to make their decision appear to be correct.

I might add, in all sincerity, having been in on these discussions many times before in the Armed Services Committee, that in general the technical people opposed were opposed to the system because they did not think it would work; whereas, many witnesses who were proponents were proponents because they feared Soviet and Chinese communism, which in itself did not seem to me to enter into the technical argument.

Mr. Chairman, that is all I have to say on it.

Chairman ELLENDER. Proceed.

TECHNICAL OPINIONS

Dr. FOSTER. Mr. Chairman, I am sorry, but I can't agree at all with that statement that the technical people opposed the ABM. The technical people did not oppose it. They were split on the matter.

Senator SYMINGTON. I said the technical people who did oppose it opposed it on the grounds it would not work. Many of the people who were witnesses for it did not defend it from a technical standpoint, rather because of their fear of Soviet and Chinese communism.

Dr. FOSTER. I am afraid, Senator, that is granting a fair amount of judgment on how you separate out motives.

Senator SYMINGTON. I suggest you read the testimony of Mr. Paul Nitze before the committee. He is not a scientist any more than I am and was one of the most ardent supporters. He is also an adviser at SALT. His testimony had a great deal to do with the dangers from the Russians and the Chinese. People who opposed it opposed it primarily for five reasons. First, they did not think it would work.

Second, they thought it could be easily saturated.

Dr. O'Neill, one of the chief proponents, agreed that the approximate number of Spartans and Sprints could be released to the American people without affecting national security. Unfortunately, you yourself did not agree and refused to do so.

The third reason for opposition was that it embraced a Maginot Line concept, something unique in the attitude of the U.S. Government in connection with how to defend itself.

Fourth was high cost, and the fifth was that the program was an increase in the arms race.

Chairman ELLENDER. All right.

You may proceed.

I am glad I voted against it.

Senator SYMINGTON. So am I.

Chairman ELLENDER. It is a waste of money.

TACTICAL WARFARE

EA–6B Electronic Countermeasures Aircraft

Dr. FOSTER. In the tactical air warfare area, Mr. Chairman, the Navy's EA–6B electronic countermeasures aircraft has successfully entered final operational evaluation prior to joining operational units. The EA–6B is an important high-power jammer augmentation of our attack forces to insure low attrition rates.

A–7D Attack Aircraft

The Air Force's A–7D attack aircraft achieved initial operational capability in March 1971, exceeding goals for system performance, weapon-delivery accuracy, reliability, and maintainability.

Maverick Electro-Optical Missile

Initial production of the Maverick electro-optical air-to-surface missile has been authorized, based on successful completion of all fly-before-buy requirements in June 1971. Air Force category II testing was terminated early, owing to the high success rate. This system, with its terminal guidance, will provide improved standoff capability against hard point targets.

Chairman ELLENDER. Have all three of these you have mentioned gone through the engineering development stage?

Dr. FOSTER. Yes, sir; they have.

Chairman ELLENDER. They have been sufficiently tested so that you can go into production and place them in inventory?

Dr. FOSTER. That is correct.

Chairman ELLENDER. Proceed.

All-Weather Bombing Direction Radar (TPQ–27)

Dr. FOSTER. The joint Marine/Air Force all-weather bombing direction radar (TPQ–27) has almost finished engineering development—within costs and only slightly behind schedule. This mobile radar equipment provides all-weather, [deleted] bombing in support of combat forces.

CONDOR MISSILE

The Navy's Condor standoff air-to-surface missile completed its initial flight demonstration in 1971, [deleted]. The Condor missile provides the United States a long-range "launch-and-leave" standoff weapon to be used against high-value targets. [Deleted.]

F–14 AIRCRAFT

The Navy's F–14 flight-test program progressed satisfactorily during the year; the first preliminary evaluation by Navy pilots was successful. Its performance was considered outstanding, and some maneuver requirements were exceeded, according to Navy reports. The F–14 will provide the Navy with a sorely needed new fighter [deleted].

Chairman ELLENDER. As I recall, you discuss the F–14 in detail later in your statement.

Dr. FOSTER. That is correct, Mr. Chairman.

Chairman ELLENDER. Please proceed.

VTOL HARRIER AIRCRAFT

Dr. FOSTER. Operational tests of the Marines' VTOL Harrier are proceeding very well, and are demonstrating the versatility of this aircraft in support of amphibious operations.

JOINT SERVICE INFLIGHT TRANSMISSION SYSTEM (JIFDATS)

Then, the Point Services In-Flight Data Transmission System (JIFDATS) has completed engineering development and entered flight evaluation in an RF–4C. JIFDATS provides faster video transmission of imagery information to a ground processing facility from airborne sensor systems.

F–15 AIRCRAFT 25MM INTERNAL GUN AND ENGINE

The competitive prototype "shoot off" of the F–15's 25-mm. internal gun has been completed on schedule and within cost thresholds. The F–15 gun has the maximum rate of fire and muzzle velocity attainable with current technology. The caseless ammunition design will minimize installation weight.

The engine for the Air Force's F–15 fighter is on schedule and should complete its preliminary flight-rating tests in February 1972.

AIRCRAFT TESTING

Chairman ELLENDER. What about the F–15 as to testing results?

Dr. FOSTER. The F–15 is coming along very nicely. As I indicated, the McDonnell-Douglas Corp. plans to begin flight testing around the middle of the summer.

Chairman ELLENDER. The Air Force is requesting approximately $450 million for the procurement of the first 30 operational F–15 aircraft, and as you stated, you do not plan to start flight testing until the middle of the summer. Do you think you are justified in requesting funds for the production of operational aircraft before you have started the flight test program?

Dr. FOSTER. We expect that when the time comes to exercise the production option we will have had enough test experience to make that decision. However, I would like to add that I think if we had it all to do over again, we might well have allowed the procurement milestone to slip a little more than it now has. I think we would like to have had a little more flight experience. Now, that is judging in advance of the facts.

Chairman ELLENDER. What will happen if the time comes to exercise the production option and you are not satisfied with the results of the test flight program?

Dr. FOSTER. When we get to that stage, if we find tests are not going well, we won't proceed with procurement. If they are going ahead well, we will. Those are the ground rules that Secretary Seamans is using in conducting this program. I would hope that the committee would accept that as a fair arrangement, given the urgency of replacing the F–4 aircraft in the Air Force fleet.

Senator SYMINGTON. Are you talking about the F–14 or F–15?

Dr. FOSTER. The F–15.

NEW ENGINE VERSION FOR F–14 AIRCRAFT

Senator YOUNG. Mr. Chairman?

Chairman ELLENDER. Senator Young.

Senator YOUNG. I note your comments, Dr. Foster, about the Air Force's F–15 fighter engine.

Dr. FOSTER. Yes, sir.

Senator YOUNG. Will this engine be useful in the F–14 without too much change?

Dr. FOSTER. Yes, sir; that is the program that has been underway for a number of years.

Senator YOUNG. It is not exactly the same, is it?

Dr. FOSTER. It is a higher thrust version. The F–15 engine sea-level, static, maximum, uninstalled thrust runs around [deleted] pounds. The F–14 engine thrust is around 28 thousand pounds.

Senator YOUNG. When you get this new F–15 engine installed in an F–15, could you use that in an F–14 without much change?

Dr. FOSTER. In theory, the answer is yes. In principle, you could put the F–15 engine as developed into the F–14. It would result in two things: One, fairly substantial changes to adapt the engine to the airframe. Second, some small changes in the engine. The F–14 and F–15 engines have common cores, but their fan sections and engines are different to optimize performance at the different portions of the flight envelope that are important to their differing mission requirements; for example, Navy engine requirements specify loiter at 35,000 feet, but the Air Force does not need this.

Senator YOUNG. Would it be as good an engine as the one that had originally been planned for the F–14?

Dr. FOSTER. The engine now flying in the F–14A is the P. & W. TF–30 with a rated maximum thrust of 20,600 pounds. While the F–15 engine would provide a [deleted] increase in thrust per engine [deleted] and be [deleted] pounds lighter, the Navy version—the F401—produces 28,100 pounds per engine (an increase of 27%) and is still 550 pounds lighter than the TF–30 it would replace.

AIRCRAFT ENGINE STATUS

Chairman ELLENDER. What is the current status of the version of this new engine that would be used in the Navy's F–14 aircraft—the F–14B? You know there are some people that contend we should delay the production of the F–14 until this new engine is available.

Dr. FOSTER. The status is as follows, Mr. Chairman. We have a contract on the F–14 with the Grumman Corp. that calls for F–14A's. We have placed orders, and we could place an order this fall; the option is for an additional number of aircraft, and they could be A's. While there is a provision in the contract to permit switching over to B's, there is no decision as yet by the Department of Defense to go to B's.

Chairman ELLENDER. It is my understanding that a decision to use the new engine and produce F–14B's does not involve a renegotiation of the total production contract. In other words this can be accomplished through an adjustment to the existing contract.

Dr. FOSTER. Yes, we would have to adjust the contract.

AIRCRAFT COST

Chairman ELLENDER. I assume that the F–14B will cost more than the F–14A in view of its increased capabilities. Could you give us an estimate of how much more the F–14B's will cost?

Dr. FOSTER. Yes, an F–14B would cost an estimated $1 million per airplane more for the new engine and for necessary airframe modifications. However, the decision to be made this fall is whether or not to go forward with the next lot of F–14 airplanes, which presumably would be F–14A's.

F–14 AIRCRAFT PROCUREMENT: CONTRACT OPTION

Chairman ELLENDER. As I understand the situation, the prime contractor has advised the Navy that they will not produce the 48 aircraft in the lot V option in accordance with the terms of the existing contract. However, the position of the Department of Defense is to insist on production of these aircraft under the terms of the contract.

Dr. FOSTER. You are correct, Mr. Chairman. We expect to exercise the option on the 48 aircraft.

F–14B ENGINE DELAY AND CONTRACTOR CHANGE OF PRIORITY IN FAVOR OF F–15 ENGINE

Senator SYMINGTON. Mr. Chairman, we know the F–14 obtained long leadtime on the F–15 because the Congress agreed with the Navy, and I think very properly, that the F–111 for the Navy was not adequate. Then the Navy wanted to proceed with the Phoenix missile, so they designed the F–14A around that missile. They also stated that as soon as possible they would go to the F–14B and get the performance originally contemplated for that airplane.

As I also understand it, the Navy has now withdrawn its funding support of the F–14B engine which in turn will increase the price to the Air Force of the F–15 about half a billion dollars. This is comparable to the effort made with the A–7. By getting the powers that be to direct Air Force production of the A–7 there was replacement of what I thought were better airplanes for the mission of the Air Force.

In any case, Mr. Director, what is the reason the Navy is withdrawing its financial support from the development of the F–14B engine?

Is it because we understand now that the cost of the F–14, a fighter, is going to be some $20 million a plane?

Dr. FOSTER. Senator Symington, the situation is as follows: The Navy has a current program for the production of 86 F–14's. The Navy is not at this time committed to buying F–14B's. The Air Force and Navy are jointly developing a new engine with two versions: The F100–PW–100 for the F–15 and F401–PW–F400 for the F–14B. When engine development problems arose early in 1971 precluding delivery to the Navy of a satisfactory article on original schedule, emphasis was shifted toward readying the engine for the F–15 and letting the Navy stay with the TF–30 (F–14A's) until development problems were solved.

AIR FORCE AIRCRAFT COST INCREASE

Senator SYMINGTON. Why does all the additional expense have to go against the Air Force, which will increase the F–15 cost a half billion dollars?

I was very respectful of that great General McCutcheon, the Marine general who wanted a V/STOL airplane instead of the F–4's. But now General Cushman testifies the Marines want F–14's at a cost of $20 million apiece. Why can't both services participate in the cost of the F–14B/F–15 engine? Why saddle all the cost on the Air Force?

Dr. FOSTER. Senator Symington, the Air Force and the Navy are jointly participating in the development of this engine on a near 50/50 basis. The Navy didn't exercise its option to buy 59 production aircraft last September because the engine was not ready to go into production. When the Navy contract option was not exercised, Air Force engine costs—specified in their contract—were no longer valid and had to be renegotiated. Since the Air Force has now become the initial user of the engine, certain cost increases have been identified such as: reduced production rates and higher learning curve penalties from Pratt and Whitney as well as the subcontractors; shift of initial production tooling costs from Navy to Air Force; abnormal escalation due to inflation; and revised profit computations to the contractor. These added costs to the Air Force may perhaps reach as high as $330 million. The new Air Force contract provides for 1047 engines vice the original 846 engines, accounting for the additional funding to over $500 million.

F–14 AND F–14B AIRCRAFT DIFFERENTIATION

Senator SYMINGTON. Dr. Foster, the F–14A would, in my opinion, never have been approved by the Armed Services Committee and the Tactical Air Subcommittee if the Navy had not emphasized they were going to the F–14B engine as soon as they could.

There is little difference between the F–14A and the present airplanes.

Dr. FOSTER. Senator Symington, I can't agree with you that there is very little difference between the F–14A and the present airplanes. The F–14A is a major improvement over the F–4, the Navy's current fighter, as was aptly demonstrated by Navy pilots during the preliminary evaluation last November and during the recent test flights by two of the Navy's top fighter pilots.

We have a fine airplane in the F–14. In addition to carrying the AWG–9 and Phoenix missile, it has proven to be an outstanding dogfighter.

Frankly, I think the issue is sufficiently important that it makes sense for our country, having two kinds of air forces, to have two approaches to this problem.

Chairman ELLENDER. Proceed.

TACTICAL LAND WARFARE

Dr. FOSTER. I was covering some of the items in the tactical air warfare area. Let me move now to the tactical land warfare area.

M60A2 TANK

Previous design deficiencies in the Army's M60A2 tank have been resolved and tested, and the tank is now entering production. This provides for the first time a tank with a missile capability for accurate firepower at a range more than [deleted] that of tank guns.

LANCE MISSILE

Lance successfully completed engineering development in 1971 and is now undergoing final Army engineering and service testing. (Testing has recently identified a possible warhead malfunction whose solution should not require additional funding or delay IOC.) Lance is scheduled to replace Honest John and Sergeant and, when completed, will be our [deleted] surface-to-surface nuclear delivery system in the range from [deleted].

IMPROVED HAWK MISSILE

The Army's concerted reliability-improvement program on the improved Hawk has demonstrated 16 successes out of 18 flights. Production of the system has started, [deleted] operational capability for field Army air defense in an ECM environment.

CHEYENNE HELICOPTER

The Army's Cheyenne helicopter successfully passed an extensive series of developmental tests, eliminating earlier problems of control-system instability. The program provides a new capability for direct aerial fire in support of ground forces during day, night, or adverse weather, in a more modern airframe with significantly increased performance, agility, payload, and standoff weapons delivery.

SELECTION BETWEEN CHEYENNE AND A–X AIRCRAFT; FUNDING ADEQUACY

Chairman ELLENDER. Doctor, do you think that the funds provided for fiscal year 1972 for the Cheyenne and those provided for the A–X are sufficient to make a determination as to which should be placed in our inventory?

Dr. FOSTER. The short answer to that question is, yes. I do believe there is enough money to find out the performance characteristics of each of these aircraft in fiscal year 1972. But in addition we need fiscal year 1973 money to carry out the test.

Chairman ELLENDER. To reach a determination as to which one?

Dr. FOSTER. Mr. Chairman, it is not our position that we will choose either the Cheyenne or the A–X. We do not know what decision we will reach, to be quite honest about it. If I may, Mr. Chairman, I would like to expand on that.

We have in the U.S. military a fairly strong feeling for the importance of saving lives on the battlefield. In Southeast Asia, in battle after battle, air support was used to turn the outcome in favor of the American forces or the South Vietnamese forces.

Time after time we have reviewed a battle or war with the conclusion that air support was warranted.

Now, in the A–X we are looking at an aircraft which is under competitive development. The whole question is whether or not, with the prime interest on cost, you can get an aircraft that does a much better job than any of the aircraft we have had in the inventory up to this time. That is the question.

Chairman ELLENDER. It is not a question of a choice?

Dr. FOSTER. In my view, it is a matter of providing close support to the soldier on the battlefield.

Chairman ELLENDER. The need for a close air support aircraft is a matter I discussed with Mr. Packard on several occasions. I had hope that we could make a decision to proceed with the full development of only one of these aircraft—the Air Force's A–X or the Army's Cheyenne, but not both. However, I was told that we had to develop both of them in order to make some actual tests and comparisons to determine which of the two could best perform the close air support mission.

The budget for fiscal year 1973 includes $48.1 million for the continuation of the A–X development program, and $53.5 million for the continuation of the Cheyenne program. It does not seem that the Department of Defense is going to make a decision to produce only one of these aircraft.

Dr. FOSTER. In my discussions with him, sir, I did not get the impression that he had as yet made a decision whether to produce only one of these aircraft or more than one.

Chairman ELLENDER. With whom?

Dr. FOSTER. With Mr. Packard.

Chairman ELLENDER. When did you have the discussions?

Dr. FOSTER. As recently as 2 weeks ago, sir. Mr. Chairman, let me add a bit here.

The A–X, in my view, will be superior to the A–7, the A–37, the A–1—indeed, any aircraft we have or have had in the inventory in providing close support. It is being completed under a fixed-price design for production as a unit cost of $1.4 million in current-year dollars.

We are using a revolutionary management approach in the control of weapon systems. The airplane that results should be better than any fixed-wing aircraft we have.

Now, that does not mean that under all conditions this will be better than any other aircraft in providing close support.

Cheyenne Air-To-Ground Offense

Let me now go to the Cheyenne. The Cheyenne is the latest technological concept in air-to-ground tactical offense by helicopter. What is special about that, of course, is the helicopter characteristic—takeoff, landing, hovering, and so on. This aircraft, however, has in addition a very special weapon capability. It can engage the target at any attitude, at any angle. Once it sees the target, it can begin to engage it optically and then with weapons for a full 360 degrees of azimuth. It puts on target for the first time the combination of sight and bullets or missiles, in spite of the fact that the vehicle is moving and turning.

Chairman Ellender. You have to see the target, though.

Dr. Foster. Yes. You have to see the target. But the fact is that you can see the target. The airplane has a computer that solves this kinematic problem, which for decades has made it almost impossible to hit targets. That means because the helicopter will be flying slower, it will acquire the target more often.

Second, because it has a very advanced system for delivering the ordnance on the target, there will be a higher probability of killing the target.

Third, because it is a helicopter, it can escort other helicopters and provide defensive fire support in the landing zones and en route. You cannot escort helicopters in all weather conditions in which you can fly helicopters with anything other than a helicopter. Therefore, for the escort gunship role, something like the Cheyenne is needed.

Selection Considerations

Now, how many are needed, in my view, has to do with how much you want to use the gunship in close support, as compared with the A–X and A–7 in close support, and so on.

Chairman Ellender. But we still have the question: which of the two, the A–X or the Cheyenne, can perform the close air support mission the best?

Dr. Foster. Yes, sir. That is a very difficult question to answer. There is no doubt that, in an attack in heavily defended areas, the A–X can deliver more ordnance with less exposure and vulnerability than the Cheyenne; also there is no question that the Cheyenne can rapidly acquire the target and deliver ordnance at standoff distances without passing over the target; but at the same time it is more vulnerable because it is not moving fast.

Cheyenne All-Weather Avionics and Weapons: Aircraft Cost Increase

Senator Young. Dr. Foster, may I ask a question? You did not state, as this report does, that the Cheyenne will be able to operate in adverse weather or at night. What capability does it have of finding a target at night?

Dr. Foster. Associated with the Cheyenne's development is an avionics system that does enable it to operate at night. It has full avionics for night and adverse weather conditions.

Senator Young. Are these avionics very expensive?

Dr. Foster. Yes.

Senator YOUNG. How much per plane?

Dr. FOSTER. That is really what is driving the price of the Cheyenne up. It is not so much the airframe and engines. It is the avionics equipment and weapons.

What keeps the A–X's price down is that it does not have an all-weather and night-vision capability. When one adds this capability, the price will go up. One can install a million dollars worth of night-vision avionics equipment.

Senator YOUNG. To me there is an important difference between the two. I don't know which is the better.

Dr. FOSTER. I think, Senator Young, it is fair to say that if the Air Force were to put the A–X into the inventory—and in discussions with the Army it was felt that we need good heavy support in all weather and at night—we would be putting more avionics and night capability into some of the A–X aircraft and the price would go up.

Senator YOUNG. It could be put in the A–X?

Dr. FOSTER. Yes, sir; certainly.

COST DIFFERENTIAL

Senator SYMINGTON. When I was in Israel, they were strong for the A–4, made by McDonnell-Douglas. I now have a report from the Air Force on the A–X as against the A–4, and am satisfied in my own mind that the A–X is a major improvement over the A–4. It is my understanding also that you can buy two to three A–X's for the price of one Cheyenne. Doesn't the question of price come into the picture?

Dr. FOSTER. I think to answer that you would have to make the same kind of analysis, Senator. The A–4 is an extremely attractive airplane because, as you know, it is simple.

Senator SYMINGTON. I agree the A–X is better than the A–4. But if you can buy three A–X's for one Cheyenne, does not that figure as important in the decision?

ALL-WEATHER ESCORT OF HELICOPTERS

Dr. FOSTER. Yes; it does, sir. But if you have three A–X's or three A–4's you could not escort helicopters in all weather into a landing zone. There are some conditions under which you could not do that. We have had a revolution in Southeast Asia in the use of helicopters. Time and time again the thing that permitted us to put the helicopters on the field or get the troops off was our ability to get the gunships into the area to supply firepower. If conditions were such that fixed-wing aircraft coud not operate, those troops, without helicopters would not have had that support. So the helicopter gunship has made a major contribution already in Southeast Asia. It is far short of the kind of capability that we could have. It is far short of the capability that exists in the Cheyenne.

STOL AND V/STOL AIRCRAFT

Senator SYMINGTON. The potential in the V/STOL design was one reason I was for the Harrier. Is the V/STOL concept, along with the STOL concept, out of the picture now?

Dr. FOSTER. No, sir; I don't think so. Of course. an A–X could be looked upon as a STOL of sorts. Certainly the Cheyenne is a V/STOL type. The Harrier, of course, is both.

SELECTION DECISION DELAY

I think, quite frankly, gentlemen, that we may be pushing this issue a bit too hard too soon. The Cheyenne program was delayed. So we are not asking for money in the fiscal year 1973 budget to procure the Cheyenne. We are not asking for money to procure the A–X. But we are asking for money to develop both of these approaches to the point at which we can see whether or not we have the problem of picking one, or whether or not we have the problem of trying to fund both of them into the inventory. So I think it is not a fiscal 1973 problem, although I do believe that deciding whether to buy one or the other or how much of each to buy is a difficult judgment. We are going to defer that judgment and see the result of the test. I don't see a way for us to make the decision right now nor do I see the need for it.

Chairman ELLENDER. Proceed.

CHEYENNE DEMONSTRATION OF IMPROVED HAWK AND TOW MISSILES

Dr. FOSTER. I was mentioning that the Army was having some successes in the improved HAWK as recently demonstrated and the Cheyenne.

Then we have made some successful tests of TOW missiles fired from the Cheyenne. Tests on [deleted] from helicopters so as to protect them against [deleted] were also successful.

Continuing in the mission area of land warfare, we have just selected the winner of the competition on the Army's UTTAS helicopter powerplant. We have made a number of successful tests on [deleted] that homes on a laser-designated target.

Senator CASE. Excuse me. Is that a gun?

Dr. FOSTER. Yes, sir. Actually, instead of using a conventional artillery round, you replace it with a round that has fin stabilization rather than spinning stabilization. The projectile homes on a laser-designated spot in the target area in just the same way that these so-called "smart" bombs home in on a target when you drop them from an aircraft.

The advantage is this: There were times in Southeast Asia when we used something like $2 billion worth of artillery rounds each year, and most of them didn't hit the target. In this case, when the forward observer sees enemy tanks or bunkers or personnel, he could designate them with a laser and call up for artillery. A few of these rounds will go into the area very close to the laser spot. [Deleted.]

We can see the enormous increase in efficiency and effectiveness and the reduction in the cost of artillery we would realize if we were able to use this particular approach.

Senator CASE. The laser is guided by actual vision, man's vision, and kept on target?

Dr. FOSTER. Yes, sir. You hold what is essentially a ray gun on the target and wait for the shell to arrive. You only have to hold it there for a minute or two. If you get word that the shell is just being launched, you can do it for just a few seconds.

Mark 48 Torpedo

The Mark 48 torpedo is undergoing final naval evaluation and is doing well.

Mark I Lamps Helicopters

The Mark I LAMPS helicopters have become operational on fleet frigates and will soon join the destroyer fleet for cruise-missile defense and ASW, extending ships' range capabilities [deleted].

Versatile Avionics Shop Test (VAST)

Thirteen sets of versatile avionics shop test (VAST) equipment have now been delivered and will soon be helping reduce maintenance time for sophisticated naval aircraft. First sea trials of the VAST equipment will take place aboard an aircraft carrier this year.

E2C Aircraft

The Navy's E2C program has demonstrated a fivefold increase in reliability and maintainability of this airborne early warning and command, control and communications aircraft over its predecessors in a product-improvement program that is within DCP specifications and costs and is ahead of schedule.

That, you know, was the salient weakness in that aircraft's predecessor when it was used in the Tonkin Gulf—keeping that radar in operation. It is very gratifying to see these new systems doing so well.

Vulcan/Phalanx Gunship

The Vulcan/Phalanx, which is a radar-controlled gunship, demonstrated some remarkable accuracy in destroying what is a simulated cruise missile.

[Deleted.]

Fast-Reaction Shipboard Electronic Warfare System

The Navy's fast-reaction shipboard electronic warfare system for major combatant ships, Shortstop, successfully demonstrated its capabilities in sea trials.

S–3A ASW Aircraft

The S–3A carrier-based ASW aircraft progressed through (1) a successful first flight and (2) a successful laboratory demonstration of the integrated avionics system—both two months ahead of schedule. The S–3A will replace the aging S–2, and will improve [deleted] the effectiveness of carrier-based ASW against Soviet submarines.

Harpoon Antiship Missile

Captive flights of several candidate seeker heads for the Harpoon antiship missile were successfully conducted against ship targets. The prime contractor for Harpoon has been selected. This missile will provide the Navy a surface- and air-launched antiship weapon with a range of [deleted] miles.

One of the highest risk electronic components of the Navy's AEGIS surface-to-air missile system, the high-power transmitter tube, has successfully passed a 5,000-hour life test without failure.

Weather Satellite Information

Weather satellite information is now being received directly by an aircraft carrier deployed in WESTPAC with a new test readout station aboard, shortening delays in the receipt of weather information [deleted].

TECHNOLOGY BASE

Detection of Ballistic Missiles and Reentry Vehicles With Infrared Sensors Aboard Spacecraft

We have successfully demonstrated the ability to detect ballistic missiles and reentry vehicles in midcourse flight with infrared sensors. This suggests the possibility of our eventually being able to [deleted], simplifying some aspects of ballistic-missile defense.

We have uccessfully test-fired controllable-thrust, restartable solid-propellant motors with integral thrust vector control. This could be also of great eventual value to advanced ballistic-missile interceptors.

Technology Feasibility Demonstration

Chairman Ellender. How long did it take to develop this concept?

Dr. Foster. Mr. Chairman, this part of the work deals with the technology base; these are demonstrations of technological feasibility.

It may take one or two or three experiments to convince us that it is feasible. However, to make that into a weapons system would probably take 3 to 6 years of very careful design and engineering and testing and some preproduction considerations.

DERIVATION OF CONCEPTS

Chairman Ellender. Where do you get your ideas for what you have discussed here?

Detection of Ballistic Missiles at Long Range: Chemistry, Physics, and Electronics Working Together

Dr. Foster. They are not my ideas. This is a critical matter. Let me use it to expand upon a point you made earlier. The ability to detect ballistic missiles at long range, for instance, comes out of work on detector materials, which have shown that one can detect objects in space. [deleted]. This is what is called [deleted]. It is chemistry and physics and electronics, all working together. We have reached the point now where people can speculate about the possibility of using this technology to find not only stars in space, which we have done optically for a long time, [deleted].

Last year we flew a missile from the United States over into the Pacific. As it passed over [deleted], we saw that object against the background; we saw it [deleted] away. What that means is that we can detect objects [deleted] away that are about the size of a [deleted]. That means that an interceptor missile has more time to make the interception and can do so at a greater distance. It means that you might cover a bigger area of the country and can have fewer ABM sites. That means it it would be a less costly system.

University, Industry, and Government Contributions to Basic Technology

Now, this is a technological-feasibility demonstration of a principle, not a weapon system. It may be possible to build a weapon system that is reliable. If you look at it in detail, you see that the ideas for this came from universities, from research in private enterprise, from research on the industrial side, and in fact from in-house laboratories. Everyone contributed to some of the basic technologies concerned here. This has been evolving for about 5 or 6 years.

Possible Evolution of Weapons System

I don't believe we could be really confident that we could build a weapon system at this stage, but in 2 or 3 years we might well decide it looks serious enough that we might want to make some demonstrations. The system might be built in [deleted].

Chairman Ellender. I suppose that is where a good deal of the money goes, hit and miss.

Dr. Foster. Yes. Little can be guaranteed.

Chairman Ellender. There seems to be no plateau.

Electronic Component Demonstrations

Dr. Foster. Three probably significant new electronic components were demonstrated in laboratory tests: (1) Charge-coupled devices promise to simplify low-light-level television systems by eliminating expensive vacuum-tube cameras; (2) microwave acoustic devices have the potential of becoming smaller, cheaper alternates for microwave signal processing required in electronic-warfare systems; and (3) solid-state transferred-electron amplifiers may replace more expensive traveling-wave tubes in many applications.

Diving Technology

Diving technology progressed rapidly. Tests have indicated that men can live, work, and breathe at pressure depths to 5,000 feet. Further devices have been developed to detect bubbles in a diver's blood and to prevent loss of body heat to cold gas inhaled from bottles.

Graphite-Fiber/Epoxy Technology: Fabrication of Horizontal Stabilizers and Wing Flaps For A–4 Aircraft

Graphite-fiber/epoxy technology has progressed far enough to justify the fabrication of horizontal stabilizers and wing flaps for the Navy's A–4 attack aircraft. Potential payoffs are weight reduction of 30 percent and fatigue-life increases of 200 percent over those of current aluminum structures.

Machine-Aided Translation of Languages

Large-scale machine-aided translation of English technical material to Vietnamese was demonstrated, and significant improvements in the Russian-to-English system were completed. We have done this actually with whole texts. We have taken a text in English and turned it out in Vietnamese just through a computer. It is a major accomplish-

ment. Now we are not ready to do it in a wholesale way. We have demonstrated that we can do chapters on various subjects without making any misstatements of fact, though there are times when we get into trouble with ways of expressing ideas.

Animal Spinal-Cord Injury Tests

Animal tests of spinal-cord injuries have shown that severity is largely dependent upon swelling. Injury can be reversed by operation and drugs as late as 4 hours after its occurrence.

Malaria Drugs and Vaccine Tests

New drugs showing substantial promise against chloroquinine-resistant malaria have been successfully tested in humans and animals. Human tests for safety of a vaccine against malaria have been started.

Priority Requirements of Cost, Performance, and Schedule

Even though we have made substantial progress during the past year, we will have many problems. As you know from your review of selected acquisition reports, the most frequent problem is cost. Because of unexpected technical problems, bad initial estimates, and inflation, many development programs still grow in cost and development time. Even if they are fully successful, when finally completed they carry the stigma of failure. Classically, the entire R.D.T. & E. community—and the military themselves—have favored performance over schedule and schedule over cost. During the coming year, we plan to concentrate even more on readjusting these priorities, until cost becomes as important as performance and schedules are delayed to accommodate both.

Trouble Areas

As you know, we have specific programs with specific problems. They are typified by the following examples. I bring them up just to make the point that I have not ignored our troubles.

F–14 Aircraft

The loss of the first F–14 delayed the program about 6 months. That delay, combined with cost growth, has caused the program to be restructured. The contractor has announced that he will not honor further production options under the contract.

Defense Communications Satellites

After a successful launching of two new Defense communications satellites in November, the satellites failed to respond properly. The problem is being investigated.

We have one of the satellites working reasonably well. It will probably never have all the functions intended, but it is being turned over for operational use. We are now giving our attention to the other satellite.

Condor Missile

The Condor air-to-surface missile was a case of expecting too much performance too soon [deleted]. Because of these delays and reduced procurement quantities, costs have risen substantially.

S–3A ASW Aircraft Inflationary Cost Increase

Inflation has driven the unit cost estimates of the S–3A ASW aircraft up by $1.1 million per aircraft. When the development contract was awarded in August 1969, it was expected that we would be able to procure [deleted] aircraft for a unit cost of $11.5 million. The current estimate is $12.6 million. The increase is attributable to the fact that actual rates of inflation were higher than expected and contractor overhead rates increased because of the reduced overall level of business activity.

Mk 48 Torpedo

The Mk 48 torpedo, an excellent example of how competition can reduce unit cost as well as improve the final product, had severe technical problems early in its development because we underestimated the technical complexity. Most key performance criteria have been met, but at a high cost [deleted]. It is now doing better, [deleted].

A–7D/E Attack Aircraft Cost Increase

Although the A–7D/E attack aircraft is a very successful program from the viewpoint of performance, unit costs exceeded original estimates by $900,000 per aircraft as a result of production stretchout, reduction of the total aircraft buy, and added [deleted] features.

Lance Missile Cost Increase

The Lance surface-to-surface missile program is late and costs have risen because of significant design changes [deleted] and to solve technical problems [deleted].

Cheyenne Helicopter Cost Increase

The Cheyenne program, while out of the woods technically, is currently projected to be about 85 percent more expensive than was planned, partly as a result of adding night vision and TOW capabilities to the original requirement.

MBT–70 Tank Austere Version

The MBT–70 tank design became too expensive, so we reoriented the program to develop an austere version with somewhat reduced performance and a 30-percent lower production cost. It is now evident that this reorientation, while in the right direction, did not go far enough.

RUSSIAN AIRCRAFT CAPABILITY VIS-A-VIS UNITED STATES

Chairman Ellender. Why is it that the Soviets seem to be so successful in developing all the planes that they have, such as the Foxbat, while we are still in trouble over the F–14 and F–15?

Dr. Foster. Mr. Chairman, I think in part one gets that impression about the Soviets because they don't air all of their problems.

Chairman Ellender. No, but they produce.

Dr. Foster. They do produce. However, they also have a lot of difficulties. We know they have difficulty with their supersonic transport.

Chairman ELLENDER. You mean after they are in production?

Dr. FOSTER. No, while in development.

Chairman ELLENDER. But as Senator Symington has pointed out many times in this committee, they seem to have several new types of planes produced during the same period when we have produced virtually nothing.

Dr. FOSTER. In the 1950's we had a dozen Century series-type aircraft under development and some in production at one time, and we produced them and they went into the inventory. Of course, later it was felt we were doing too much of that so we turned it off in the 1960's. Now, we feel we haven't had enough recently so we are turning it on in the 1970's. We tend to cycle a bit. The Soviets apparently don't. They have maintained a rather steady rate, greater than ours when we were cutting back, and less than ours when we were accelerating.

DEVELOPMENT PROCEDURE

Senator YOUNG. They have gone more to the prototype approach than we have in the past. Isn't that partly responsible for it?

Dr. FOSTER. Senator Young, I think we have that impression today, but in fact they don't build a lot of prototypes that are then abandoned. Most of the things they test and develop are put into production. They do go through the state of looking at prototypes of aircraft for quite a while; next they make engineering versions of them and then produce them.

STRATEGIC MISSILES

However, they don't do that at all in their strategic missile program. We talk about "fly-before-buy." The Soviets buy before they fly. They go out and dig holes for SS–9 and SS–11 missiles before they put the first missile on the stand for test.

RUSSIAN HEAVY AIRCRAFT PROGRAM

Senator YOUNG. The missile program methodology is apparently directly contrary to that of aircraft development. They have been showing new prototype planes every May Day for years.

Dr. FOSTER. Yes. But what you might think of as a crash effort in their strategic air program has all the concurrency one could conceive. In the aircraft area, however, they have a heavy program though with much less concurrency. It has been larger than ours for about a decade and is going along at a steady pace.

U.S. DEVELOPMENT OF AIRCRAFT WITH UNNECESSARY CAPABILITY

Senator YOUNG. Isn't there one other significance? Everything they produce is more austere and simple, yet seems to do the job? We have been loading down our planes with a high degree of refinement and capability. The C–5A was a good example. There was no need for the C–5A to have the capability of landing on a dirt runway.

Dr. FOSTER. Sir, generally, I think that is true. We have had a tendency throughout our whole history to push technology as far as we could in each development. But the Soviets are now showing the same trend. Their Foxbat is a pretty sophisticated airplane. It is a

much more sophisticated airplane than anything they have built previously. The trend in their aircraft is to make them larger and more sophisticated. The trend in American airplanes has been also toward the larger and more sophisticated. The difference is that they are a number of years behind us. I suspect they have ingrained in them a greater discipline to hold down the extras, a discipline that is quite similar to the discipline we are now raising in the A–X program. If you were to go to the manufacturers and look at that program, you would see that the components look quite a lot like those of the Soviet aircraft.

What I am trying to say is that there are some similarities. I think we tend to oversimplify the comparison. The Soviets do build prototypes, but there are some cases where they don't have them at all. We are now going more to prototypes, and I think that is the right direction. The Soviets tend to be more austere and I think we have been too lavish. We are trying to correct this situation.

SOVIET R.D.T. & E. ACTIVITIES AND RESULTS

A large portion of my statement last year was devoted to our concern over expanding Soviet military technological investments and capabilities. Our major focus still remains on the Soviet challenge, and we have further evidence to accentuate that concern. I would now like to give a short summary of our efforts this past year to assess the importance of Soviet R.D.T. & E. activities relative to the present and future security of the United States.

Mr. Chairman, I must stress this point: We are not comparing ourselves with the Soviet Union strictly on a budget-to-budget basis in the hope of wringing larger budgets from the Congress. We are comparing ourselves with them because a comparison of today's R.D.T. & E. programs in type, scope, and level provides one of the major indicators of possible future challenges to our security.

Decision to Overtake and Surpass United States in Military Prowess and Scientific Preeminence

In retrospect, it is clear that Soviet leaders made a fundamental decision some years ago regarding the role of the U.S.S.R. in the international arena that will continue to dominate their policies in the 1970's—to overtake and surpass the United States in military prowess and in scientific preeminence. Observers both inside and outside the Government are beginning to share our appreciation of what such a Soviet decision and commitment can mean to the United States.

Manpower, Facilities, and Resources Commitments

The sincerity of the U.S.S.R.'s commitment to the goal of technical military superiority is evidenced by the manpower, facilities, and material resources it has allocated to produce the modern weapon systems that it has developed and deployed in large numbers.

In the past 10 years, the Soviet Union has surpassed the United States in the number of scientists and engineers holding advanced degrees.

Capital investments in Soviet military R.D.T. & E. have grown substantially during the past decade. [Deleted.]

Soviet naval research institutes have nearly doubled in number during the past decade, while U.S. naval research facilities have, on balance, decreased.

The Soviets have taken notice of past U.S. reductions in military R.D.T. & E. expenditures, but their public statements and new 5-year plan describe a continuing and systematic increase in their own efforts.

Demand for More Efficient, Productive Effort With More Output per Ruble

The Soviets are openly demanding of themselves a more efficient, productive R.D.T. & E. effort with more "output per ruble."

Chairman Ellender. Why couldn't we do that?

Dr. Foster. We do. We do demand—and, in particular, the Congress demands—more output per dollar.

Chairman Ellender. I have the impression that the Soviet Government workers are more productive than ours are.

Dr. Foster. I am not sure we can support that view, Mr. Chairman. On the civil side, the number of people required in the United States to do a job is actually small, so in a sense we get more out of a person. We get it in large measure because we provide that person with technological advances that permit us to do the task with less manpower. That is, of course, clear in the farming area. In the military area, which side is more efficient is not as clear, but I still think that we do at least as well. We remain convinced that because of their greater total effort, our current U.S. technological superiority is in jeopardy.

During the 1960's, [deleted] significant Soviet military systems were developed—a comparable output to that of the United States, though often in different areas. These systems include the world's fastest interceptor, the world's largest strategic missile, [deleted] the world's largest helicopter, [deleted]. More than 50 new ships of all classes were developed, many aircraft systems were modified for naval use, and [deleted] types of naval missiles and [deleted] types of naval guns were developed. [Deleted] new systems for the Army were produced, including armored vehicles, artillery, antitank weapons, and [deleted] a new [deleted] tank.

Many of the significant "outputs" of operational systems in the 1960's were based on research resource "inputs" during the 1950's. The growth in R.D.T. & E. resource inputs during the 1960's indicates a continued Soviet commitment to new and improved systems in the 1970's.

Accomplishments Anticipated in 1970's

Since the past program of Soviet activity has yielded a steady and regular output of military equipment, the 1970's should reveal a continuation of equipment improvements and a growing inventory of significant new weapon systems. As a matter of fact, many new weapon systems will continue to appear, even if funds for new capital investment in R. & D. are sharply curtailed in the near future—since the prerequisite research is well along and Soviet momentum appears to be considerably greater than ours.

Within the 12 months since I last appeared before you, we have noted with some concern the following new developments within the Soviet Union that suggest important new emerging military capabilities.

[Deleted.]

Senator ALLOTT. Since this is a very highly sensitive matter, why couldn't we go off the record and let him talk freely on this?

Chairman ELLENDER. Off the record.

(Discussion off the record.)

Chairman ELLENDER. Proceed.

Dr. FOSTER. [Deleted.]

[Colloquy deleted.]

Chairman ELLENDER. How about the warhead?

Dr. FOSTER. There is no reason to believe, Mr. Chairman, that that warhead need be anything special. They can use a warhead that they have had in the past. [Deleted.]

[Colloquy deleted.]

Dr. FOSTER. These items, of course, represent only the visible tip of a much larger iceberg.

It is evident that we must increase our intelligence-gathering capabilities in the R.D.T. & E. area, as Mr. Laird has noted in his testimony. Consequently, we are deeply concerned by recent congressional cutbacks in our national intelligence-collection efforts.

U.S. FUNDING REQUISITE

Mr. Chairman, it is not necessary to emphasize to this committee that the continuing Soviet commitment to science and technology is in marked contrast to strong sentiments from a segment of the American public and some Members of the Congress. The Soviets firmly believe that a strong national R.D.T. & E. program can provide the mechanism for their becoming the world's dominant economic, political, and military power. It could be very unfortunate for the United States if inadequate support were given to the military R.D.T. & E. by which we maintain our slim and dwindling technological lead.

U.S. AND RUSSIAN SCIENTIFIC PRODUCTIVITY COMPARISON

With regard to relative productivity, I talk frequently with our own university scientists who, in turn, are openly engaged in discussion and exchange with their Soviet counterparts regarding nonmilitary R. & D. They assess the scientific productivity of Soviet universities and institutes as significantly less than our own—and their Soviet counterparts tend to agree. Although Soviet scientists are credited with as much brilliance and initiative as ours, they apparently lack the dynamic freedom of action, the instrumentation, and the responsive support that are provided in our universities and nondefense laboratories. Apparently the Soviet priority system constrains scientists in the civil sector, while allowing more freedom to defense scientists—whom we almost never see. This would, I believe, account for any disparity noted between the observations of our university scientists and those of our intelligence community, and is confirmed by the relative output of the civil sector when compared to Soviet space and military achievements.

U.S. TECHNOLOGY SUPERIORITY IMPERATIVE

The importance of our retaining technological superiority appears to be clear. Realistic deterrence depends on the knowledge and measurement of the relative strength of the United States and our allies

vis-a-vis our potential adversaries. As long as we retain technological superiority, we can make meaningful measurements of relative strength without fear of surprise. We can estimate their progress because we have already been there. Our free society can then compete more confidently and efficiently with secretive opponents. Once we appear to have lost that superiority, we lose our ability to measure our relative strength and to compete efficiently, and in due course we should lose confidence in the realism of our deterrence.

Allies' Participation

Chairman Ellender. Dr. Foster, you have given us a good accounting of what is going on in the Soviet Union. On our side, to what extent have our allies participated in this kind of work?

Dr. Foster. Do you mean, to what extent are our allies participating in research and development to maintain technological superiority or in the assessment?

Chairman Ellender. To maintain technological superiority.

Dr. Foster. I will come to that in just a few minutes, Mr. Chairman.

Chairman Ellender. All right.

Technical Comparisons of United States and Russian Equivalent Operational Systems

Dr. Foster. I would like to illustrate the current U.S. technological position relative to the Soviet Union's by some simple side-by-side technical comparisons of equivalent operational systems. I must stress from the outset that this is not what I will refer to later as a net technical assessment of combat capabilities; it is a far simpler and more primitive technical comparison of presently deployed United States and Soviet systems side by side, not face to face. It may reveal to you a more modest appraisal of our present superiority than you expected.

Russian Technological Superiority

We would currently credit Soviet-deployed forces with technological superiority in anti-ballistic-missile systems. [Deleted.]

Chairman Ellender. That is the Moscow system?

Dr. Foster. Yes, around Moscow.

Chairman Ellender. We have our ABM underdevelopment.

Dr. Foster. It is not in operation, sir. We are in the process of putting facilities in at Grand Forks and Malmstrom, but those are not yet operational. We have to wait 2 or 3 more years. The Soviets have one operational around Moscow—have had it for 2 or 3 years.

Chairman Ellender. There are a number of sites in operation and they are constructing new ones.

Dr. Foster. Yes, sir; in addition the Soviet-deployed forces are technoligically superior in—

Fractional-orbit ballistic missiles.

Strategic air-defense interceptors.

[Deleted.]

All aspects of civil and industrial strategic defense and recuperative planning.

[Deleted.]

[Deleted] tactical antiship missiles.
Surface attack ships (excluding carriers).
[Deleted.]
Chairman ELLENDER. Will you expand on that a little?
Dr. FOSTER. Yes, sir. [Deleted.]
Chairman ELLENDER. [Deleted.]
Dr. FOSTER. [Deleted.]
The Soviets have technological superiority in—
Antiaircraft artillery systems.
Some armored combat vehicles.
Medium- and high-altitude SAM air defenses.
[Deleted.]
Surface-to-surface tactical missiles.
Heavy-lift helicopters.

We would currently acknowledge approximate technological parity with Soviets in deployed systems such as:

[Deleted.]

Tanks and antitank weapons; satellite-tracking systems; satellite navigation systems; small arms.

But we believe we still retain our technological lead in deployed systems in:

ICBM guidance and penetration aids.
Strategic bombers.
Strategic submarines and SLBM's.
Attack submarines.
ASW sensors and patrol aircraft.
Satellite communication systems.
Airborne warning and control systems.
Airborne surveillance sensors.
Defense-suppression weapons and systems.
Deep-strike tactical aircraft.
Aircraft carriers.
Guided ordnance.
Air-to-air superiority weapons.
[Deleted.]
Man-portable air-defense systems.
Close-support helicopters, aircraft and aerial weapons.
Long-range logistic transports.
[Deleted.]
Artillery munitions.

Various experts are certain to disagree with individual details of these statements. However, the point here is not that we must excel in every area of warfare; it is simply to acknowledge that we have already reached a point in many areas where we do not excel.

FAILURE OF UNITED STATES TO MAINTAIN SUPERIORITY AGAINST DETERMINED COMPETITION

Relative to the popular image of unquestioned U.S. technological supremacy of the 1940's and 1950's, it is evident that we have not held our own against determined competition. More important, in those areas where we acknowledge technological parity or inferiority, we cannot have high confidence in our estimates of Soviet capability, nor

can we predict with confidence what their next step forward will be.

We must continue to focus on the need to maintain—and, where necessary, regain—a realistic level of technological superiority, particularly in our operational system. I see no security for us in pausing at some technological plateau when the Soviets appear committed to continuing their own impressive rate of progress. There is ample evidence that they are so committed—and none to the contrary.

RELATIVE TECHNICAL MILITARY CAPABILITIES OF UNITED STATES AND RUSSIA

Let us now turn to an assessment of the relative technical military capability of the United States and the Soviet Union in terms of the military systems that would oppose each other in combat, that is, offensive systems of one side against defensive systems of the other. It is the following assessment that identified our primary deficiencies—hence, our proposed R.D.T. & E. programs—not the foregoing treatment of comparable systems.

SUBCOMMITTEE RECESS

Chairman ELLENDER. I regret that the subcommittee will not be able to meet this afternoon, but there is another meeting scheduled. It is now 12:30 and I know some of the members have a luncheon commitment. Dr. Foster, can you return Wednesday morning?

Dr. FOSTER. Yes, indeed, Mr. Chairman.

Chairman ELLENDER. All right, if there are no further questions or comments at this time we will stand in recess until 10 o'clock Wednesday morning.

(Whereupon, at 12:35 p.m., Monday, February 28, the subcommittee was recessed, to reconvene at 10 a.m. Wednesday, March 1.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

WEDNESDAY, MARCH 1, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m. in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Young, Allott, Case; also present Senator Hollings.

DEPARTMENT OF DEFENSE

RESEARCH AND DEVELOPMENT PROGRAM

STATEMENT OF DR. JOHN S. FOSTER, JR., DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

ACCOMPANIED BY:
CAPT. BENJAMIN F. SHERMAN, JR., U.S. NAVY
COL. PHILLIP N. LARSEN, U.S. AIR FORCE

TECHNICAL ASSESSMENT

Chairman ELLENDER. The subcommittee will come to order. We continue with Dr. Foster. You may proceed, Doctor.

Dr. FOSTER. I am on page 1–17, beginning with the quotation from Admiral Moorer's testimony. I think it is sufficient to mention that he talked about the shift in the balance of military power.

Chairman ELLENDER. I believe we have covered that.

Dr. FOSTER. Net technical assessment:

To assist in evaluating the relative strengths and weaknesses of our opposing forces, the Department of Defense has given considerable emphasis to its net technical assessment program this past year. For selected critical areas, not all of which are discussed here, these investigations allow a determination of how well the Soviets are doing in achieving their goal of technical military superiority over the United States. In each case we have sought to identify any of our deficiencies and to determine the adequacy of the steps being taken to eliminate them.

Assessments of the relative military capability of Soviet and U.S. forces in the critical areas of strategic forces' survivability, the penetrability of ballistic-missile defenses and air-defense systems, and ocean control and overseas force projection [deleted].

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RUSSIAN OCEAN CONTROL CAPABILITY VIS-A-VIS UNITED STATES

Chairman ELLENDER. Would you compare Soviet control capability with that of the United States?

Dr. FOSTER. [Deleted.]

Chairman ELLENDER. How can they distinguish an American ship from one belonging to the British or Norwegians?

Dr. FOSTER. [Deleted.]

Chairman ELLENDER. [Deleted.]

Senator YOUNG. [Deleted.]

[Colloquy deleted.]

UNITED STATES AND RUSSIAN MISSILES

Senator YOUNG. Is our system as good as the SAM system?

Dr. FOSTER. The U.S. Hawk is, if anything, as good as, or better than, Soviet systems. Our Hercules is about as good. Both of those U.S. systems are quite old. However, the Soviets have us outnumbered [deleted] in deployed systems. We have little deployed defense capability in either surface-to-air or air-to-air systems.

VULNERABILITY OF AIRCRAFT CARRIERS

Chairman ELLENDER. In regard to the aircraft carrier, one bomb, precisely placed, could easily destroy it.

Dr. FOSTER. I don't think that is likely in the case of a conventional warhead, but certainly one must recognize that one nuclear warhead in the vicinity would destroy a carrier.

Chairman ELLENDER. That is what you can expect, in my opinion, in case of another war. The devastation could be worldwide. Yet neither the Russian people nor the American people want war.

Dr. FOSTER. Unfortunately, we have very little confidence that the Soviets feel that way.

Chairman ELLENDER. It is that fear which dominates our thinking and the thinking of the Russian leadership.

UNSATISFACTORY WARNING SYSTEMS

Dr. FOSTER. In addition, U.S. tactical warning systems for our strategic forces and the present basing of our strategic bombers are not satisfactory.

We credit the United States with retaining an advantage in [deleted].

UNITED STATES AND RUSSIA CHANGING TECHNOLOGICAL POSITIONS

The United States can no longer feel assured that it has unquestioned technical superiority over the Soviet Union. In my view, we must regain our earlier advantages of bomber survival and penetrability and an ability to project our forces, via sea power, to those places where we have vital interests. It is important to understand the changing technological position of each side.

I will now briefly summarize several of our assessments for selected critical areas, and briefly describe those actions we are taking to correct important U.S. deficiencies.

STRATEGIC BOMBERS

Strategic bombers: The momentum of Soviet developments in submarine-launched ballistic missiles and in sophisticated air-defense systems can have a serious impact on the survivability and penetrability of our strategic bombers unless corrective measures are taken by the United States.

[Deleted.]

The deficiency in survivability has led to the following corrective programs:

A new warning satellite system has been developed and initial deployment begins this calendar year. Improvements in the 474–N early warning radar system are also in progress. When these programs are completed [deleted] an adequate early warning system should be available.

The New Look plan of SAC provides for a phased relocation of bombers and tankers to inland bases and reduced reaction times for crews and aircraft.

Bomber penetration of Soviet air defenses will be assisted by——

Continue deployment of SRAM [deleted] to counter Soviet point air defenses.

Development and deployment of new ECM and terrain-following equipment for the B–52.

The development of SCAD to assist in the penetration of Soviet area air defenses.

[Deleted.]

BOMBER DETECTION

Chairman ELLENDER. Dr. Foster, we spent considerable time and about $1.5 billion on the development of the Air Force's proposed B–70 bomber. It is my understanding that one of the principal reasons for terminating this effort was the fact that it was designed to penetrate at high altitude and it was vulnerable to the Russians' high-altitude air defense systems.

If the Russians were able to develop a defensive system that would counter the B–70, what assurance do we have they will not develop an air defense system to counter the low-level penetration capabilities of the proposed B–1?

Dr. FOSTER. Senator Ellender, the basic difference is that the high flyer can be seen by the ground defenses for many miles, for example, as far as 150 miles if the aircraft is at high altitude. That means that the number of stations one must have on the ground for complete coverage is very small, because these stations could be 100 or 200 miles apart.

Let's take the case, however, of an aircraft coming in at an altitude as low as a few hundred feet. Then, the distance at which a ground station can first detect the aircraft is perhaps 25 to 30 miles. Therefore, stations would have to be 25 or 30 miles apart and one would need to have a large number of stations.

Chairman ELLENDER. Isn't it just a question of time until we develop something to detect the low flying bomber with some type of over-the-horizon technique?

Dr. FOSTER. We expect, Mr. Chairman, to have the capability to detect aircraft coming toward us before they get to the radar horizon

through this technique that you mentioned. I don't know how long it will be before we know the position of the incoming aircraft sufficiently well to attack it while it is over the horizon. That is the problem.

COUNTERING LOW ALTITUDE PENETRATION

Chairman ELLENDER. Have you any doubt that the Russians have the technological capability to find something that will protect them against low altitude bombers, as they did against the B–70?

Dr. FOSTER. If you are asking me if I have high confidence that low-altitude penetration will be countered by the enemy in the future, I must say that I don't have high confidence that it will and I don't have high confidence that it won't. I simply don't know.

Chairman ELLENDER. You seem to be more certain about other matters.

Dr. FOSTER. No, sir, I'm not. The basic problem in the use of an over-the-horizon technique is that to go over the horizon you must use very low frequency, and inherent in the use of very low frequency is a lack of precision in location. Without precise location, one has difficulty in knowing just where to attack incoming missiles or aircraft.

Chairman ELLENDER. That is present knowledge.

Dr. FOSTER. That is correct.

Chairman ELLENDER. But through the years our capability has improved?

Dr. FOSTER. Yes. sir, it has. But we cannot predict the future. I cannot say with confidence either that the B–1 will be allowed to get in scot-free, or that it will be most certainly destroyed.

The difficulty, Mr. Chairman, is that either we are to attempt to maintain a deterrent or we are not. If we are to do so, then we have to take whatever seem to be the best measures to provide for a deterrent capability in the future. We can see that present systems will reach the point where either they will spend more time in the shop than they spend on the line, or the attrition suffered in going through enemy defenses will require too large an initial force for us to maintain economically. It is for that reason that we are developing the B–1.

F–111 AIRCRAFT CAPABILITY

Senator YOUNG. The F–111 is about as fast as the B–1 will be, isn't it?

Dr. FOSTER. Yes, sir; they both have about the same speed at low altitude.

Senator YOUNG. Can the F–111 fly low, such as over North Vietnam?

Dr. FOSTER. Yes, sir, it could.

Senator YOUNG. Couldn't we use the F–111 in North Vietnam rather than lose other types of aircraft? The SAM missiles seem to be able to knock down quite a few of our low-flying very fast planes now.

Dr. FOSTER. We could put the F–111 back into Southeast Asia. You will recall that a group of those aircraft were used in Southeast Asia as the first operational deployment of the F–111. At that time, you may recall, we had some loss of aircraft for reasons that we do not clearly understand. At the same time, we detected in the test program something associated with structural problems in the aircraft, and for that reason they were recalled from the theater.

F–4 AND F–111 AIRCRAFT COMPARISON

Senator YOUNG. Can't the Air Force F–4 fly low at high speeds, too?

Dr. FOSTER. Yes, sir. The F–4 has no terrain-following radar; it can be flown low at level only in clear weather in daylight and requires constant pilot attention. The F–111 has automatic terrain-following radar and can be flown at low level in clear weather, at night, or in bad weather.

Senator YOUNG. Following through on Senator Ellender's reasoning, if they could knock down the F–4 and the F–111, couldn't they also knock down a B–1, or would there be a smaller percentage of B–1's destroyed?

STRATEGIC PENETRATION

Dr. FOSTER. I think it is fair to say they can knock down aircraft at low altitude. Strategic penetration of the Soviet Union is different from flights over North Vietnam simply because, in the case of the strategic system, it is a one-time attack. It does not have to take attrition day after day after day, as we have had to do in North Vietnam.

Second, the routes which the strategic aircraft would use are not known in advance. As a consequence, the enemy must deploy his forces across the periphery of the whole heartland. [Deleted.] We equip these aircraft [deleted] with an ability to destroy the defenses as they approach them. By having a high-performance airplane that runs at high speed at low altitude, we reduce the number of sites that can engage the aircraft, and we reduce the exposure time of the aircraft. Then we equip those aircraft with high-performance air-to-ground missiles so they can engage the radar systems and destroy them.

You can see there is a very different set of calculations for the one-time strategic attack, as compared with the day-after-day attrition that one must be able to cope with in the tactical situation.

B–52/F–111 AND B–1 AIRCRAFT SYSTEMS

These countermeasures, if pursued on the present schedule, should provide adequate penetration capability for the B–52/F–111 forces against present and projected threats through the 1970's. The SRAM and SCAD missile inventory, the revised bomber-base structure, and the tanker forces provided for the B–52/F–111 systems will be used by any future B–1 system. The B–1, with its many system improvements, is expected to provide the United States with a survivable and effective bomber force through the 1980's.

STRATEGIC MISSILES' PENETRABILITY

We have many reasons to believe that the Soviets are making a substantial effort to improve their anti-ballistic-missile capabilities. In support of our strategic arms limitation talks, we have studied the possibilities of product improvement to their SA–2 and SA–3 SAM systems to make them ABM capable. [Deleted.]

Because of our current lack of knowledge concerning exactly what the Soviets are doing in their terminal ABM R.D.T. & E. programs, we have examined what the United States might do that would be least

sensitive to any of the alternatives believed practical for the Soviets. We have concluded that a reentry vehicle that maneuvers to evade the ABM interceptor [deleted], coupled with appropriate exoatmospheric "pen aids," will provide the penetration system that is least sensitive to present and reasonable postulates of future Soviet terminal ABM defenses.

OCEAN CONTROL

Admiral Moorer has discussed in some depth the threat presented by the rapidly expanding Soviet naval forces and their air- and sea-launched antiship weapons. The Soviets have already demonstrated in [deleted] exercises their ability to conduct coordinated attacks involving aircraft, surface ships and submarines, and cruise missile systems against a simulated carrier task force. They have developed a good surface ocean-surveillance capability, [deleted] and an extensive command, control and communications network. Our capability to defend our fleet—in confined bodies of water such as the eastern Mediterranean—has not kept pace with the growth of this threat.

[Deleted]. Extensive changes in our own surface naval forces—including their tactics and offensive and defensive weapons—and in the types of ships themselves appear to be required, and your support for these developments is requested.

Chairman ELLENDER. [Deleted.]

Dr. FOSTER. [Deleted.]

SEA-LAUNCHED BALLISTIC MISSILES

The Soviets have expressed [deleted] interest in developing a strategic ASW force that can effectively locate, identify, and destroy our Polaris force, should they desire to.

[Deleted.]

Chairman ELLENDER. [Deleted.]

Dr. FOSTER. [Deleted.]

[Colloquy deleted.]

ULMS DEVELOPMENT

Dr. FOSTER. We have initiated the development of ULMS for two main reasons: (1) the Soviets' possible development of underseas surveillance and associated ASW systems that could progress more rapidly than our ability to develop and deploy new long-range missile systems and (2) the possible loss of overseas bases. In addition, active programs on improvements in sonar systems and submarine quieting are being pursued. The pursuit of ULMS and other programs should insure our continued confidence in the survival of our sea-based deterrent through the 1980's.

Chairman ELLENDER. What capabilities are you looking for in ULMS that you do not have in the Poseidon system?

Dr. FOSTER. Mr. Chairman, if I may, I would like to take a moment on that point. The great concern we have with the possibility of detecting a number of our Polaris submarines simultaneously has to do with the relatively small area in which they are forced to operate. [Deleted.]

The ULMS missile would have a considerably larger range. This would increase by about five times or more the area in which the Soviets would have to search for Polaris-type submarines.

In addition, we may lose the overseas bases from which they are currently deployed, and that would force us to take a couple of extra weeks just transiting to and from the patrol areas. If we can get missile ranges that will bring the submarines back to our coasts and into areas where we have naval craft that could assist them [deleted].

FOREIGN BASE ELIMINATION AND SUBMARINE VULNERABILITY REDUCTION

Chairman ELLENDER. Based on recent testimony on the ULMS program, I have about concluded that one of the principal reasons for going forward with the program is the fact that the ULMS submarines will not be dependent on foreign bases. Is this a correct conclusion?

Dr. FOSTER. I don't think it is the principal reason. I would combine the need for reduction in the vulnerability of the submarine with the possible loss of foreign bases. I don't put a special emphasis on one or the other. It is true we have very little control over the basing rights, but we also have very little control over the Soviet ASW program. We want to protect against both.

Chairman ELLENDER. As I say, I had about reached this conclusion based on the testimony to date. I know that some of the witnesses have raised the point of the possibility of the loss of our overseas bases.

Dr. FOSTER. I would not disagree with you, if you came to the conclusion from your vantage point that our greatest worry is the loss or potential loss of foreign bases—I could see that.

Senator YOUNG. I did not hear that.

Dr. FOSTER. The chairman, Senator Young, just expressed a concern over the possible loss of foreign bases and indicated that as a reason for the ULMS. Also, the lack of foreign basing is a strong argument for the use of carriers.

Chairman ELLENDER. I meant to indicate that the proponents put forth those points among their chief arguments.

Dr. FOSTER. Yes.

Senator YOUNG. Off the record.

(Discussion off the record.)

Dr. FOSTER. There are many other mission areas in which our military posture requires improvement if we are to retain a meaningful technological superiority in face-to-face engagement with the enemy. [Deleted.]

DIMINUTION OF U.S. TECHNOLOGICAL LEAD

We have reexamined the analysis of technological leadtime that I presented to you last year. We have applied this to comparable emerging military systems, not just to laboratory applied science. Considerable effort was given to trying to determine truly comparable Soviet/United States weapon systems, comparability in mission, and comparability in applied weapon-systems technology. Our reexamination shows that, in the aggregate, the United States enjoyed a 2-year technological lead over the Soviet Union in the early 1960's and that this lead has slowly decreased to roughly parity in many comparable systems in 1970.

These independently derived results, though somewhat more pessimistic, are in essential agreement with what I presented to you last year. A briefing of these investigations will be made available to this committee if desired. This reexamination, plus the results of the net technical assessments that I have just described, supports our concerns over the diminution of U.S. technological superiority over the Soviet Union.

Mr. Chairman, at the risk of repeating myself, I wish to emphasize again why I sometimes appear preoccupied with comparisons between our own developmental efforts and those of the Soviet Union. It is through these comparisons that we gain a major insight into possible threats to our future national security. We believe that we have a serious problem. Our determination to retain technological superiority in our operational forces must be revitalized. We are not asking you to outspend the Soviets, because that is not a realistic approach. We are asking you to grant increases in spending on specific programs that can help significantly to retain—or reestablish—our technological superiority in those mission areas that we consider to be the most crucial.

DEVELOPMENT DUPLICATION AND REDUNDANCY BY ALLIES

Chairman ELLENDER. Dr. Foster, in compiling these requests and in presenting this testimony, do you take into account our inability to secure the needed cooperation from our allies so that they would share in the defense of the free world? Are not your requests based on what you see as the total requirement, and since there is no one else to share the burden to any degree, you come to the Congress for funds that by right should, in part, be provided by other countries?

Dr. FOSTER. Mr. Chairman, I have considered very seriously this matter that you just mentioned. If we can take a moment, Mr. Chairman, I would like you to turn to page 2–17. There we have indicated a number of allies—United Kingdom, France, Germany, Holland, Italy, and so on, and we have also listed the areas where we need technological progress to improve our weapon systems—helicopters, light aircraft, trucks, tanks, tactical missiles, and so on. It is disturbing to find that each one of these countries is developing on its own so many of these different weapon systems. It is disturbing that the parliaments, the ministries of defense, the individual weapon developers, cannot somehow get along with less redundancy here. It just seems unnecessary.

However, having noticed this effort, I spent the last 2 years trying to work with our allies to avoid our starting new developments or their starting new developments, wherever another one of the partners seems to have an adequate development undeway. I plead for your support in this matter. There is a lot of unnecessary development.

Naturally, our services have been somewhat reluctant to accept the development of a foreign nation. I am not asking that we buy our equipment from foreign nations.

Chairman ELLENDER. But this should be a partnership, Dr. Foster. We should provide for our own defense, certainly, but it seems to me that you are taking the position that since our allies refuse to provide adequately for their own defense, we must do so.

Dr. FOSTER. Mr. Chairman, there was some reluctance. However, in the past 2 years, we have started a number of programs in which we look at the hardware being developed by other nations.

CONTRACTS WITH FOREIGN FIRMS

For example, last year the U.S. Army contracted with a French firm to deliver some ground surveillance radar called the RATAC. These were tested here in this country, and the Army was delighted with the product. They have now shipped units to Southeast Asia. Simultaneously, a U.S. firm has made arrangements with the French firm to produce these radars in this country for the U.S. Army.

Chairman ELLENDER. To be used where?

Dr. FOSTER. By U.S. forces. Mr. Chairman, I want to point out that in this way we avoided the necessity of our going through a development which, if successful, would have provided something for the inventory several years later than with this arrangement. I would hope we could do this with some of the surface-to-air systems.

Chairman ELLENDER. Who developed this?

Dr. FOSTER. The French Government.

Chairman ELLENDER. Why did we have to buy it?

Dr. FOSTER. For a small amount of money we buy licensing rights for production in the United States.

Chairman ELLENDER. You think that is right?

Dr. FOSTER. Yes, sir, I think it saves us money. And it saves us time. If we need it badly, we can put it in the inventory.

Chairman ELLENDER. But we need it for whose benefit?

Dr. FOSTER. To provide for our security as well as those in whose defense we send forces abroad.

SHARING BURDEN OF DEFENSE

Chairman ELLENDER. Of course, we gain time by doing what you describe. But the burden of defense among prosperous allies should be shared. Our economic difficulties today stem from the burden we have assumed for the past 25 years in defending the whole free world.

Dr. FOSTER. Mr. Chairman, there has been a burden on the backs of our European Allies also and I am not competent to judge whether that burden has been unduly light. But they have been able to recover from World War II, and they are now in a position to bear a greater share of the burden. In particular they now have a technology base in Europe that is almost as good as ours. They are certainly in a position to develop systems not only for the nations in Europe but also from time to time for the U.S. forces, and it is that kind of arrangement we are trying to effect.

You see it is a special problem for them, because while they can make the development within their budgets, they find that their own uses, their own production needs are not sufficiently large to warrant going into full production. They find it difficult to get their neighbors and others to accept the idea of procuring foreign weapons. We hope that by our acceptance of weapons developed by our partners we will begin to breakdown those barriers so the allied nations in Europe will share this development burden.

Chairman ELLENDER. I have been hearing that for 25 years now and it has never come to pass.

Dr. FOSTER. I have just given you one example and hope that next year we will be able to give you more. I believe it is worth the effort, but I am not so confident as to believe that in the next several years hundreds of millions of dollars each year will be saved. It is a longer term goal, but we intend to work at it.

JAPANESE LICENSED TO PRODUCE F–4

Senator YOUNG. Mr. Chairman. Dr Foster, on page 2–17 you list the production of various countries. Is Japan now making a fighter plane?

Dr. FOSTER. Yes, sir, the Japanese are licensed to produce the F–4. I don't know whether they have turned out the first ones.

TANK DEVELOPMENT

Senator YOUNG. Are they making their own tanks?

Dr. FOSTER. They recently completed development of some prototype tanks, and I am quite interested in taking a look at those.

Senator YOUNG. I would think it would be more incentive for them to increase military power of their own.

Dr. FOSTER. Yes; I think the situation has changed a great deal in the last few years.

Senator YOUNG. Off the record.

(Discussion off the record.)

RESEARCH AND DEVELOPMENT PROGRAM

Dr. FOSTER. The fiscal year 1973 research and development program that I will now describe is a critical step toward arresting the loss of our technological lead. It is aimed primarily at eliminating our assessed deficiencies in opposing systems, not at restoring total technological superiority in equivalent systems.

MAJOR BUDGET ITEMS

I would like to outline in general terms the reasons for the three-quarters of a billion dollars' increase in this year's budget request. Though many hundreds of projects contain compensating increases and decreases, the major thrust of our overall increase in emphasis is in the following areas.

Now, Mr. Chairman, as you look at that list you will see that the total adds up to almost $1 billion. It consists of a number of individual items, and with your permission I would like to take a moment to go through them.

The first item of $97 million represents an increase in the technology base. This is the relatively basic research work and the exploratory research work, which for fiscal 1972 ran about $1.4 billion. We are making a 6.9 percent increase of $97 million in that area.

We have increased the emphasis on our test and evaluation program. This $32 million increase is primarily to provide the opportunity for joint service tests.

SEA-BASED MISSILE PROGRAM

There is an increase of $413 million from the $187 million we had in fiscal year 1972 on the sea-based missile programs.

Chairman ELLENDER. These funds would further develop ULMS?

Dr. FOSTER. Yes, sir, the total requested for research and development on ULMS is $520 million. The increase this year over last year is $380 million—assuming approval of the fiscal year 1972 supplemental. This also provides for development of [deleted] I mentioned earlier.

Chairman ELLENDER. That is still in development?

Dr. FOSTER. Yes, sir. The ULMS program is in engineering development.

Chairman ELLENDER. What is included in there?

Dr. FOSTER. It includes procurement of the long-leadtime items for [deleted] the reactors and so on.

Chairman ELLENDER. Even though the development has not been completed.

Dr. FOSTER. Sir, I think there is some misunderstanding here. You see, we intend to use a reactor of the type [deleted].

To use that reactor [deleted] we need to place the orders for the long-lead components today if we are to have a ship at sea in 1978. The missile, will use technology quite similar to the Poseidon technology but a little more advanced, so we need money now to place orders for such components as motors that can go into tests to prove our technology is appropriate for those new motors.

In each case here, we have a fantastic record. Admiral Rickover and his team produced the Polaris submarines and the attack submarines over the years without failure, and Admiral Smith and his team produced the Polaris and Poseidon missiles.

With regard to each of those programs there were detractors who felt these people were taking too large steps and were running too much risk. I think those two leaders have proved without any doubt that they are as good as any the Nation has; they have nothing but successes on their records. In the ULMS program, there is nothing in the way of unnecessary concurrence.

Chairman ELLENDER. Once the Polaris program was completed, we started on the Poseidon program. Now that that is near completion, we plan to initiate the ULMS program, reasoning that such a weapon would obviate the need for foreign bases, in order to protect ourselves against a possible loss of such bases.

ULMS FUNDING

Senator YOUNG. Does this $380 million include a supplemental for ULMs?

Dr. FOSTER. Yes. That increase is based on the fiscal year 1972 budget including the fiscal year 1972 supplemental request for a total fiscal year 1972 ULMS R. & D. program of $140 million. I am trying to show you what the $1 billion increase of fiscal year 1973 over fiscal year 1972 represents—and I assume approval of the fiscal year 1972 supplemental request. Later I will show a quarter of a billion in major decreases. These collectively explain the chief reasons for a net increase of three-quarters of a billion dollars for fiscal 1973.

The $111 million represents an increase over 1972 for the strategic bomber and penetration aids, that is, the B–1 and SCAD.

Then you can see the smaller items that follow, leading to a total of about $1 billion. There are, of course, some significant compensating decreases from last year's budget which result primarily from major systems now past their peak of investment and funding requirements. The list of major decreases adds up to about a quarter of a billion dollars, the first being a $170-million decrease from last year, associated primarily with the S–3A aircraft, which now has had its first flight; the subsequent funding for this program will drop steadily.

CLOSE AIR SUPPORT

Chairman ELLENDER. Let me be sure I understand what you are saying. This list on page 1–24 that totals $997 million is the identification of areas where you are requesting substantial increases over the funds made available for fiscal year 1972. For instance the $40 million shown for "close air support" is the increase being requested for fiscal year 1973, for Cheyenne and A–X over what was provided for fiscal year 1972.

Dr. FOSTER. You are right, Mr. Chairman. What I attempted to do in this tabulation was to indicate some of the significant increases being requested by broad categories, rather than by specific projects.

Chairman ELLENDER. Now, the next listing is a comparable treatment of the significant decreases.

Dr. FOSTER. Yes, sir.

Chairman ELLENDER. I am clear now. Please proceed, Dr. Foster.

BUDGET REDUCTIONS

Dr. FOSTER. Then there are these decreases, and the first item of $170 million concerns the S–3A. ASW aircraft. It has passed its peak. You see last year we asked for $208 million for that program; this year the request is for roughly $37 million, so there is a reduction of $170 million this year. Minuteman III is phasing down, so there is a $27 million reduction there, a $40 million reduction in Safeguard development, and so on. These add up to a quarter of a billion dollars.

Chairman ELLENDER. When you say phasing down you mean in research and development?

Dr. FOSTER. Yes, sir; the development effort to prove out the Minuteman III is phasing down to a relatively low level now, and it is for that reason, of course, we have a reduction. We cannot simply come in and explain to the Congress that we are starting all these new important programs and therefore we have to add money. We also must make some reductions, because we finished some of the things for which we asked for money earlier.

Chairman ELLENDER. Does this mean that the Minuteman III has been developed to the point where you need no more research?

Dr. FOSTER. No, Mr. Chairman. There are still a number of development changes that need to be made. In fact, as long as we have a Minuteman missile in the field as part of our deterrent force, I think changes will be needed to keep it current, and viable. I don't see any end to that any more than there is an end to improving the B–52's as long as we depend on them as a first line of defense.

ASSUMED APPROVAL OF 1972 SUPPLEMENTAL

You will note that these increments and decrements are based on approval of the fiscal year 1972 supplemental request. The reasons for the urgency of that request are provided in the Secretary's statement accompanying its submittal.

As you probably realize, a negligible fraction of this fiscal year 1973 budget supports our forces in Southeast Asia. With the exception of minor programs to improve our continuing air-interdiction campaign, the R. & D. contribution to that war is complete. The savings in funds from those required to support the war in prior years have permitted a substantial increase in R.D.T. & E. programs that can be undertaken without increasing total expenditures.

R.D.T. & E. PROGRAM PRODUCTIVITY

I would like now to make a few points regarding the increasing productivity of R.D.T. & E. program. Some challenging problems in R.D.T. & E. management are produced by the conflicting pressures of our desire to keep expenditures down and the need to increase the rate of improvement of our overall defense potential in a fashion commensurate with rapid Soviet progress.

As you have recognized, this situation requires that we exert every possible effort to increase the overall productivity of our R.D.T. & E. efforts as a means of minimizing growth in the R.D.T. & E. budget. Among the accomplishments of the past year are the following:

We have decentralized and strengthened the authority and motivation of the services in managing their own programs, while redirecting OSD efforts to the problems of general planning, review, and guidance of the overall effort, through the use of area coordinating papers, technology coordinating papers, and development concept papers.

We have simplified the basic acquisition process by the elimination of half of the 125 directives and instructions governing weapon-systems acquisition.

We are shifting our major ongoing systems developments to a fly-before-buy basis to the maximum practical extent (see sec. 2.3).

Contracting procedures have been shifted away from total package procurement toward individual types that better reflect the risk involved. We are shifting contract emphasis from scheduling to achievement as the precursor of further funding, and we are insisting that all contract changes be fully priced out before they are approved.

An independent parametric cost analysis is now required on each major defense system at the key program decision points.

During this coming year, we intend to focus on the following:

Greater emphasis on assessing the present and anticipated threat to our capabilities through an expanded net technical assessment effort.

Greater emphasis on discrete programs to eliminate specific deficiencies identified by our mission-area assessments. I won't go through the rest of these details.

WEAPON SYSTEMS ACQUISITION

During the next year, we hope to make significant progress in the basic problem area of improving the weapon-systems acquisition process. We are following the Senate Armed Services Committee's hearings on this issue, and we welcome constructive suggestions from the Congress to help us in this difficult task.

Gentlemen, this completes the verbal portion of my statement. The remaining portions of the written statement expand upon this summary.

I would like to thank you very much for the opportunity to appear here before you today.

PROGRAM DOCUMENTATION

Chairman ELLENDER. Dr. Foster, the total request for R.D.T. & E. for fiscal year 1973 is about $8.6 billion, as follows: Army, $2.1 billion; Navy, $2.7 billion; Air Force, $3.2 billion; defense agencies, $0.5 billion; and $50 million for the Emergency Fund. As Director of Defense Research and Engineering, what authority do you exercise over the R. & D. budgets of the services, and how do you exercise this authority?

Dr. FOSTER. Mr. Chairman, we try to do it in the following way: Before any approval is given to start a major program, we write down very carefully why it is we need that new program. What is there that forces us to go from the present system that we are using sucessfully in the field to some new system? Why can't we just modify the present system? We carefully try to document the reasons surrounding the need for a new system.

Chairman ELLENDER. That is true of each of the services?

Dr. FOSTER. In each service for every major program we document this. We then describe all of the alternatives, with the pros and cons of taking alternative routes. Finally, having chosen one, we document the conditions under which we are to go forward and the characteristics of the weapon system, as well as the thresholds for performance. That is to say, unless the system has passed this or that test, unless it has this or that degree of performance, we do not proceed to the next phase of development. So when the program is turned on, it is by means of a contract between the Secretary of Defense and the service, and that contract is a signed document called the development concept paper. The service is then free to go out and execute the program, subject to the satisfaction of several milestones. These milestones occur every 6 months to a year, at which time the service will report that they have passed that milestone. And we will look to see whether or not they can document the fact that the system now performs properly, or the tests have been satisfactory, or the progress of the contract or order—with regard to schedule and financing and so on—is satisfactory. If not, we hold up the program.

MONITORING OF DEPLOYMENT AND OPERATION OF SYSTEM

Chairman ELLENDER. To what extent do you supervise these programs after you determine their feasibility?

Dr. FOSTER. Once the development is complete, the deployment of that system and its operation in the field are monitored by the Office for Installations and Logistics.

Chairman ELLENDER. That is under whom?

Dr. FOSTER. The Assistant Secretary of Defense for Installations and Logistics, Mr. Shillito.

The individual service effects the deployment and operations and monitoring. As to whether or not the weapon system performs and the maintenance and operations are satisfactory—that determination is performed by the Assistant Secretary of Defense for Installations and Logistics.

Chairman ELLENDER. Senator Young?

REESTABLISHMENT OF UNIVERSITY PROGRAM: 1972 SENATE REPORT

Senator YOUNG. I would like to say, Dr. Foster, the Committee on Appropriations of the Senate requested the Department of Defense to reestablish the university program. The committee stated in its report:

> It is the view of the committee that the Department of Defense should take immediate action to reestablish the university program in order that many excellent institutions, many of which are small institutions who have not been receiving any research and development funds from the Department of Defense, may be given an opportunity to compete for these funds. Furthermore, the committee urges that the Department include adequate funds for a university program in its budget for fiscal 1974 if calendar year 1973 request for R. & D. appropriations do not include specific funds for the university programs.

This committee requested the Department of Defense to include funds in the 1973 budget requests for reestablishment of the university program. Has this been done?

Dr. FOSTER. Senator Young, I reported on that in the initial portion of the statement. There is more detail in section 5 of the statement. We desire to broaden our technological base in the university relating to military areas of interest.

PROJECT THEMIS: 1970 CONGRESSIONAL DISALLOWANCE OF FUNDS

We started a program, you will recall, in 1966 as Project Themis, and each year added 20 new universities while sustaining the worthy ones from prior years. In 1970, the Congress canceled these efforts by not approving the money requested. Some of the Themis programs are still being supported in the services through their regular research programs—and I am very grateful for that. With the $100 million increase in this relatively basic and exploratory money that we are asking for this year, we hope to continue to broaden our university research base.

Senator YOUNG. For the smaller schools?

Dr. FOSTER. Yes, they are included.

Senator YOUNG. For a program like Themis?

Dr. FOSTER. Yes, but within our regular program. You will recall what we did before. We asked all universities to make submittals. Then we arranged them in order of excellence. Then we drew a line dividing those that were either as good as or better than, those efforts we already had underway in universities, from those that were not as

good. We rejected requests from the bottom portion and devoted our full effort to concentrating on the top ones.

We took all of those that were judged acceptable on the basis of excellence and readjusted them in order to give those that had the least funding from DOD the first priority. We would like to continue with a similar approach; however, rather than have a special line item, we would do it as part of the regular program.

Senator YOUNG. How much money is allocated to this Themis type program for universities?

Dr. FOSTER. We estimate that about $15 million of our R.D.T. & E. funds may support worthy proposals of this type.

Senator YOUNG. How does that compare with the funds provided last year and the year before?

Dr. FOSTER. Last year it was essentially zero, since the Congress did not authorize moneys specifically for Themis. Fiscal year 1970 was the last year that such money was authorized. Consequently, the Themis money ran out over a period of 2 or 3 years. Those programs that were maintained were supported by individual services in their regular programs. We would like to continue to enhance the efforts underway in some of the smaller universities where they have excellent research ideas. We estimate that something like $15 million might be spent at smaller universities from the total funds being requested.

Senator YOUNG. That is somewhat encouraging for this is a very valuable program. Is this program proposed by the Army, Navy, and Air Force getting support?

Dr. FOSTER. I would not say the services had an overwhelming enthusiasm for the Themis program. I think they were a little reluctant. There is a lot of additional work involved in searching out new investigators at small schools and leading them through the complicated process of getting Government contracts. It is much easier to go to larger, well-established universities and to continue with prior programs, augmenting them as money becomes available.

Senator YOUNG. It is hard to understand why they want to continue to provide funds for universities that won't even permit ROTC programs at the schools.

Dr. FOSTER. I want to assure you, Senator Young, that the services are as concerned about that particular development as you are.

PROGRAM TALENT RECRUITMENT

Senator YOUNG. Would you explain in detail how you plan to search for innovative high quality research talent at institutions which have little or no participation in Defense research?

Dr. FOSTER. Yes; I have a program submitted by my Deputy for Research and Advanced Technology and I would be pleased to put that in the record at this point.

(The information follows:)

UNIVERSITY PROGRAM

Purpose

The purpose of this new initiative is to search for innovative talent, particularly among rapidly developing schools and state colleges that have had little or no previous participation in defense research.

Background

The Senate Appropriations Committee Report on the Department of Defense Appropriations Bill, 1972, commented upon DoD's failure to continue the University Program (Project THEMIS) and urged DoD to restore this program, and to include adequate funds for a "University Program" in its budget for fiscal year 1973.

Project THEMIS was started in January 1967 to respond to Congressional demands for wider distribution of Federal research funds to universities and colleges which resulted in a memorandum request by President Johnson to all Federal agencies for responsive action.

As originally planned, it was expected that between 40 and 50 new THEMIS efforts would be initiated each year for 4 years at a cost of approximately $200,000 per effort, per year. This was never achieved. What was achieved was the initiation of 118 THEMIS efforts at 78 universities in 41 states and the District of Columbia.

THEMIS funding

Fiscal year:	*Millions*
1967	$19.2
1968	28.2
1969	28.5
1970	12.4
1971	6.0

The universities responded with the submission of 1,087 proposals to compete for the 118 contracts. Services are now continuing support of approximately 38 of the THEMIS centers in their regular research program.

In fiscal year 1970, the Senate Armed Services Committee regarded Project THEMIS as an educational support program and, thus, inappropriate for DoD funding. Section 203 of Public Law 91–121, authorizing appropriations for military weapons and equipment and also for research, development, test, and evaluation for fiscal year 1970, provided that: "None of the funds by this Act may be used to carry out any research project or study unless such a project or study has a direct or apparent relationship to a specific military function or operation." Similar wording was contained in Section 204 of the fiscal year 1971 Appropriations Bill. As a result of these actions and major funding reductions in the Defense Research Program, Project THEMIS as a line item was terminated. THEMIS programs that could compete with the regular research programs were retained.

Initiative

The National Science Foundation reports that there were 233 civilian colleges and universities in the United States that awarded Doctor's degrees in science and engineering in 1970.

Although DoD currently has individual contracts or grants at over 200 of these institutions, many scientific and engineering departments are not represented. Among these are departments, particularly at growing smaller colleges and universities, which in recent years have hired bright young scientists and engineers with ideas and concepts of potential value to defense. The purpose of this initiative is to make additional efforts to ensure that these scientists and engineers have an opportunity to participate in the Defense Research Program.

This will be accomplished through a visitation program by Defense scientists who will provide the schools with information concerning current DoD scientific problems, brochures describing the contract and grant research program, major technological areas of DoD interest, and specific details as to how to submit proposals for contract support.

The Navy has an ongoing program. Last year its scientists and engineers visited about 150 college and university departments that in the past have had no, or little, participation in Defense research. Army and Air Force research offices will be asked to adopt similar means to broaden the base of their Defense Research Program.

Restrictions

Current Public Law prevents DoD from establishing special educational development programs with all of the objectives of Project THEMIS.

Support of research contracts or grants under this new initiative will be determined by the excellence of the proposed research and its match with relevant research requirements of the Department of Defense.

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Chairman ELLENDER. In connection with the university program, I note that during fiscal year year 1971 the Department of Defense awarded 365 prime contracts for research and development work to U.S. educational and nonprofit organizations, U.S. Government agencies, and foreign institutions and governments. These contracts total $625 million, and a comparable figure for fiscal year 1970 was $655 million. I will include in the record at this point a listing of these contracts by the various types of organizations.

(The information follows:)

EDUCATIONAL AND NONPROFIT INSTITUTIONS
RECEIVING PRIME CONTRACT AWARDS OF $10,000 OR MORE FOR
RESEARCH, DEVELOPMENT, TEST AND EVALUATION WORK

Fiscal Year 1971

Department of Defense prime contracts totalling $625 million were awarded to 365 educational and other nonprofit institutions in fiscal year 1971 for research, development, test and evaluation work. Of this total, $603 million was awarded to 307 institutions in the United States, $14 million to 13 U. S. Government agencies, and $8 million to 45 foreign institutions and government agencies. These figures compare with similar data for fiscal year 1970 as follows:

Type of Institution	Fiscal Year 1970 Number	1970 Amount (Millions)	1971 Number	1971 Amount (Millions)
U. S. Institutions				
Educational	193	$356	187	$336
Other Nonprofit	132	278	120	267
Subtotal	325	634	307	603
U. S. Government Agencies	13	9	13	14
Foreign Institutions and Government Agencies	49	12	45	8
Total	387	$655	365	$625

There are three sections in this report. The first section lists 187 educational and 120 other nonprofit institutions in the U. S. The second section lists the 13 U. S. Government agencies, and the third section lists the 45 foreign institutions and government agencies.

The locations shown are those where the work was expected to be performed. Generally, the location is an institution's laboratory or other facility. However, if the work was scheduled to be performed at a Defense activity, such as an Air Force Base, the location is the Defense activity rather than the institution's facility. The dollar amounts shown include only contract awards for RDT&E work. They exclude any other services, such as training services, or any supplies furnished by these contractors.

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FISCAL YEAR 1971

PART I - U.S. INSTITUTIONS

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
AEROSPACE CORP		71,101 *
EL SEGUNDO	CALIFORNIA	71,101
AKRON UNIVERSITY OF		52 *
AKRON	OHIO	52
ALABAMA UNIVERSITY OF		764 *
BIRMINGHAM	ALABAMA	311
HUNTSVILLE	ALABAMA	395
UNIVERSITY	ALABAMA	58
ALASKA UNIVERSITY OF		2,340 *
COLLEGE VILLAG	ALASKA	2,303
FAIRBANKS CITY	ALASKA	37
ALBUQUERQUE UNIVERSITY OF		24 *
ALBUQUERQUE	NEW MEXICO	24
AMERICAN DENTAL ASSOCIATION		41 *
CHICAGO	ILLINOIS	41
AMERICAN FOUNDATION BIOLOGICAL		99 *
ROCKVILLE	MARYLAND	99
AMERICAN INSTITUTE BIOLOGICAL		159 *
WASHINGTON	DC	159
AMERICAN INSTITUTE FOR RESEARCH		2,366 *
	KOREA	190
	RYUKYU IS	93
	THAILAND	179
ARLINGTON	VIRGINIA	13
BEDFORD	MASS	89
KENSINGTON	MARYLAND	1,119
SILVER SPRING	MARYLAND	614
PITTSBURGH	PA	69
AMERICAN SOCIETY FOR ENGINEERING		37-*
WASHINGTON	DC	37-
AMERICAN STATISTICAL ASSN		10 *
WASHINGTON	DC	10
AMERICAN UNIVERSITY		1,365 *
WASHINGTON	DC	1,365
ANALYTIC SERVICES INC		2,256 *
FALLS CHURCH	VIRGINIA	2,256
ARCTIC INSTITUTE OF NORTH AMERICA		273 *
WASHINGTON	DC	273
ARIZONA STATE UNIVERSITY		218 *
TEMPE	ARIZONA	218
ARIZONA UNIVERSITY OF		2,994 *
IGLOO MARYS IG	ALASKA	150
TUCSON	ARIZONA	2,844
ATHENS COLLEGE		32 *
ATHENS	ALABAMA	32
AUBURN UNIVERSITY		480 *
AUBURN	ALABAMA	480
BABIES HOSPITAL RESEARCH CENTER		70 *
WILMINGTON	NCAR	70
BATTELLE MEMORIAL INSTITUTE		8,350 *
CANTON	OHIO	137
COLUMBUS	OHIO	7,335
RICHLAND	WASHINGTON	623
WRIGHT PATTERS	OHIO	255
BAYLOR UNIVERSITY		159 *
HOUSTON	TEXAS	159
BELLARMINE COLLEGE		32 *
LOUISVILLE	KENTUCKY	32
BETH ISRAEL HOSPITAL		142 *
BOSTON	MASS	31
NEW YORK	NEW YORK	111
BLOOD RESEARCH INSTITUTE INC		30 *
BOSTON	MASS	30
BOSTON COLLEGE		1,217 *
CHESTNUT HILL	MASS	1,061
WESTON	MASS	156
BOSTON UNIVERSITY		249 *
BOSTON	MASS	249
BRIGHAM YOUNG UNIVERSITY		113 *
PROVO	UTAH	113
BROOKLYN CUMBERLAND MEDICAL CENTER		11-*
BROOKLYN	NEW YORK	11-
BROOKLYN POLYTECHNIC INSTITUTE OF		1,549 *
BROOKLYN	NEW YORK	1,293
FORT MONMOUTH	NEW JERSEY	28
FARMINGDALE	NEW YORK	228
BROWN UNIVERSITY		878 *
PROVIDENCE	RI	878
BRYN MAWR HOSPITAL		38 *
BRYN MAWR	PA	38
CALIFORNIA INSTITUTE OF TECHNOLOGY		1,190 *
PASADENA	CALIFORNIA	1,190
CALIFORNIA STATE OF		19 *
BERKELEY	CALIFORNIA	19
CALIF STATE POLYTECHNIC COLLEGE		12 *
POMONA	CALIFORNIA	12
CALIFORNIA UNIVERSITY OF		18,727 *
BERKELEY	CALIFORNIA	4,023
DAVIS	CALIFORNIA	70
IRVINE	CALIFORNIA	153
LA JOLLA	CALIFORNIA	8,684
LOS ANGELES	CALIFORNIA	3,037
RIVERSIDE	CALIFORNIA	50
SAN DIEGO	CALIFORNIA	1,722
SAN FRANCISCO	CALIFORNIA	310
SANTA BARBARA	CALIFORNIA	655
SANTA CRUZ	CALIFORNIA	23
CALVIN COLLEGE		24 *
GRAND RAPIDS	MICHIGAN	24
CARNEGIE MELLON UNIVERSITY		2,173 *
MANZ STAT	CALIFORNIA	183
PITTSBURGH	PA	1,990
CARNEGIE INSTITUTION OF WASHINGTON		18 *
WASHINGTON	DC	18
CASE WESTERN RESERVE UNIVERSITY		940 *
CLEVELAND	OHIO	940

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
CATHOLIC UNIVERSITY OF AMERICA		628 *
WASHINGTON	DC	628
CHESAPEAKE COLLEGE		13 *
CENTREVILLE	MARYLAND	13
CHICAGO MEDICAL SCHOOL		15 *
CHICAGO	ILLINOIS	15
CHICAGO UNIVERSITY		874 *
CHICAGO	ILLINOIS	874
CHILDRENS CANCER RESEARCH		101 *
BOSTON	MASS	101
CHILDRENS HOSPITAL RESEARCH FOUND		136 *
WASHINGTON	DC	136
CHILDRENS MEMORIAL HOSPITAL		65 *
CHICAGO	ILLINOIS	65
CINCINNATI UNIVERSITY OF		825 *
CINCINNATI	OHIO	560
WRIGHT PATTERS	OHIO	265
CITY OF HOPE MEDICAL CENTER		71 *
DUARTE	CALIFORNIA	71
CITY UNIV OF NEW YORK RSCH FOUND		20 *
NEW YORK	NEW YORK	20
CITY UNIVERSITY OF NEW YORK		28 *
NEW YORK	NEW YORK	28
CLARKSON COLLEGE OF TECHNOLOGY		99 *
POTSDAM	NEW YORK	99
CLEMSON UNIVERSITY		145 *
CLEMSON	SCAR	145
COLORADO STATE UNIVERSITY		683 *
FORT COLLINS	COLORADO	683
COLORADO UNIVERSITY		795 *
BOULDER	COLORADO	455
DENVER	COLORADO	340
COLUMBIA UNIVERSITY		3,709 *
NEW YORK	NEW YORK	3,684
PALISADES	NEW YORK	25
COMMUNITY BLOOD COUNCIL OF NY INC		15 *
NEW YORK	NEW YORK	15
CONNECTICUT COLLEGE		49 *
NEW LONDON	CONN	49
CONNECTICUT UNIVERSITY OF		330 *
HARTFORD	CONN	19
STORRS	CONN	311
COORDINATING RESEARCH COUNCIL INC		107 *
NEW YORK	NEW YORK	107
CORNELL AERONAUTICAL LABR INC		20,670 *
BEDFORD	MASS	2,499
BUFFALO	NEW YORK	16,977
EDWARDS	CALIFORNIA	94
WRIGHT PATTERS	OHIO	1,100
CORNELL UNIVERSITY		2,805 *
ITHACA	NEW YORK	2,663
NEW YORK	NEW YORK	142
DARTMOUTH COLLEGE		81 *
HANOVER	NH	81
DAYTON UNIVERSITY OF		3,954 *
DAYTON	OHIO	2,638
WRIGHT PATTERS	OHIO	1,316
DELAWARE UNIVERSITY OF		260 *
NEWARK	DELAWARE	260
DENVER CITY OF		65 *
DENVER	COLORADO	65
DENVER UNIVERSITY OF		1,882 *
DENVER	COLORADO	1,882
DEPARTMENT OF HEALTH & HOSPITL.INC		44 *
BOSTON	MASS	44
DETROIT UNIVERSITY OF		42 *
DETROIT	MICHIGAN	42
DREXEL INSTITUTE TECHNOLOGY		303 *
PHILADELPHIA	PA	303
DUKE UNIVERSITY		4,080 *
DURHAM	NCAR	4,080
EASTMAN DENTAL DISPENSARY		33 *
ROCHESTER	NEW YORK	33
EDUCATIONAL TESTING SERVICE		264 *
PRINCETON	NEW JERSEY	264
EINSTEIN ALBERT MEDICAL CENTER		54 *
PHILADELPHIA	PA	54
EMMANUEL COLLEGE		475 *
BOSTON	MASS	479
EMORY UNIVERSITY		82 *
ATLANTA	GEORGIA	82
ERIE COUNTY RESEARCH FOR HEALTH		34 *
BUFFALO	NEW YORK	34
EYE RESEARCH FOUND OF BETHESDA		38 *
BETHESDA	MARYLAND	38
FACTORY MUTUAL RESEARCH CORP		81 *
NORWOOD	MASS	81
FAR WEST LAB FOR EDUC RES & DEV		40 *
BERKELEY	CALIFORNIA	40
FEDERATION OF AMERICAN SOCIETY		130 *
BETHESDA	MARYLAND	130
FELS RESEARCH INSTITUTE		51 *
WRIGHT PATTERS	OHIO	51
FLORIDA ATLANTIC UNIVERSITY		46 *
BOCA RATON	FLORIDA	46
FLORIDA INSTITUTE OF TECHNOLOGY		47 *
MELBOURNE	FLORIDA	47

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
FLORIDA STATE UNIVERSITY		511 *
TALLAHASSEE	FLORIDA	511
FLORIDA TECHNOLOGICAL UNIVERSITY		60 *
ORLANDO	FLORIDA	60
FLORIDA UNIVERSITY		806 *
GAINESVILLE	FLORIDA	806
FRANKLIN INSTITUTE OF PENNSYLVANIA		611 *
PHILADELPHIA	PA	601
SWARTHMORE	PA	10
GEOPHYSICAL INSTITUTE OF ALASKA		13 *
COLLEGE VILLAG	ALASKA	13
GEORGE WASHINGTON UNIVERSITY		1,303 *
WASHINGTON	DC	1,303
GEORGETOWN UNIVERSITY		395 *
WASHINGTON	DC	395
GEORGIA INSTITUTE TECH		916 *
ATLANTA	GEORGIA	916
GEORGIA STATE COLLEGE		27 *
ATLANTA	GEORGIA	27
GEORGIA TECH RESEARCH INSTITUTE		1,084 *
ATLANTA	GEORGIA	1,084
GEORGIA UNIVERSITY OF		216 *
ATHENS	GEORGIA	216
HAHNEMANN MEDICAL COLLEGE & HOSPIT		247 *
PHILADELPHIA	PA	247
HARVARD UNIVERSITY		2,636 *
BOSTON	MASS	191
CAMBRIDGE	MASS	2,325
FORT DAVIS	TEXAS	120
HAWAII UNIVERSITY OF		1,846 *
HONOLULU CITY	HAWAII	1,846
HEALTH RESEARCH INC		14 *
BUFFALO	NEW YORK	14
HEKTOEN INSTITUTE FOR MEDICAL RSCH		21-*
CHICAGO	ILLINOIS	21-
HERNER CO		525 *
WASHINGTON	DC	525
HOUSTON RESEARCH INSTITUTE INC		18 *
HOUSTON	TEXAS	18
HOUSTON UNIVERSITY OF		168 *
HOUSTON	TEXAS	168
HUDSON INSTITUTE		543 *
CROTON ON HUDS	NEW YORK	543
HUMAN RESOURCES RESEARCH ORGN		3,814 *
ALEXANDRIA	VIRGINIA	3,814
HUMAN SCIENCES RESEARCH INC		504 *
MCLEAN	VIRGINIA	504
I I T RESEARCH INSTITUTE		11,196 *
ANNAPOLIS	MARYLAND	5,745
CHICAGO	ILLINOIS	5,451

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
IDAHO UNIVERSITY OF		83 *
MOSCOW	IDAHO	83
ILLINOIS INSTITUTE TECHNOLOGY		626 *
CHICAGO	ILLINOIS	626
ILLINOIS UNIVERSITY OF		12,950 *
CHICAGO	ILLINOIS	394
NORMAL	ILLINOIS	24
URBANA	ILLINOIS	12,532
INDIANA UNIVERSITY		88 *
BLOOMINGTON	INDIANA	88
INSTITUTE FOR DEFENSE ANALYSIS		12,500 *
WASHINGTON	DC	1,906
ARLINGTON	VIRGINIA	10,594
INSTITUTE FOR RESEARCH INC		21 *
STATE COLLEGE	PA	21
INSTITUTE OF MEDICAL SCIENCES		13 *
SAN FRANCISCO	CALIFORNIA	13
IOWA STATE UNIV OF SCIENCE & TECH		531 *
AMES	IOWA	531
IOWA UNIVERSITY OF		924 *
IOWA CITY	IOWA	924
JEFFERSON MEDICAL COLLEGE		85 *
PHILADELPHIA	PA	85
JEWISH HOSPITAL OF ST LOUIS		74 *
ST LOUIS	MISSOURI	74
JOHN CARROLL UNIVERSITY		35 *
CLEVELAND	OHIO	35
JOHNS HOPKINS UNIVERSITY		70,579 *
BALTIMORE	MARYLAND	1,412
SILVER SPRING	MARYLAND	69,167
KANSAS STATE UNIVERSITY OF AGR		133 *
MANHATTAN	KANSAS	133
KANSAS UNIVERSITY OF		122 *
KANSAS CITY	KANSAS	11
LAWRENCE	KANSAS	111
KENT STATE UNIVERSITY		200 *
KENT	OHIO	200
KENTUCKY UNIVERSITY OF		616 *
LEXINGTON	KENTUCKY	616
LAB FOR COMPARATIVE BIOCHEMISTRY		50 *
SAN DIEGO	CALIFORNIA	50
LANKENAU HOSPITAL		20 *
PHILADELPHIA	PA	20
LATTER DAY SAINTS HOSPITAL		35 *
SALT LAKE CITY	UTAH	35
LEHIGH UNIVERSITY		712 *
BETHLEHEM	PA	712
LENOX HILL HOSPITAL		21 *
NEW YORK	NEW YORK	21

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
LIGHTNING & TRANSIENTS RESRCH INST		40 *
MINNEAPOLIS	MINNESOTA	40
LINFIELD RESEARCH INSTITUTE INC		81 *
MCMINNVILLE	OREGON	81
LONG BEACH STATE COLLEGE FOUND		53 *
LONG BEACH	CALIFORNIA	53
LOS ANGELES STATE COLLEGE		30 *
LOS ANGELES	CALIFORNIA	30
LOUISIANA STATE UNIVERSITY OF		897 *
BATON ROUGE	LOUISIANA	699
NEW ORLEANS	LOUISIANA	198
LOUISVILLE UNIVERSITY OF		213 *
LOUISVILLE	KENTUCKY	213
LOVELACE FOUNDATION		566 *
ALBUQUERQUE	NEW MEXICO	566
LOWELL TECH INSTITUTE		354 *
BILLERICA	MASS	48
LOWELL	MASS	306
LOYOLA UNIVERSITY		41 *
HINES	ILLINOIS	41
MAINE UNIVERSITY OF		10 *
ORONO	MAINE	10
MANHATTAN COLLEGE		16 *
BRONX	NEW YORK	16
MARINE BIOSCIENCE LABORATORY		35 *
SANTA BARBARA	CALIFORNIA	35
MARQUETTE UNIVERSITY		61 *
MILWAUKEE	WISCONSIN	61
MARYLAND UNIVERSITY OF		1,876 *
BALTIMORE	MARYLAND	679
COLLEGE PARK	MARYLAND	1,197
MASSACHUSETTS GENERAL HOSPITAL		55 *
BOSTON	MASS	55
MASSACHUSETTS INSTITUTE TECHNOLOGY		90,224 *
CHERRYFIELD	MAINE	19
CAMBRIDGE	MASS	35,099
LEXINGTON	MASS	55,106
MASSACHUSETTS UNIVERSITY OF		321 *
AMHERST	MASS	321
MAYO FOUNDATION		127 *
ROCHESTER	MINNESOTA	127
MEDICAL COLLEGE OF WISCONSIN		43 *
MILWAUKEE	WISCONSIN	43
MEDICAL COLLEGE OF SOUTH CAROLINA		174 *
CHARLESTON	SCAR	174
MEDICAL COLLEGE OF VIRGINIA		242 *
RICHMOND	VIRGINIA	242
MEMPHIS STATE UNIVERSITY		144 *
MEMPHIS	TENNESSEE	144
MENTAL RESEARCH INSTITUTE		18 *
PALO ALTO	CALIFORNIA	18
MERCK & CO INC		302 *
RAHWAY	NEW JERSEY	302
MIAMI UNIVERSITY		226 *
OXFORD	OHIO	215
WRIGHT PATTERS	OHIO	11
MIAMI UNIVERSITY OF		2,331 *
APOPKA	FLORIDA	11
CORAL GABLES	FLORIDA	748
MIAMI	FLORIDA	1,572
MICHIGAN COLLEGE OSTEOPATHIC MEDIC		29 *
PONTIAC	MICHIGAN	29
MICHIGAN STATE DEPT MENTAL HEALTH		35 *
AUGUSTA	MICHIGAN	35
MICHIGAN STATE UNIVERSITY		207 *
EAST LANSING	MICHIGAN	194
LANSING	MICHIGAN	13
MICHIGAN TECHNOLOGICAL UNIVERSITY		42 *
HOUGHTON	MICHIGAN	42
MICHIGAN UNIVERSITY OF		6,889 *
ANN ARBOR	MICHIGAN	5,300
WILLOW RUN	MICHIGAN	1,547
YPSILANTI	MICHIGAN	42
MIDWEST RESEARCH INSTITUTE		1,254 *
KANSAS CITY	MISSOURI	847
LAKESIDE	OHIO	37
WRIGHT PATTERS	OHIO	370
MILITARY OPERATIONS RESEARCH SOC		35 *
ALEXANDRIA	VIRGINIA	35
MINNESOTA UNIVERSITY OF		1,326 *
AUSTIN	MINNESOTA	33
DULUTH	MINNESOTA	23
MINNEAPOLIS	MINNESOTA	1,270
MISSISSIPPI STATE UNIVERSITY		44 *
STATE COLLEGE	MISS	44
MISSISSIPPI UNIVERSITY OF		49 *
UNIVERSITY	MISS	49
MISSOURI UNIVERSITY OF		536 *
COLUMBIA	MISSOURI	391
KANSAS CITY	MISSOURI	12-
ROLLA	MISSOURI	157
MITRE CORP		34,857 *
WASHINGTON	DC	1,360
BEDFORD	MASS	26,121
TUCSON	ARIZONA	747
HUNTSVILLE	ALABAMA	553
MCLEAN	VIRGINIA	5,772
FORT HOOD	TEXAS	95
HOUSTON	TEXAS	209
MONMOUTH COLLEGE		20 *
WEST LONG BRAN	NEW JERSEY	20
MONTANA STATE UNIVERSITY		62 *
BOZEMAN	MONTANA	62

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
MONTEFIORE HOSPITAL MEDICAL CENTER		44 *
NEW YORK	NEW YORK	44
MOTE MARINE LABORATORY		72 *
SARASOTA	FLORIDA	72
MOUNT SINAI HOSPITAL		106 *
NEW YORK	NEW YORK	106
NATIONAL SOCIETY PROFESSIONAL ENGR		246 *
WASHINGTON	DC	246
NEBRASKA UNIVERSITY OF		36 *
LINCOLN	NEBRASKA	36
NEVADA UNIVERSITY OF		173 *
RENO	NEVADA	173
NEW ENGLAND INSTITUTE MEDICAL RSCH		30 *
RIDGEFIELD	CONN	30
NEW HAMPSHIRE UNIVERSITY OF		37 *
DURHAM	NH	37
NEW MEXICO HEALTH & SOCIAL DEPT		73 *
SANTA FE	NEW MEXICO	73
NEW MEXICO INSTITUTE MINING & TECH		676 *
KIRTLAND AFB	NEW MEXICO	89
SOCORRO	NEW MEXICO	587
NEW MEXICO STATE UNIVERSITY		4,186 *
ALAMOGORDO	NEW MEXICO	16
LAS CRUCES	NEW MEXICO	2,084
UNIVERSITY PAR	NEW MEXICO	220
WHITE SANDS MS	NEW MEXICO	1,866
NEW MEXICO UNIVERSITY OF		1,442 *
ALAMOGORDO	NEW MEXICO	81
ALBUQUERQUE	NEW MEXICO	711
SANDIA	NEW MEXICO	650
NEW YORK MEDICAL COLLEGE		127 *
NEW YORK	NEW YORK	127
NEW YORK STATE UNIV RESEARCH FOUND		635 *
ALBANY	NEW YORK	620
BUFFALO	NEW YORK	15
NEW YORK STATE UNIVERSITY OF		431 *
ALBANY	NEW YORK	29
BROCKPORT	NEW YORK	21
BUFFALO	NEW YORK	275
NEW YORK	NEW YORK	57
STONY BROOK	NEW YORK	24
SYRACUSE	NEW YORK	25
NEW YORK UNIVERSITY		1,513 *
ANTWERP	NEW YORK	30
BRONX	NEW YORK	283
NEW YORK	NEW YORK	1,110
UNIVERSITY HIG	NEW YORK	90
NEW YORK ZOOLOGICAL SOCIETY		20 *
BROOKLYN	NEW YORK	20
NEWARK COLLEGE OF ENGINEERING		25 *
NEWARK	NEW JERSEY	25
NORTH CAROLINA STATE UNIVERSITY		221 *
RALEIGH	NCAR	221
NORTH CAROLINA UNIVERSITY OF		792 *
CHAPEL HILL	NCAR	792
NORTH DAKOTA STATE UNIVERSITY		144 *
FARGO	NDAK	144
NORTH DAKOTA UNIVERSITY OF		250 *
GRAND FORKS	NDAK	250
NORTH TEXAS STATE UNIVERSITY		21 *
DENTON	TEXAS	21
NORTHEASTERN UNIVERSITY		798 *
BOSTON	MASS	798
NORTHWESTERN UNIVERSITY		855 *
EVANSTON	ILLINOIS	855
NOTRE DAME UNIVERSITY OF		245 *
NOTRE DAME	INDIANA	245
NOVA UNIVERSITY OF ADVANCED TECH		100 *
FORT LAUDERDAL	FLORIDA	100
OHIO STATE OF		40 *
COLUMBUS	OHIO	40
OHIO STATE UNIVERSITY THE		78 *
CLEVELAND	OHIO	40
COLUMBUS	OHIO	38
OHIO STATE UNIV RESERCH FOUNDATION		2,668 *
COLUMBUS	OHIO	2,745
WRIGHT PATTERS	OHIO	77-
OHIO UNIVERSITY		198 *
ATHENS	OHIO	169
DAYTON	OHIO	29
OKLAHOMA MEDICAL RESEARCH FOUNDATN		153 *
OKLAHOMA CITY	OKLAHOMA	153
OKLAHOMA STATE BOARD PUBLIC AFFAIR		15-*
OKLAHOMA CITY	OKLAHOMA	15-
OKLAHOMA STATE UNIVERSITY OF		1,296 *
STILLWATER	OKLAHOMA	1,296
OKLAHOMA UNIVERSITY OF		344 *
FORT SILL	OKLAHOMA	177
NORMAN	OKLAHOMA	82
OKLAHOMA CITY	OKLAHOMA	85
OLD DOMINION COLLEGE		17 *
NORFOLK	VIRGINIA	17
OREGON GRADUATE CTR FOR STUDY RES		70 *
BEAVERTON	OREGON	20
PORTLAND	OREGON	50
OREGON STATE UNIVERSITY		1,207 *
CORVALLIS	OREGON	1,207
OREGON UNIVERSITY OF		364 *
EUGENE	OREGON	201
PORTLAND	OREGON	163
PACIFIC UNIVERSITY OF THE		26 *
SAN FRANCISCO	CALIFORNIA	26

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
PALISADES INSTITUTE		380 *
NEW YORK	NEW YORK	380
PALISADES GEOPHYSICAL INSTITUTE		1,453 *
BLAUVELT	NEW YORK	1,453
PASADENA FOUNDATION MEDICAL RSCH		45 *
PASADENA	CALIFORNIA	45
PENNSYLVANIA HOSPITAL CONTRIBUTORS		65 *
PHILADELPHIA	PA	65
PENNSYLVANIA STATE UNIVERSITY		8,414 *
STATE COLLEGE	PA	23
UNIVERSITY PAR	PA	8,391
PENNSYLVANIA UNIVERSITY OF		2,663 *
PHILADELPHIA	PA	2,663
PETER BENT BRIGHAM HOSPITAL		29 *
BOSTON	MASS	29
PHILADELPHIA CHILDRENS HOSPITAL		21 *
PHILADELPHIA	PA	21
PHILADELPHIA GENERAL HOSPITAL		99 *
PHILADELPHIA	PA	99
PITTSBURGH UNIVERSITY OF		541 *
PITTSBURGH	PA	541
PRESBYTERIAN HOSPITAL		165 *
CHICAGO	ILLINOIS	165
PRINCETON UNIVERSITY		1,909 *
	FOREIGN	42
PRINCETON	NEW JERSEY	1,867
PUERTO RICO UNIVERSITY OF		20 *
MAYAGUEZ	PUERTO RCO	20
PURDUE RESEARCH FOUNDATION		1,431 *
LAFAYETTE	INDIANA	1,431
PURDUE UNIVERSITY		341 *
LAFAYETTE	INDIANA	341
QUEENS HOSPITAL MEDICAL CENTER		32 *
HONOLULU CITY	HAWAII	32
RAND CORP		19,590 *
SANTA MONICA	CALIFORNIA	19,590
REED COLLEGE		97 *
PORTLAND	OREGON	97
REGIS COLLEGE		152 *
WESTON	MASS	136
GRAND ISLAND	NEW YORK	16
RENSSELAER POLYTECHNIC INSTITUTE		905 *
TROY	NEW YORK	905
RESEARCH ANALYSIS CORP		9,106 *
	THAILAND	70-
MCLEAN	VIRGINIA	9,176
RESEARCH TRIANGLE INSTITUTE		701 *
DURHAM	NCAR	39
TRIANGLE PARK	NCAR	662

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
RETINA FOUNDATION INST BIO MED SCS		35 *
BOSTON	MASS	35
RHODE ISLAND UNIVERSITY OF		1,190 *
KINGSTON	RI	1,190
RICE UNIVERSITY		512 *
HOUSTON	TEXAS	512
RIVERSIDE RESEARCH INSTITUTE		8,677 *
WHITE SANDS MS	NEW MEXICO	3,449
NEW YORK	NEW YORK	5,228
ROCHESTER UNIVERSITY OF		9,061 *
ARLINGTON	VIRGINIA	8,204
ROCHESTER	NEW YORK	857
ROCKEFELLER UNIVERSITY		38 *
NEW YORK	NEW YORK	38
RUTGERS UNIVERSITY		125 *
NEW BRUNSWICK	NEW JERSEY	125
SAINT JOHNS HOSPITAL		16 *
OXNARD	CALIFORNIA	16
SAINT LOUIS UNIVERSITY		92 *
ST LOUIS	MISSOURI	92
SAINT LUKES HOSPITAL CENTER		99 *
CHICAGO	ILLINOIS	59
NEW YORK	NEW YORK	40
SAN DIEGO STATE COLLEGE FOUNDATION		776 *
SAN DIEGO	CALIFORNIA	776
SAN FRANCISCO UNIVERSITY OF		49 *
SAN FRANCISCO	CALIFORNIA	49
SAN JOSE STATE COLLEGE		68 *
SAN JOSE	CALIFORNIA	68
SAN JOSE STATE COLLEGE FOUNDATION		32 *
SAN JOSE	CALIFORNIA	32
SCIENCE RESOURCES FOUNDATION		55 *
SUDBURY	MASS	20
WATERTOWN	MASS	35
SCIENCE INFORMATION EXCHANGE		10 *
WASHINGTON	DC	10
SCRIPPS CLINIC RESEARCH		92 *
LA JOLLA	CALIFORNIA	92
SETON HALL COLLEGE OF		12 *
SOUTH ORANGE	NEW JERSEY	12
SHEEHAN JOHN C INSTITUTE RESEARCH		50 *
CAMBRIDGE	MASS	50
SOCIETY OF AMERICAN MILITARY ENGRS		42 *
WASHINGTON	DC	42
SOCIETY INDUSTRIAL APPLIED MATH		11 *
PHILADELPHIA	PA	11
SOUTH CAROLINA UNIVERSITY OF		92 *
COLUMBIA	SCAR	92

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
SOUTH DAKOTA STATE UNIVERSITY		46 *
BROOKINGS	SDAK	46
SOUTHERN CALIFORNIA UNIVERSITY OF		1,537 *
LOS ANGELES	CALIFORNIA	1,537
SOUTHERN METHODIST UNIVERSITY OF		96 *
DALLAS	TEXAS	96
SOUTHERN RESEARCH INSTITUTE		1,101 *
BIRMINGHAM	ALABAMA	1,101
SOUTHWEST RESEARCH INSTITUTE		5,278 *
RIVER OAKS	TEXAS	15
SAN ANTONIO	TEXAS	4,803
WRIGHT PATTERS	OHIO	460
SOUTHWESTERN LOUISIANA UNIVERSITY		15 *
LAFAYETTE	LOUISIANA	15
SPACE RESEARCH INSTITUTE INC		1,311 *
NORTH TROY	VERMONT	1,311
SPEECH COMMUNICATIONS RESEARCH LAB		113 *
SANTA BARBARA	CALIFORNIA	113
STANFORD RESEARCH INSTITUTE		25,392 *
	THAILAND	54-
ARLINGTON	VIRGINIA	48
CASCADE	MONTANA	325
CHATANIKA	ALASKA	449
RICHEY	MONTANA	441
HUNTSVILLE	ALABAMA	4,182
MENLO PARK	CALIFORNIA	19,855
STANFORD	CALIFORNIA	146
STANFORD UNIVERSITY		7,702 *
MENLO PARK	CALIFORNIA	93
STANFORD	CALIFORNIA	7,609
STANISLAUS STATE COLLEGE FOUND		19 *
TURLOCK	CALIFORNIA	19
STEVENS INSTITUTE OF TECHNOLOGY		535 *
HOBOKEN	NEW JERSEY	535
SYRACUSE UNIVERSITY		849 *
ROME	NEW YORK	42
SYRACUSE	NEW YORK	807
SYRACUSE UNIVERSITY RESEARCH CORP		3,174 *
GUILDERLAND CE	NEW YORK	199
SYRACUSE	NEW YORK	2,975
TEMPLE UNIVERSITY		35 *
PHILADELPHIA	PA	35
TENNESSEE TECHNOLOGICAL UNIVERSITY		11 *
COOKEVILLE	TENNESSEE	11
TENNESSEE UNIVERSITY OF		733 *
KNOXVILLE	TENNESSEE	557
MEMPHIS	TENNESSEE	79
TULLAHOMA	TENNESSEE	97
TEXAS A & M RESEARCH FOUNDATION		1,495 *
COLLEGE STATIO	TEXAS	1,495
TEXAS A & M UNIVERSITY		78 *
COLLEGE STATIO	TEXAS	78
TEXAS TECHNOLOGICAL COLLEGE		94 *
LUBBOCK	TEXAS	94
TEXAS UNIVERSITY OF		5,912 *
AUSTIN	TEXAS	5,616
DALLAS	TEXAS	25
EL PASO	TEXAS	150
GALVESTON	TEXAS	75
SAN ANTONIO	TEXAS	46
TRAVELERS RESEARCH CENTER		56 *
HARTFORD	CONN	56
TRUDEAU INSTITUTE INC		73 *
SARANAC LAKE	NEW YORK	73
TUFTS UNIVERSITY		247 *
BOSTON	MASS	67
MEDFORD	MASS	180
TULANE UNIVERSITY OF LOUISIANA		135 *
NEW ORLEANS	LOUISIANA	135
UNITED STATES CIVIL DEFENSE COUNCL		75 *
WASHINGTON	DC	75
UNIVERSITY HOSPITAL INC		64 *
BOSTON	MASS	64
UTAH STATE UNIV OF AGRIC & APPL SC		938 *
LOGAN	UTAH	938
UTAH UNIVERSITY OF		2,255 *
DUGWAY	UTAH	23
SALT LAKE CITY	UTAH	2,232
VANDERBILT UNIVERSITY		205 *
NASHVILLE	TENNESSEE	205
VERMONT UNIV OF & STATE AGRIC COLL		209 *
BURLINGTON	VERMONT	209
VIRGIN ISLANDS COLLEGE OF		35 *
	VIRGIN IS	35
VIRGINIA INST OF MARINE SCIENCES		80 *
GLOUCESTER POI	VIRGINIA	80
VIRGINIA MASON RESEARCH CENTER		35 *
SEATTLE	WASHINGTON	35
VIRGINIA MILITARY INSTITUTE		16 *
LEXINGTON	VIRGINIA	16
VIRGINIA POLYTECHNIC INSTITUTE		245 *
BLACKSBURG	VIRGINIA	245
VIRGINIA UNIVERSITY OF		602 *
CHARLOTTESVILL	VIRGINIA	602
WASHINGTON STATE UNIVERSITY		127 *
PULLMAN	WASHINGTON	127
WASHINGTON UNIVERSITY		1,345 *
ST LOUIS	MISSOURI	1,345
WASHINGTON UNIVERSITY OF		4,463 *
SEATTLE	WASHINGTON	4,463
WAYNE STATE UNIVERSITY		251 *
DETROIT	MICHIGAN	251

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS	NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
WENTWORTH INSTITUTE		974 *		
BOSTON	MASS	974		
WESLEYAN UNIVERSITY		20 *		
MIDDLETOWN	CONN	20		
WESTERN MICHIGAN UNIVERSITY		90 *		
KALAMAZOO	MICHIGAN	90		
WILLIAMS COLLEGE		16 *		
WILLIAMSTOWN	MASS	16		
WISCONSIN UNIVERSITY OF		801 *		
MADISON	WISCONSIN	780		
LOS ANGELES	CALIFORNIA	21		
WITTENBERG UNIVERSITY		15 *		
SPRINGFIELD	OHIO	15		
WOODS HOLE OCEANOGRAPHIC INST		6,862 *		
WOODS HOLE	MASS	6,862		
WORCESTER POLYTECHNIC INSTITUTE		70 *		
WORCESTER	MASS	70		
WORLD LIFE RESEARCH INSTITUTE		34 *		
COLTON	CALIFORNIA	34		
WRIGHT STATE UNIVERSITY		221 *		
DAYTON	OHIO	29		
WRIGHT PATTERS	OHIO	192		
WYOMING UNIVERSITY OF		77 *		
LARAMIE	WYOMING	77		
YALE UNIVERSITY		1,197 *		
NEW HAVEN	CONN	1,197		
YESHIVA UNIVERSITY		273 *		
BRONX	NEW YORK	80		
NEW YORK	NEW YORK	193		
ZARET FOUNDATION INC		15 *		
SCARSDALE	NEW YORK	15		
		603,124		

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION		THOUSANDS OF DOLLARS
GORGAS MEMORIAL INSTITUTE OF TROPI		121 *
WASHINGTON	DC	121
NATIONAL ACADEMY OF SCIENCES		2,636 *
WASHINGTON	DC	2,525
EDGEWOOD	MARYLAND	53
DOVER	NEW JERSEY	58
NATIONAL SCIENCE FOUNDATION		89 *
WATERTOWN	MASS	89
SMITHSONIAN INSTITUTION		852 *
	GREECE	14
WASHINGTON	DC	733
CAMBRIDGE	MASS	105
UNITED STATES AGRICULTURE DEPT		415 *
WASHINGTON	DC	300
MADISON	WISCONSIN	115
UNITED STATES ATOMIC ENERGY COMM		1,693 *
WASHINGTON	DC	108
ALBUQUERQUE	NEW MEXICO	617
LAS VEGAS	NEVADA	262
ARGONNE	ILLINOIS	196
LOS ALAMOS	NEW MEXICO	300
OAK RIDGE	TENNESSEE	170
UPTON	NEW YORK	40
UNITED STATES COMMERCE DEPT		1,917 *
WASHINGTON	DC	929
ASHEVILLE	NCAR	20
BOULDER	COLORADO	659
GAITHERSBURG	MARYLAND	20
ROCKVILLE	MARYLAND	289
UNITED STATES H E W DEPT		75 *
BETHESDA	MARYLAND	30
BERKELEY	CALIFORNIA	35
SAVANNAH	GEORGIA	10
UNITED STATES INTERIOR DEPT		337 *
WASHINGTON	DC	82
ALBANY	OREGON	110
DENVER	COLORADO	20
PITTSBURGH	PA	125
UNITED STATES JUSTICE DEPT		20 *
ALDERSON	WVA	20
UNITED STATES NATL AERO SPACE AGY		6,260 *
BAY ST LOUIS	MISS	99
RIDGELEY	WVA	5,966
HOUSTON	TEXAS	55
MOFFETT FIELD	CALIFORNIA	140
UNITED STATES TRANSPORTATION DEPT		76 *
WASHINGTON	DC	14-
ATLANTIC CITY	NEW JERSEY	90
UNITED STATES VETERANS ADMIN		4 *
ANN ARBOR	MICHIGAN	27
CHICAGO	ILLINOIS	23-
		14,495

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

NAME OF CONTRACTOR AND LOCATION	THOUSANDS OF DOLLARS
ABASSIA FEVER HOSPITAL	50 *
UAR	50
AIN SHAMS UNIVERSITY MED SCHOOL	30 *
UAR	30
ALL INDIA INSTITUTE OF MED SCIENCE	104 *
INDIA	104
A L P E N S	30 *
FRANCE	30
APPLICAZIONI RICERCHE SCIENTIFICHE	12 *
ITALY	12
BEILINSON HOSPITAL	20 *
ISRAEL	20
BRITISH COLUMBIA UNIVERSITY OF	83 *
CANADA	83
CAMBRIDGE UNIVERSITY OF	24 *
UN KINGDOM	24
CANADIAN COMMERCIAL CORP	6,215 *
BERMUDA	1,095
CANADA	5,081
WARMINSTER PA	39
CATTEDRA DI EMATOLOGIA	35 *
ITALY	35
CENTRAAL LABORATORIUM T N O	20 *
NETHERLNDS	20
CENTRAL INST FOR INDUSTRIAL RESRCH	10 *
NORWAY	10
CENTRO STUDI TRASPORTI MISSILISTIC	10 *
ITALY	10
DANISH METEOROLOGICAL INSTITUTE	10 *
DENMARK	10
DEFENSE RESEARCH BD CANADIAN J S	21 *
CANADA	21
FULMER RESEARCH INSTITUTE	20 *
UN KINGDOM	20
HEBREW UNIVERSITY	43 *
ISRAEL	43
INDIAN INSTITUTE OF SCIENCE	75 *
INDIA	75
INSTITUT FUER METOROLOGIE & GEOPHY	15 *
GERMANY	15
INSTITUTE OF THEORETICAL ASTROPHYS	25 *
AUSTRIA	12
NORWAY	13
INSTITUTO DE QUIMCA ORGANICA	30 *
SPAIN	30
ISRAEL INSTITUTE OF APPLD SOC RSCH	20 *
ISRAEL	20
LABORATOIRE D OPTIQUE	13 *
FRANCE	13
MANCHESTER UNIVERSITY	29 *
UN KINGDOM	29
MANILA OBSERVATORY	27 *
PHILPPINES	27
MCGILL UNIVERSITY	22 *
CANADA	22
NAPOLI UNIVERSITA DI	25 *
ITALY	25
NATIONAL COMMITTEE OF NUCLR ENGRY	25-*
ITALY	25-
NORWEGIAN DEFENSE RESEARCH ESTABMT	300-*
NORWAY	300-
NOTTINGHAM UNIVERSITY OF	11 *
UN KINGDOM	11
OXFORD UNIVERSITY	12 *
UN KINGDOM	12
ROME UNIVERSITY OF	12 *
ITALY	12
ROYAL GREENWICH OBSERVATORY	15 *
UN KINGDOM	15
ROYAL INSTITUTE OF TECHNOLOGY	12 *
SWEDEN	12
ROYAL NORWEGIAN CNCL SCNTFC IND RS	611 *
NORWAY	611
SOUTHAMPTON UNIVERSITY OF	10 *
UN KINGDOM	10
STANDARDS INSTITUTION OF ISRAEL	52 *
ISRAEL	52
TECHNION RESEARCH FOUNDATION	73 *
ISRAEL	73
TECHNISCHE HOCHSCHULE	10 *
GERMANY	10
TEL AVIV UNIVERSITY	27 *
ISRAEL	27
UNIVERSITY OF TECHNOLOGY	49 *
UN KINGDOM	49
UPPSALA UNIVERSITY OF	12 *
SWEDEN	12
VON KARMAN INSTITUTE FOR FLUID DYN	10 *
BELGIUM	10
WEIZMANN INSTITUTE OF SCIENCE	82 *
ISRAEL	82
WINDSOR UNIVERSITY OF	25 *
CANADA	25
	7,716

- * MINUS AMOUNT (CANCELLATIONS EXCEED NEW AWARDS)

A–X AND CHEYENNE

Chairman ELLENDER. Senator Allott.

Senator ALLOTT. Thank you, Mr. Chairman.

I would like to go back to the discussion of the A–X and Cheyenne. In previous hearings held by this committee, I received the impression that by October 1 the Department of Defense would make a selection between these two aircraft.

From your testimony yesterday I gathered the impression that it was not a question of either/or but a question of whether both might be needed, and that both might be requested.

Will you explain this apparent discrepancy? I say apparent, because I might have misunderstood it.

Dr. FOSTER. Senator Allott, there is confusion on this point. Perhaps I can clarify the matter.

First, we are asking for research and development money to pursue the A–X program in fiscal year 1973. We are not asking for any production funds. In the advanced attack gunship effort we are asking for money to develop the Cheyenne and to put together three test vehicles—or, if we decide in the latter part of the summer to take another course, to use the money to develop another vehicle. We are not asking for any production funds for the Cheyenne or other advanced attack helicopters.

I see fiscal year 1973 as a year in which we will pursue the development of A–X and select a contractor, in which will decide to go ahead with the Cheyenne program or to abandon it and follow another course, and in which we will bring along those two approaches to the point of a decision. That decision could go against either one on its own merits. It could go in favor of both on their merits, or one or the other.

Senator ALLOTT. Thank you.

BUDGET REQUEST

Chairman ELLENDER. Dr. Foster, earlier I asked you about management and the part you play in supervising the work of the three Defense services. You gave an answer. Now, the total amount requested by the three services and your own work in the Office of the Secretary of Defense is $8,551,767,000.

Dr. FOSTER. That is correct.

Chairman ELLENDER. Do you know of any other expenses attached to that program?

Dr. FOSTER. No; I don't, other than those that would be incurred as a result of pay increases guaranteed by the Congress subsequently.

PERSONNEL

Chairman ELLENDER. You are familiar with the fact that there are 34,300 military personnel assigned to that program?

Dr. FOSTER. Yes, sir.

Chairman ELLENDER. And that their pay is not included in this $8,551 million?

Dr. FOSTER. That is correct. That is why we call it R.D.T. & E. When the military personnel costs are included, we use the term R. & D.

Chairman ELLENDER. Some of us have been trying to reduce personnel.

Dr. FOSTER. Yes, I understand.

Chairman ELLENDER. Today 56 percent of our Defense outlays is required for manpower.

In reviewing the requests for the military personnel appropriations, it was developed that we have about 35,000 military personnel assigned to R. & D. activities, of which over 10,000 are officers. You are familiar with that?

Dr. FOSTER. Yes, sir.

Chairman ELLENDER. And for extra costs there is a sum in the budget of $364 million. You are familiar with that?

Dr. FOSTER. Yes, sir. There will be about 10,600 officers and 23,400 enlisted men in support of research and development for fiscal year 1973 at a cost of $364 million. Approximately 70 percent of the military personnel is assigned to support testing and evaluation work such as the missile ranges and other mission-related technical facilities. The preponderance of the 70 percent are enlisted personnel who man these military installations and who serve in military units which test developmental equipment under typical field operating conditions. In addition to the actual testing, military professionals, because of their operational experience, are important in evaluating the effectiveness and reliability of newly developed weapons systems.

The other 30 percent of the military personnel is assigned to the in-house laboratories, development requirements organizations, and other systems acquisition activities. Assignments are made to gain maximum utilization of individual scientific and management skills and to apply these skills in combination with military experience. Here the unique combination of a military man with his field operational experience and his scientific training, coupled with civilian professionals, provides a balanced and effective team to accomplish the DOD goals.

Chairman ELLENDER. I thought I would bring it to the attention of the Senate.

TERMINATION OF R. & D. PROGRAMS

Earlier I referred to the terminated B–70 bomber program on which we spent about $1.5 billion. There have been other projects on which we have spent substantial sums that were terminated; for example, the Navy's F–111B aircraft, the Air Force's mobile medium range ballistic missile, and the Army's recently terminated XM–803 main battle tank. I will include in the record at this point a listing of the major projects terminated during the past 10 years and the amount spent on each.

(The information follows:)

MAJOR PROJECTS TERMINATED DURING THE PAST 10 YEARS

[Dollars in millions]

Project	Year started	Year cancelled	Funds invested
Aircraft:			
Navy:			
A-2J-1	1948	1963	$20.0
F-111B	1961	1968	384.1
Air Force			
X-21	1960	1966	36.0
X-19	1962	1966	16.0
XB-70	1958	1957	1,468.1
X-15	1950	1968	210.5
RF-111	1966	1907	26.9
Rard Rock Silo	1968	1970	49.2
Missiles:			
Army: Mauler	1960	1965	200.0
Navy: Typhon	1958	1964	225.0
Air Force:			
Snark	1947	1962	677.4
GAM-87 Skybolt	1960	1963	440.0
Mobile Minuteman	1959	1962	108.4
MMRBM	1962	1964	65.4
Astronautics: Air Force: MOL	1964	1970	1,491.9
Ordnance, combat vehicles and related equipment: Army:			
Truck, cargo 2½-ton	1946	1965	5.9
Truck, cargo 16-ton	1959	1965	[1] 4.8
Truck, tank, 5,000-gallon	1959	1966	(1)
Truck, wrecker, 20-ton	1959	1966	(1)
Area scanning alarm (E-49)	1957	1966	3.9
Infantry mortar, 107mm., XM-95	1960	1967	10.7
Howitzer, 155mm. self-propelled XM-138	1964	1968	5.3
M-179 155mm. self-propelled howitzer	1963	1969	4.9
E 27 chemical warhead for Lance missile	1962	1970	7.2
Main battle tank, XM-803	1964	1972	234.8
Truck, utility, 1¼-ton XM-705/XM-737	1965	1972	12.8
Other equipment:			
Army:			
AN/USD-5 drone	1957	1962	103.3
Auto integrated switch	1958	1965	39.9
Radio frequency amplifier for AN/PRC-25	1963	1969	.6
Signal generator set AN/URN-123	1963	1970	.4
Tactical extended range antenna system	1965	1969	1.0
RADA	1963	1970	27.0
Mallard	1966	1970	27.0
Navy:			
NRRS, Sugar Grove	1957	1962	70.0
DSSV	1969	1970	12.1
BW/CW weapons	1965	1969	11.7
Air Force: Dyna-Soar	1960	1963	405.0

[1] The 3 trucks listed comprise the 16-ton series of the GOER program which was terminated in June 1965. Work was officially terminated on the tanker and wrecker in February 1966. The cost of the program was $4,800,000.

FEDERAL CONTRACT RESEARCH CENTERS

Chairman ELLENDER. In the tabulation on page 6–2 of your statement it is indicated that the R.D.T. & E. requests for fiscal year 1973 include $214.7 million for work to be performed by the various Federal contract research centers, such as Rand Corp., Aerospace Corp., Center for Naval Analysis, and Institute for Defense Analyses. The total fiscal year 1972 budget for the Department of Defense includes $254.9 million for work to be performed by these organizations.

I will include in the record at this point a tabulation setting out the funding for each of these organizations and the sources of that funding.

(The information follows:)

FEDERAL CONTRACT RESEARCH CENTERS, ALL APPROPRIATIONS, FISCAL YEAR 1973 PRESIDENT'S BUDGET

[In thousands of dollars]

	Army	Navy	Air Force	Defense agencies	Totals
Aerospace Corp.:					
R.D.T. & E	3,280	860	46,598	1,300	52,038
Aircraft/missile procurement			3,678		3,678
Other procurement			14,219		14,219
O. & M			530		530
Total	3,280	860	65,025	1,300	70,465
Analytical Services, Inc.: R.D.T. & E			1,859	100	1,959
Applied Physics Lab, Johns Hopkins:					
R.D.T. & E	100	31,485	1,225	1,000	33,810
O. & M	1,020	9,700			10,720
Aircraft/missile procurement		1,050			1,050
Shipbuilding		50			50
Other procurement		325			325
Total	1,120	42,610	1,225	1,000	45,955
Applied Physics Lab, University of Washington:					
R.D.T. & E		1,128			1,128
O. & M		552			552
Total		1,680			1,680
Center for Naval Analysis:					
R.D.T. & E		9,150		90	9,240
O. & M		626			626
Total		9,776		90	9,866
Human Resources Research Organization: R.D.T. & E	3,700		150	335	4,185
Institute for Defense Analysis:					
R.D.T. & E				9,672	9,672
Res/shelter survey				260	260
Total				9,932	9,932
Lincoln Laboratory: R.D.T. & E	9,108	1,072	26,828	7,750	44,758
Mitre Corp.:					
R.D.T. & E	1,450		26,091	3,634	31,175
O. & M	250		2,595	1,300	4,145
Other procurement			2,470		2,470
Total	1,700		31,156	4,934	37,790
Ordnance Research Lab, Penn State:					
R.D.T. & E		6,300			6,300
Rand Corp.:					
R.D.T. & E			8,000	5,750	13,750
Res/shelter survey					
O. & M				150	150
Total			8,000	5,900	13,900
Research Analysis Corp.:					
R.D.T. & E	6,160			485	6,645
O. & M	1,400				1,400
Res/shelter survey				30	30
Total	7,560			515	8,075
Totals:					
R.D.T. & E	23,798	49,995	110,751	30,116	214,660
Aircraft/missile procurement		1,050	3,678		4,728
Other procurement		325	16,689		17,014
Shipbuilding		50			50
O. & M	2,670	10,878	3,125	1,450	18,123
Res/shelter survey				290	290
Grand total	26,468	62,298	134,243	31,856	254,865

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that questions submitted by him be answered for the record. The questions and the responses will appear at this point.

(The questions and answers follow:)

SAFEGUARD COST GROWTH

Senator Thurmond, Dr. Foster, what has been the cost in the Safeguard ABM System for the past three years?

Dr. Foster. Our DoD acquisition cost estimates for the Safeguard 4- and 12-site deployments given for the last 3 years, along with the increases between

(The questions and answers follow:)

Deployment	Fiscal year 1970 budget hearings (spring 1969)	Fiscal year 1971 budget hearings (spring 1970)	Fiscal year 1972 budget hearings (spring 1971)	Fiscal year 1973 budget hearings (spring 1972)	Cumulative change since 1st estimate
4 sites:					
Acquisition cost	(1)	6.4	7.1	8.0	
Change			+.7	+.9	+1.6
Stretchout			(+.2)	(+.2)	(+.4)
Inflation			(+.7)	(+.2)	(+.9)
Program change and revised estimate			(−.2)	(+.5)	(+.3)
12 sites:					
Acquisition cost	9.1	10.7	13.7	16.3	
Change		+1.6	+3.0	+2.6	+7.2
Stretchout		(+.6)	(+.7)	(+.6)	(+1.9)
Inflation		(+.4)	(+1.9)	(+.9)	(+3.2)
Program change and revised estimate		(+.6)	(+.4)	(+1.1)	(+2.1)

[1] No estimate.

Senator Thurmond. What is the reason for this cost growth by year?

Dr. Foster. From the tabulation provided in answer to your first question, it can be seen that the cost growth for the 4-site deployment over the past 2 years has been $1.6 billion, or 25 percent of the original $6.4-billion estimate. The cost growth for the 12-site deployment over the past 3 years has been $7.2 billion, or 79.1 percent of the original $9.1-billion estimate.

This cost growth can be better understood through a discussion of the increases shown by category in the tabulation. There have been three causes of growth in the Safeguard cost estimates: (1) inflation (both that already experienced and that included in the estimates for the anticipated future), (2) stretchout (the additional cost resulting from the extension of deployment schedules), and (3) program changes and revised estimates.

The first two of these categories are largely beyond the control of those charged with managing the Safeguard program. The cost growth experienced for the third category (program changes and revised estimates) have been: (1) for the 4-site deployment, $0.3 billion since the fiscal year 1971 hearings, or 4.7 percent of the original $6.4-billion estimate, and (2) for the 12-site deployment $2.1 billion since the fiscal year 1970 hearings, or 23.1 percent of the original $9.1-billion estimate. The much greater increases caused by inflation plus stretchout—$1.3 billion, or $20.3 percent of the original estimate for the 4-site deployment, and $5.1 billion, or 56 percent of the original estimate for the 12-site deployment—have resulted largely from: (1) inflation experienced since the time of the original estimate, plus the OSD decision a year ago to increase the realism of cost esimates by including allowances for anticipated future inflation, and (2) decisions by both the Administration and the Congress to proceed with Safeguard deployment, especially that calling for 12 sites, at less than the greatest possible speed in view of diplomatic and other considerations.

Safeguard Developmental Problems

Senator Thurmond. Dr. Foster, what are the chief technical problems which remain in development of the Safeguard ABM system?

Dr. Foster. The principal technical problems remaining in development of the Safeguard system are related to software for the tactical computers, test and evaluation of the integrated Safeguard components at Kwajalein, and installation and test (I&T) of tactically deployed equipment. Solution of these problems does not require technical breakthroughs, but rather a sizable amount of precise planning, reduction of test data, analysis of results, and time-consuming computer coding.

Development of tactical software for the Grand Forks site began in June 1969, and the first issue of the process design specifications for the PAR and the MSR was completed in October 1970. (A process is an integrated group of computer programs that controls the tactical operations of the system.) These processes are coded, tested, and integrated at the Tactical Software Control Site, and finally shipped to the Safeguard site. Parts of these programs have been completed and checked out, several milestones being met along the way. The complete PAR and MSR processes are scheduled for delivery to the Grand Forks site in late 1973. The software design is on schedule; it is receiving high-level supervision to prevent scheduling problems.

The system-test program at the Kwajalein Missile Range has been highly successful. We have completed the initial phase of the program, which included 16 tests, of which 12 were successful, 2 were partially successful, and 2 were unsuccessful. We are now in the phase of the program that provides the most comprehensive, quantitative in-depth evaluation of our tactical operating modes and system performance. So far in this phase, we have had 10 tests, all successful. About 35 tests remain to be conducted in this phase, which is scheduled for completion in 1974.

During I&T, various equipments are installed, certain preliminary tests made, other components installed, checks and cross checks made, and final tests completed. Installation of the data processor and command and control equipment at the Ballistic Missile Defense Center will start in fiscal year 1973. At Grand Forks, I&T of the MSR and PAR (with their associated data processors and command and control equipment), the missile-launch equipment for both Spartan and Sprint, and the remote launch equipment for Sprint will also start during fiscal year 1973.

No prototype PAR was developed for the Safeguard system, as a similar radar, the Air Force AN/FPS–85, had been constructed and was operational and a limited engineering development model was produced and used to check out the basic design. Initially the Grand Forks PAR will be used as an R&D radar; as such, some minor design problems can be expected during I&T. Time to solve them is included in the I&T schedule.

Cost of Four-Site Program

Senator Thurmond. Under present projections what would be the total cost of a 4-site program?

Dr. Foster. As indicated in my answer to your first question, our current estimate for the DoD acquisition cost (RD&E, Procurement and MCA costs to the last site's availability) is approximately $8 billion. Over the same period, we estimate a requirement for about $0.9 billion in the operating appropriations (OMA and MPA), bringing the total DoD direct cost to approximately $8.9 billion. This total does not include AEC costs of about $1 billion and certain DoD indirect costs budgeted elsewhere (e.g., national range support and family housing), which total about $0.5 billion.

Hardsite Availability to Counter Threat

Senator Thurmond. Dr. Foster, if the Soviets continue their ICBM buildup would Hardsite be available to the U.S. early enough to counter this new threat?

Dr. Foster. Yes. Assuming appropriate approvals and funding, the Site Defense of Minuteman (formerly called Hardsite) could be available for deployment in [deleted].

Radars No Major Problems

Senator Thurmond. Are the radars the chief technical problem in connection with Hardsite?

Dr. Foster. No, the design of the radar envisioned for the Site Defense program is not a major technical problem. State-of-the-art components and design techniques for design and fabrication of the radar subsystem are specified. Phased-array radar technology has evolved to the point at which no major developmental or high-risk technical programs are required to develop the Site Defense prototype radar. Along with the other subsystem components, that radar is being prototyped to ensure adequate system integration.

Hardsite Integration With Safeguard

Senator Thurmond. Would Hardsite be independent of Safeguard, or would there be an overlapping in the radar systems of the two programs?

Dr. Foster. Site Defense will be capable of autonomous operation or integration with Safeguard. It is not planned that the radars of the two systems will have overlapping functions. The radars for the multiple Safeguard missions and control of the Spartan interceptors have a longer range than the Site Defense radars and, thus, have different operating modes. The long-range detection information available from the Safeguard radars would be used by the Site Defense system.

Use of Current Funding Request for New Tank

Senator Thurmond. Dr. Foster, the Army is asking $26 million this year for development of a new tank. Specify the use planned for these funds.

Dr. Foster. The total of $26 million includes $19.7 million for the new main battle tank development program and $6.4 million for continuation of the M60A1 tank product-improvement program. The planned use of these funds is as follows:

(1) Development of new main battle tank (MBT):
   (*a*) continuation of expanded effort on those components that are likely candidates for use in the new MBT; and
   (*b*) initiation of tank-prototype development contracts.
(2) Product improvement of the M60A1:
   (*a*) continued development and test of laser rangefinder, solid-state computer, and tube-over-bar suspension; and
   (*b*) continued fabrication and feasibility testing of thermal sight.

Tank Program Funding

Senator Thurmond. What additional funds will be required in the next few years to complete a tank development program?

Dr. Foster. Additional funds will obviously be required, although the specific amount has not yet been determined. It will probably be August or September 1972 before we have a good "handle" on the funding requirements for the new tank.

Characteristics of Main Battle Tank

Senator Thurmond. When will the tank study group propose the characteristics for the proposed new vehicle?

Dr. Foster. The Main Battle Task Force is scheduled to submit its recommended material-need document describing these characteristics by August 1972.

Use of Vehicles From Other Programs

Senator Thurmond. What is being done with the R&D vehicles left over from the MBT–70 and XM803 programs?

Dr. Foster. Those that are still operational are being used as test beds for tank components and subsystems. For example, the XM803 pilot No. 8 (number 2 of the two second-generation pilots, with turret incomplete) will be used as a test bed for the 1500-horsepower turbine that is a candidate for the new tank's engine.

Acceleration of Tank Schedule

Senator Thurmond. Dr. Foster, other witnesses state it may take 8 years to develop a new tank before production can begin. How could this schedule be accelerated?

Dr. FOSTER. The Army intends to implement a program that will provide a new tank in the shortest possible time. Currently the Army is reviewing its entire weapon-system-acquisition process with respect to the new tank as well as other systems. The objective of this review is to shorten the weapon-system-acquisition cycle substantially, at the same time maintaining a high assurance that the resulting system will be effective, reliable, and maintainable and can be procured at a reasonable cost. In the case of the new tank, the attainment of this objective will be facilitated by making maximum use of the lessons learned in the MBT–70 and XM803 programs and advances in component and system technology relating to armor protection, mobility, firepower, and fire control.

Chairman ELLENDER. If there are no further questions, Doctor, we thank you very much.

Dr. FOSTER. Thank you, Mr. Chairman.

(Whereupon, at 11 a.m., the subcommittee continued with other business.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

TUESDAY, MARCH 14, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10:10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Allott, Case, and Symington.

DEPARTMENT OF DEFENSE

ADVANCED RESEARCH PROJECTS AGENCY

STATEMENT OF DR. STEPHEN J. LUKASIK, DIRECTOR

ACCOMPANIED BY RUSSELL W. BEARD, DIRECTOR, PROGRAM MANAGEMENT

1972 APPROPRIATION AND 1973 BUDGET REQUEST

Chairman ELLENDER. The subcommittee will come to order.

We shall next consider the request for the Advanced Research Projects Agency for fiscal year 1973 which is $226,727,000, as compared with the fiscal year 1972 appropriation of $209,890,000. These funds are contained in the Research, Development, Test and Evaluation, Defense Agencies appropriation.

PROGRAM AND FINANCING

Chairman ELLENDER. At this point in the record there will appear certain program and financing information from the justifications dealing with the appropriation for Research, Development, Test and Evaluation Defense Agencies.

(The information follows:)

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE AGENCIES PROGRAM AND FINANCING

[In thousands of dollars]

	Budget plan (amounts for R.D.T. & E. actions programed)			Obligations		
	1971 actual	1972 estimate	1973 estimate	1971 actual	1972 estimate	1973 estimate
Program by activities:						
Direct:						
1. Military sciences	70,414	69,508	76,965	73,344	75,935	77,165
3. Missiles and related equipment	64,999	71,724	78,100	66,699	84,017	78,100
7. Other equipment	307,131	286,407	305,552	303,698	309,164	305,352
8. Programwide management and support	10,570	19,962	49,270	10,501	20,040	49,270
Total direct	453,114	447,601	509,887	454,242	489,156	509,887
Reimbursable (total)	3,875	5,675	6,724	3,628	5,675	6,724
Total	456,989	453,276	516,611	457,870	494,831	516,611
Financing:						
Receipts and reimbursements from—						
Federal funds	−1,601	−3,280	−3,724	−1,617	−3,280	−3,724
Trust funds	−2,274	−2,395	−3,000	−2,011	−2,395	−3,000
Unobligated balance available, start of year for completion of prior year budget plans				−64,867	−58,389	−11,834
Reprograming from (−) or to prior year budget plans	−5,350	−5,000				
Unobligated balance transferred from other accounts		−5,000			−5,000	
Unobligated balance transferred to other accounts		5,000			5,000	
Unobligated balance available, end of year for completion of prior year budget plans				58,389	11,834	11,834
Budget authority	447,764	442,601	509,887	447,764	442,601	509,887
Budget authority:						
Appropriation	444,564	441,143	507,200	444,564	441,143	507,200
Transferred to other accounts	−3,000			−3,000		
Transferred from other accounts	6,200			6,200		
Appropriation (adjusted)	447,764	441,143	507,200	447,764	441,143	507,200
January 1972 pay increase supplemental/amendment		1,458	2,687		1,458	2,687

Note: The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defensewide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

SUMMARY OF TOTAL OBLIGATIONAL AUTHORITY BY AGENCY

Chairman ELLENDER. There will also be included at this point a summary of total obligational authority by the agencies represented in the appropriation "Research, Development, Test and Evaluation, Defense Agencies."

(The information follows:)

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE AGENCIES SUMMARY OF TOTAL OBLIGATIONAL AUTHORITY (TOA) BY AGENCY

[In thousands of dollars]

Defense agency	Program		
	1971 actual	1972 estimate	1973 estimate
Advanced Research Projects Agency	208,960	209,824	226,600
January 1972 pay increase supplemental/amendment		66	147
Defense Communications Agency	14,300	16,572	13,800
January 1972 pay increase supplemental/amendment		49	112
Defense Special Projects Group	14,000	9,300	
Defense Nuclear Agency	108,700	113,951	127,700
January 1972 pay increase supplemental/amendment		633	1,041
Fiscal year 1972 program supplemental		5,000	
Defense Intelligence Agency	2,150	900	4,300
January 1972 pay increase supplemental/amendment			10
National Security Agency	82,794	65,207	72,200
January 1972 pay increase supplemental/amendment		495	989
Fiscal year 1972 program supplemental		5,200	
Defense Supply Agency	10,570	13,156	12,500
January 1972 pay increase supplemental/amendment		206	370
OSD/JCS, technical support to	11,640	17,233	50,100
January 1972 pay increase supplemental/amendment		9	18
Total program	453,114	446,143	507,200
January 1972 pay increase supplemental/amendment		1,458	2,687
Fiscal year 1972 program supplemental		10,200	
Grand total	453,114	457,801	509,887

AGENCY ORGANIZATION AND ROLE

Chairman ELLENDER. The principal witness will be Dr. Stephen J. Lukasik, Director of the Agency.

Before we start, Doctor, will you tell us what ARPA is and why it was organized? I would like to hear that for the record.

Dr. LUKASIK. ARPA was organized in 1958 after the launching of the Soviet satellite. We found that we were behind in our capability to launch and use satellites in space; the Soviets had done something that had scored a technological surprise on us. The reason for the surprise was that no one in this country had been given the job of doing that kind of thing.

It was felt the best way to get the U.S. space effort moving quickly was to establish an agency to do it. ARPA was that agency. We started the present space program and after about 2 years transferred it to the military services and, at the same time, to the National Aeronautics and Space Administration which was newly organized to handle the job on a full-time basis.

Since that time, ARPA has played the same kind of role with respect to many other forefront areas of science and technology; we try to determine where there are opportunities that the Defense Establishment is missing.

We try to find out the possibilities and explore them to the point where they can be transferred over to the services. We maintain essentially a program of constant size although it is continually changing in the sense of exploring new problems and approaches; we drop those approaches that are not any good, and, for those that appear promising, transfer them to the services for further development.

SOURCES OF INFORMATION

Chairman ELLENDER. What is the source of your information to make that decision?

Dr. LUKASIK. We receive a number of inputs. Probably the most important information, from the standpoint of science and technology comes from the outside world; the people from industry, people from universities, people from nonprofit organizations, who are working in these areas of science and technology, particularly Defense-relevant areas, who generally alert us to what the possibilities are. ARPA consists of a small number of technical people and, of course, we have our own technical capability to understand what is going on.

A different kind of input comes from the military services and the intelligence community where we tend to learn either what other countries are doing or what seem to be major deficiencies in our present posture that would require some sort of improvement; there is a good deal of input from the military services.

We also maintain extensive contacts with other Government agencies; for example, we also have the benefit of the expertise and experience in the in-house Government laboratories.

COOPERATION WITH OTHER GOVERNMENTAL AGENCIES

Chairman ELLENDER. What authority have you to direct the other Government agencies to assist?

Dr. LUKASIK. Everything we do is in the form of a directive from my supervisor who is Dr. Foster, the Director of Defense Research and Engineering. Our directive instructs us to recommend to the Director of Defense Research and Engineering and the Secretary of Defense those problems that we think require attention. Thus, our authority comes from being told to do these jobs by either D.D.R. & E. or the Secretary of Defense.

PERSONNEL

Chairman ELLENDER. How many employees have you under your control?

Dr. LUKASIK. We have about 125 employees in Washington. We have about 50 employees in the field.

Chairman ELLENDER. How many are military?

Dr. LUKASIK. Twenty-five of the Washington people are military. I would estimate that about 30 of the people in the field are military. Thirty plus 25 gives a total of 55.

Chairman ELLENDER. How are they paid?

Dr. LUKASIK. Those salaries are paid by the military services.

Chairman ELLENDER. So that you have a little over 100 employees paid out of these R. & D. funds?

Dr. LUKASIK. That is correct.

RESEARCH MANAGEMENT

Chairman ELLENDER. To what extent do you do in-house work?

Dr. LUKASIK. Aside from the in-house work that I have described, namely, determining what should be done in planning the programs and monitoring the programs, we do not do in-house research ourselves. We serve as a management agency to determine what should be done and see that the money goes to the most capable performing organizations. Those performing organizations can be Government in-house laboratories, either defense or nondefense, or they can be industrial organizations, or universities or other not-for-profit organizations. We see that contracts are written for such organizations to carry out the research.

Chairman ELLENDER. You have a budget for fiscal year 1973 of $227 million. How will that money be spent aside from the personnel costs of civilian employees?

Dr. LUKASIK. In figure 4 of my——

Chairman ELLENDER. Do you cover that in your statement?

Dr. LUKASIK. I will go into that in my prepared statement.

Chairman ELLENDER. All right.

You may proceed.

ROLE OF ARPA IN THE DEFENSE R.D. & E. PROGRAM

Dr. LUKASIK. Mr. Chariman and members of the committee, I welcome the opportunity to appear before this distinguished committee as as Director of the Defense Department's Advanced Research Projects Agency to present our proposed research and development program for fiscal year 1973.

The Advanced Research Projects Agency, which consists of a small number of civilian and military scientists and engineers, is part of the Office of the Director of Defense Research and Engineering. We aid the Director of Defense Research and Engineering (D.D.R. & E.) in securing for the Department of Defense the most effective R.D.T. & E. program possible by applying both our in-house technical expertise and our capability to manage outside research programs in certain areas of particular importance designated by D.D.R. & E. While the bulk of the Defense research program is channeled directly through the military services, especially the funding of the new weapons systems that represent the largest part of the program, ARPA provides D.D.R. & E. with a key technical management tool.

You have heard many times ARPA research characterized as being high-risk/high-payoff, multiservice in nature, consisting of feasibility demonstrations, undertaken prior to the assignment of a mission to a specific military service, for an unusually rapid response, revolutionary, or requiring direct central management within the Office of the Secretary of Defense. These are all valid ways of describing the

ARPA program and they help to explain what we as an advanced research agency do. And while they are not all unique to ARPA, what is unique is that a single agency exists within the Defense Department with these characteristics. This description is incomplete, however, in that it omits other essential aspects of the Agency.

It is characteristic of very large organizations, and organizations which provide a vital service such as national security, for which the penalty for failure is very great, that they must limit innovation and are thus obliged to pursue evolutionary developments along established lines. To compensate for this tendency, it is the assigned role of ARPA to act within the Defense Department as an independent source for the introduction of new technological concepts into the Defense Establishment.

SOURCES OF INFORMATION

Chairman ELLENDER. You refer to the in-house production of new technological concepts. Where do you get your information for these new concepts?

Dr. LUKASIK. The information that we get, as I said earlier, largely comes from people outside of the Defense Department.

Chairman ELLENDER. Isn't that the function of Dr. Foster's office?

Dr. LUKASIK. That is correct. We help him to do his job. We are one of the sources of information to him. We have our in-house capability and people come to us. Since we are a line organization and we support research, then as a result we are working with people doing research, we are actively involved in these things. So it is quite likely that the actual channeling of information to Dr. Foster is through us, or one such channel is.

Chairman ELLENDER. To what extent does your authority relate to that of Dr. Foster?

Dr. LUKASIK. I work for him. I do what he tells me to do. He is the final arbiter on the R.D.T. & E. budget within the Defense Department. I present my proposed program to him and he approves it.

PROPOSED PROGRAMS

Chairman ELLENDER. Can you be specific and state what programs you have submitted to him during the current or the last fiscal year?

Dr. LUKASIK. In figure 6 of my prepared statement, you see the way this budget breaks out by areas. Let me describe some of the areas to you.

The largest program element is in the strategic technology area. There we are concerned with the applications of high energy laser, over-the-horizon radar, and in so-called [deleted] studies for a variety of strategic tasks such as discrimination of warheads from decoys, terminal homing, and so on. These are some of the areas of science that are involved in the strategic technology program. We also have a program in nuclear monitoring research. This is an assignment that was given to us a number of years ago following the discussions in Geneva when it became clear that we were not fully able to detect and identify nuclear explosions in all environments. We are now centering around seismology, the study of elastic waves in the earth,

because a key problem in disarmament discussions has to do with the seismic verification of a treaty banning underground nuclear tests.

REPORTING OF FINDINGS

Chairman ELLENDER. You report your findings to Dr. Foster?

Dr. LUKASIK. That is correct.

Chairman ELLENDER. If there is a difference in viewpoint between you and Dr. Foster, who prevails?

Dr. LUKASIK. Dr. Foster.

Chairman ELLENDER. How does the authority of the Secretary of Defense relate to this?

Dr. LUKASIK. Relatively few issues come before the Secretary of Defense, since Dr. Foster is his assistant to watch over the R. & D. matters. On occasion, either results are sufficiently important that they are presented to the Secretary of Defense, or the Deputy Secretary of Defense immediately. In other cases, questions come up that require his judgment as to the best way to proceed.

Chairman ELLENDER. Who presents the few problems to the Secretary?

Dr. LUKASIK. They come several ways. In some cases, Dr. Foster will simply give us an assignment saying, "I want ARPA to do the following things," in which case we do it. In other cases, as a result of the things that we learn about what is going on either outside on the part of other countries or the technological possibilities, we recommend to him that we have a program, and in the course of the normal budget review process he agrees to some level of funding for some stated purpose. He usually writes down explicitly what he wants us to do, which area he wants us to work in, and that establishes our authority in that area.

ADVISER TO DIRECTOR OF RESEARCH AND ENGINEERING AND MILITARY SERVICES

Chairman ELLENDER. Would you say that ARPA is more or less an adviser to Dr. Foster?

Dr. LUKASIK. Yes; that is certainly one important part of our job. We advise him on new opportunities. We also advise him on some of the service programs because, to return to an earlier question of yours concerning how we introduce innovation into the Defense Department, one of the ways that we do is not by simply reporting the results to Dr. Foster, but by working with the military services. They serve as the group that writes the research contracts. They see the results at the same time so that we are not only an adviser to Dr. Foster, but we are also essentially an adviser to the military services; that is, the results of our research programs are known to them, and they usually affect the military service programs.

ASSIGNMENT OF SERVICE MISSION

Chairman ELLENDER. Dr. Foster's programs seem to be dominated by military thinking, as is evidenced by the 34,000 military personnel who are engaged in R. & D. activities, of whom 10,600 are officers.

I have been informed that ARPA was organized during the initial stages of the space effort, partly, perhaps, as a result of interservice rivalry. Are you acquainted with that?

Dr. LUKASIK. I am not acquainted with the details of what went on back in the mid-1950's, but it is certainly true that it is hard to get research done in the Defense Department when a service role has not been assigned. Now, in a case such as you describe, it wasn't clear—this was before the organization of O.D.D.R. & E.—it wasn't clear whether the problems of operations in space should be of primary concern to the Army, Navy, or Air Force. As a result there was no assigned service role, and therefore, they had no clear charter to do it. To avoid being held up in that way, ARPA goes ahead with the research without awaiting the assignment of the service mission.

ASSIGNMENT OF MISSIONS

Now, usually after the research proceeds to some point it becomes very clear to the services and the Office of the Secretary of Defense who should be doing it, who is going to profit most by it, who has the most important and compelling military missions. That is when a mission is assigned to a service and ARPA gets out of the business.

We did this, for example, in the ballistic missile defense research area where we were very active in the late 1950's and through the mid-1960's, but when it was very clear that the Army was going to develop an ABM system we transferred our work out of ARPA and the Army is now solely involved in that.

BALLISTIC MISSILE DEFENSE SCIENCE

Chairman ELLENDER. How did you assist in this prior to your withdrawal?

Dr. LUKASIK. In the early period, the ballistic missile defense problem was dominated by two major questions: One of them was if there is a warhead entering the atmosphere, and at the same time deployed around the warhead, there is a variety of decoys, chaff and so on, can you determine by radar or other means which one is the warhead and the one you have to go after. So that question of discrimination of warheads from decoys was a major one. ARPA contribution in high resolution radars was very significant.

The second question that was very important is how do you design a reentry vehicle, what materials do you make it from, and how do you construct it so that it will survive the reentry into the atmosphere. That gave rise to an area of science which has since been called reentry physics, study of the process that takes place when a body reenters the atmosphere. ARPA developed the basic science, the basic technology of reentry physics.

SCIENTIFIC PERSONNEL

Chairman ELLENDER. You have your own scientists. Are those the same scientists on whom Dr. Foster depends for information?

Dr. LUKASIK. We are all under Dr. Foster. We are part of the scientists that Dr. Foster employs. We are the group that was told to develop this area of science and we had a few people in ARPA who

did it, but we mainly did it with contracts with outside organizations. It was a large job and required many people. We had to study a lot about the physics of interactions in the upper atmosphere and when that was established we then got out of that area of science.

ROLE OF AGENCY

Chairman ELLENDER. What I am trying to develop is a justification for your existence. You are under Dr. Foster, you work for him, you get your data from the same source he gets his. I am wondering why it is that ARPA should continue.

Dr. LUKASIK. In the first place, the task I described is Dr. Foster's and we work for him. He employs us to discharge certain of his responsibilities. We are in no sense independent of him. We are helping him to do what he is supposed to be doing in the Defense Department.

Now, why should there be a separate agency not part of the military services, the passage in my statement, which I just read, indicates some of the kinds of things we do that are more appropriately done outside the services than inside the services. For example, this matter of when there isn't a service mission he doesn't know which service to give it to. We work on it long enough to advise him which service to give it to and we get out of the area of work.

Chairman ELLENDER. As I just indicated, Dr. Foster's whole force is dominated by the military, the same as yours is. You have military personnel on your payroll, paid by the Department of Defense. By the same token, Dr. Foster, as I said, has a contingent of 34,000 personnel, 10,000 of whom are officers. I am trying to determine the need for this agency.

AGENCY MILITARY PERSONNEL

Dr. LUKASIK. We find that the military officers in ARPA are very helpful, and are important in this process of transferring our programs over to the services. Rather than being a completely civilian agency, the presence of those military officers on our staff with their knowledge of the detailed operations of the services and the ongoing programs in the services are a very great help in transferring our programs.

As far as the basic reason for having ARPA, it is simply that there are certain things that should be done for the Defense Department that the military services are not able to do. It is important that they be done from Dr. Foster's standpoint but the military structure is not the best one to do it. The services can only work in the area where they have a mission. In new technology there aren't any weapons systems, we don't know what they are good for, so there isn't any assigned mission. It is an example of why none of the services launched the satellite back in the 1950's. That was a particular circumstance but that general situation exists today.

INTERSERVICE RIVALRY

Chairman ELLENDER. Is that because of a conflict among the three services?

Dr. LUKASIK. It is not because of a conflict.

Chairman ELLENDER. I was given the impression that the Army had the ability to launch a spacecraft prior to the launch of the Russian Sputnik. However, because the program had been given to the Navy, the Russians were able to achieve a prior launch.

Dr. LUKASIK. In this case there was a disagreement as to who should have the mission. There wasn't any space operation or mission in the services. Each of the services wanted that mission as a result, call it a conflict if you will, call it the lack of assignment of a task to the service—you see the services can't run independently, either. They can only work in areas where they have been assigned a mission.

The Army can't decide to have a Navy, and vice versa. So, until someone assigns that role to a specific service, no service does it.

Now sometimes that lack of assignment is because each service wants it and no one makes a decision. It is easier not to in some cases, but yet the work has to proceed, and therefore we do it.

Chairman ELLENDER. You will agree that Dr. Foster directs your program.

ASSIGNMENT OF MISSIONS TO SERVICES

Dr. LUKASIK. That is right. But he does not assign the missions to the services.

Chairman ELLENDER. Who does?

Dr. LUKASIK. The Secretary of Defense.

Chairman ELLENDER. What connection have you with him?

Dr. LUKASIK. Dr. Foster is under the Secretary of Defense. So that puts me under the Secretary of Defense too.

Chairman ELLENDER. Proceed.

AGENCY MILITARY PERSONNEL

Senator ALLOTT. May I ask one question on that, Mr. Chairman?

Chairman ELLENDER. Surely.

Senator ALLOTT. As I understand it, you have 125 people in Washington and 50 in the field.

Dr. LUKASIK. That is right.

Senator ALLOTT. These are approximate, they may not be exactly right. Of course, of those in Washington, 25 are military and in the field 30 are military. Out of the 175 employees you have only 55 who are military.

Dr. LUKASIK. That is correct.

Senator ALLOTT. Thank you.

Dr. LUKASIK. To return to my prepared statement.

EXPLORING, ANALYZING, AND INITIATING PROGRAMS

There are, to be sure, many people both inside and outside the Department of Defense who are working to achieve the best possible defense capability for this country. But since ARPA is independent of any direct military operational role and with no commitment to the maintenance and evolution of existing weapon systems, we are uniquely able to explore the frontiers of defense-relevant technology, to analyze the nature of possible new challenges, and to initiate such actions as may be required to prevent the erosion of our national security that would be occasioned by a technological surprise.

INITIATING AND TESTING PROGRAMS

Senator CASE. May I ask a question?

Chairman ELLENDER. Yes.

Senator CASE. You did insert the word "military" in the sentence?

Dr. LUKASIK. Yes.

Senator CASE. Is that your statement: "No commitment to the maintenance and evolution of existing weapons systems"? Does or does not this statement mean that you are a sort of devil's advocate to test and question the decisions that are made as opposed to initiating new things to do? Take, for example, the question of underground testing.

RESEARCH MANAGEMENT

Dr. LUKASIK. This is the case where our role is one of providing information. As you know, we support the program to develop the information base——

Senator CASE. You support the program. Who determines the program?

Dr. LUKASIK. When I say we support, we provide the money which goes out on contract to the organizations that are developing the information, the instrumentation, how to do a discrimination job, the basic facts of seismology, and so on. So we support that program. That is, we are responsible for seeing that the right people do the right research and we recommend the level of effort at which the program should be pursued.

Senator CASE. It is a management job.

Dr. LUKASIK. That is correct.

Senator CASE. What I am referring to is this: Do you or do you not have any function of continuous critical examination of existing programs or is that not part of your job?

Dr. LUKASIK. That is not part of our job. Now we watch over all of the military systems, both deployed and in R. & D., and worry about the gaps, the vulnerabilities, the things that may be wrong. To that extent we are critical of the system because we are trying to do better. On the other hand, when it comes to the management of a military system, that is Dr. Foster's job, not our job.

PROVIDING TECHNICAL FACTS

Senator CASE. When it comes to a question of "Is this necessary?" or "Is this the best way to accomplish the result?"—that is your job?

Dr. LUKASIK. We have an input early in the game. In other words, where there is a decision coming up, where there are technical facts that are part of that decision, then we are a group that provides those technical inputs. But we don't make the decision and after the decision is made we don't manage the weapons development program.

As I say, we are always looking at what we can do, what we will soon be able to do and worrying about what we can't do. We try to worry about next generation concerns. What happens when Soviet submarines get [deleted]. What happens if they develop a perfect decoy? What happens if they develop a way of launching sea-based missiles on depressed trajectories that minimize our warning time?

We are concerned with things like that. We go after technologies to fix them or ask the right questions. In fact, one of your earlier comments concerned our role in asking questions. I think that is a very important part of our function. We do tend to uncover issues by asking questions. We tend to ask the questions that would not otherwise get asked.

Since we don't have to maintain a system, sell a system, defend a system, evolve a system to the next generation, we are able to ask the question, Do you really want a tank? Is this the best way to move in this environment?

Senator CASE. That is what I am attempting to develop. I thought perhaps you were too ready to accept the suggestion that it was not part of your function to criticize continuously existing programs and determine whether they are still necessary—or if something else should be done instead—or whether there should be a leap into the next generation of development—or if everything that has been initiated should go undisturbed.

CONSTRUCTIVE CRITICISM

Dr. LUKASIK. Let me amend my comment. I would characterize my role as that of a constructive critic. Rather than simply saying "We don't think that system needs that fleet," or "We dont' think we buy enough of those," or "We don't think that is reliable enough, go fix it," what we do is take the approach of saying we are concerned that our forces may have a certain problem. To give a specific example, our forces must communicate under tactical circumstances but that reveals their position. We are concerned about that as a problem. We think that is a shortcoming in many of our military operations and systems. As constructive critics we try to improve the situation. For example, one of the aspects of our fiscal 1973 program is a program in [deleted] communication; how can forces in the field communicate under tactical circumstances [deleted]. In a sense, yes, that is being a critic of anyone who is building a [deleted] communications system.

On the other hand, it is constructive in the sense we are trying to develop the technology to eliminate a problem. We tend to focus on systems per se. We would not be a participant in, let us say, the ABM debate. If someone is going to deploy that we are not going to say that system does not have these characteristics. What we would do, for example, is provide the information that the physics behind the problems shows that is [deleted] will be confused by nuclear explosions. There is an example in a film I would like to show this morning where we discuss an experiment to test effect of ionization in the upper atmosphere on [deleted]. In one sense that is being critical of the program. In another sense, it is trying to find out what the facts are.

We try to make our role that of a neutral purveyor of information, but that usually means creation of information. That does not mean a staff function of arranging the information for presentation. It means pushing the frontiers to find out something. In that sense I will agree that we are critical of a lot of Government programs.

Senator CASE. Mr. Chairman, just one more question on this point.

ADVANCED RESEARCH

You mentioned the ABM. Would your agency consider whether this particular proposal is the best defense for land-based missiles? Would you consider a proposal that involves a criticism of the program? Would you consider the possibility of some other kind of defense being developed, of either mobility or some other kind of missile? How far do you go?

Dr. LUKASIK. These are the options that we should like to explore. Let me explain what our role is. What "advanced" in our title means is that we are doing the advanced research that we think the Defense Department will need.

Now, the Defense Department needs information for basically two kinds of reasons. Sometimes it is to design a weapons system. In other cases it is to reach a decision. Now, when you are faced with a decision you don't have time to do 5 years of research. So our role is to foresee in the relatively distant future, the 5- to 10-year future, the kinds of weapons systems that will be important, the kinds of questions that will be faced, and to do the research so that when the time comes that decision can be made.

SAFEGUARD

Now, the entire Safeguard debate involved many questions about the radars, the missiles, the characteristics of the reentry body, how could you discriminate, how many warheads could saturate the system, and so on. Basically, technical facts that were used in that debate were the facts that came out of the ARPA research program that was done in the time period 1959 to 1966. As a result of that research facts were available to design the system, first the Sentinel and later the Safeguard system, and also the facts in the debate as to whether the radars would or would not work, was information that came out of the ARPA program.

SUBMARINE VULNERABILITY

At that point we were not participants in that debate. That is Dr. Foster's job and that of other people in defense and other Government branches. But having gotten those facts out so that one knew what one wanted to do and one knew what the shortcomings were it was possible to have the debate, that is the kind of thing we do. We are concerned now about the question of submarine vulnerability. We are relying more and more on our undersea deterrent, and that is crucially dependent on whether or not you can find submarines. We feel it is important to explore every avenue to see whether there is any possibility that submarines can be detected and located. If after thorough painstaking search we come to the conclusion that there aren't any particularly easy or effective ways to do it, then that is an important fact, but not the only fact.

UNDERGROUND TEST BAN

The underground test ban is another example. Right now the debate centers around questions of how good are our present systems, what new systems could we deploy, what could we detect and identify, what

could the other side do in running a clandestine test. The facts of that debate come out of our program. But our position should be that of a neutral, that is, providing the facts and letting other people decide which of those facts they think are most relevant to the decision at hand. So we play the role of the neutral as well as perform some of the other kinds of tasks that I explained to Chairman Ellender where we are concerned with science and technology before it is assigned to a service. In other words, we are put to many purposes.

CONCEPT OF ROLE IN TERMS OF TIME

Senator CASE. Did you give me your conception of your role in terms of time? In other words, you said the debate about the antiballistic system, which took place during the last 4 or 5 years, is not a matter of your concern. But 10 years before that you laid out the problem and then went on to something else?

Dr. LUKASIK. That is right.

Senator CASE. From then on you had no further responsibility unless asked?

Dr. LUKASIK. That is correct.

MBT–70 AND XMA–03 BANKS

Chairman ELLENDER. Let's be specific on the other case, the MBT–70 tank. Did you have anything to do with that?

Dr. LUKASIK. No, we had nothing to do with that, that was and is Army matter. Dr. Foster hasn't addressed any questions to ARPA; he has relied on the Army for design of these systems. We have not been involved in that.

ANTITANK WEAPON

Let me give you an example of the kinds of things that we are doing in the fiscal 1973 budget that we have proposed which are relevant to this question.

We looked at the development of tanks and we noticed they really had not changed very much over many years.

Chairman ELLENDER. You refer to our tanks?

Dr. LUKASIK. Yes. In general, and other countries' tanks, too. They have larger engines, thicker armor, longer range guns, and so on. Look at the way you kill tanks: you have antitank guns and the warhead has to be able to penetrate armor to disable a tank. Now it strikes us, on looking at that kind of military technology situation, that the Defense Department has missed something in this whole thing. What they have missed is an approach to killing tanks that, rather than large antitank guns, would consist of light, cheap, man-portable kinds of systems, something that you can have a lot of. As tanks get more and more expensive the value of knocking them out becomes greater and greater, because they are increasingly expensive. If we could develop a very cheap antitank weapon it could literally remove tanks as a part of the military inventory. If I could find an inexpensive way to do it I could make it economically unfeasible for a country to have tanks.

Approach to Armor-Antiarmor Problems

If the other side does this it can be economically unfeasible for us to have tanks. That is the kind of questions we look into in ARPA, not whether that is the best tank, or the right price, but to look into the approach to armor, antiarmor problems.

If we can find out something that people are missing or not developing for one reason or another, then that is a net gain. It might have the effect of removing a system rather than adding a system.

A–X and Cheyenne Controversy

Chairman Ellender. What did you have to do with A–X and Cheyenne systems?

Dr. Lukasik. We have not been involved in either the A–X or the Cheyenne controversy. That is not something that Dr. Foster has asked our assistance on.

Chairman Ellender. Proceed.

Soviet Space Capability

Dr. Lukasik. This role was assigned to ARPA when it was established in 1958. At that time, the United States was faced by a new technology and a new challenge, the sudden and dramatic appearance of a Soviet capability in space. ARPA was the instrument by which this country organized to rise to that challenge. Within a few years, the U.S. space program had been initiated within ARPA and transferred to the newly organized National Aeronautics and Space Administration and the three military services. This mode of operation, initiation of programs, and transfer to the service at the earliest possible time, is an essential characteristic and is crucial to our effectiveness. While our first task has long since been successfully completed, our basic assignment of assuring that the implications of emerging new technologies are not ignored remains as important now as it was then.

It is my purpose today to review for you what we see as the major areas of potentially important advanced technology and the actions we propose to take to understand those technologies. I will discuss how we work within the existing service structure to execute the program taking into full consideration other activities within the Government thereby avoiding duplication of effort. And finally, I will review our record of transfer or termination of programs in ARPA.

Proposed 1973 Program

The ARPA research program centers around nine program elements. The first of these, Defense Research Sciences, is a 6.1 element and is divided, for internal management purposes, into three key research areas where we believe that ideas having a major impact on our defense posture are likely to arise: materials sciences, human resources research, and information processing techniques.

ACCOUNTING SYSTEM: DIVISION OF EXPENDITURES INTO CATEGORIES

Senator CASE. What is 6.1 and 6.2?

Dr. LUKASIK. The research program is referred to as package 6. It is divided into a number of areas; 6.1 is basic research.

Senator CASE. Why is it 6.1? Why not some other number? What kind of category or classification is it, and who makes the classification?

Dr. LUKASIK. It is an accounting system that, I believe, was introduced by Mr. McNamara where various expenditures in the Department are divided into categories.

Senator CASE. You mean the whole expenditure of defense funds is broken down into these numbered and subnumbered categories?

Dr. LUKASIK. That is right.

Senator CASE. What is No. 1?

Mr. WOODRUFF. Strategic forces.

Senator CASE. No. 6 is——

Dr. LUKASIK. Research.

Senator CASE. This is something internal to the Defense Department?

Dr. LUKASIK. That is right.

These are further subdivided into the subelements shown in figure 1, all of which are described in detail in the set of descriptive summaries that has been prepared for your use.

1972 APPROPRIATION AND 1973 BUDGET REQUEST

Chairman ELLENDER. How much is involved in this work?

Dr. LUKASIK. The amount for the sum of these three offices is shown in the budget as $40.7 million.

Chairman ELLENDER. How does that compare with the funds for last year?

Dr. LUKASIK. That is up by $3.9 million. Last year it was $36.8 million.

CONTRACTORS

Chairman ELLENDER. Is this handled by your own people or do you let out a contract to get the answer?

Dr. LUKASIK. All that money goes out on contract. All $40.7 million goes out to contractors.

Chairman ELLENDER. Who are those?

Dr. LUKASIK. Those contractors in the 6.1 area are, mainly, university contractors, about three-quarters of them, although some of the money goes to industry. For example, in material sciences we are developing a high temperature ceramic-based gas turbine where a combination of Ford and Westinghouse are our contractors. About half of the research in material sciences goes to industrial contractors and about half to universities.

Chairman ELLENDER. How do you select the colleges to whom you pay this $40.7 million? Do you give them a project?

Dr. LUKASIK. This number came about as the sum of the amount that we want to spend in areas where we already know people want to work. In other words, they come to us with proposals. Sometimes we

have gone to them and solicited proposals. In most cases it is unsolicited proposals. This represents the amount of money we feel is necessary to support those ideas that are worthwhile and that are appropriate for ARPA to support.

Use of Ceramics in Gas Turbines

Chairman Ellender. Do you develop subjects on your own that you want to have studied by the colleges?

Dr. Lukasik. Yes. In this case we were independently interested in the idea of using ceramics for gas turbines because if you use ceramics you can increase the temperature at which the engine operates. As a result you can get much greater efficiency and that translates into more range or more payload which has obvious military virtues.

Now no one has made a ceramic turbine because it was believed that the material was too difficult to work with, to shape into the precise parts that are needed in a gas turbine. But we persisted and we said we think it is a very important thing and we don't think it is that hard and we found people who are willing to undertake this job.

Now, what we, in fact, found is that there was some capability, people in Ford and Westinghouse had been thinking about it. Westinghouse builds large turbines for power generating stations and Ford is interested in engines to replace the internal combustion engines in vehicles and they also had been thinking along these lines.

So we felt that they were the best people to undertake this. They had done some preliminary studies.

Chairman Ellender. They did that on their own?

Dr. Lukasik. They did that on their own; that is right.

Chairman Ellender. What success have they had so far?

Dr. Lukasik. The program has been running about a year. I visited them about a month ago. They have fabricated the combustion chamber, they have fabricated some blades and found a way to fit them together to form the rotors that compress the gas. They are making fundamental materials. That is the reason it is in material sciences. There is a lot of science that has to be done to get the information that an engineer needs to develop an engine.

Chairman Ellender. When you hire people in that manner, do they continue to contribute their own money?

Dr. Lukasik. Yes; in fact there will continue to be an input. In this case it is taking the form of a lower overhead rate charged the Government so that over the course of this program there will be several million dollars, in effect, of Ford and Westinghouse money continuing to be put into the program.

Senator Case. What kind of material are they using?

Dr. Lukasik. It is a ceramic material, it is a silicon carbide material. They have also looked into the nitrides as a material but they have fixed on the carbides as being the more promising materials.

Strategic, Tactical, Surveillance, and Information Systems

Next, there are six 6.2 program elements which are shown with their important subelements in figures 2 and 3. Each of these represents an area of development activity directed to major aspects of defense: strategic, tactical, surveillance, and information systems.

Chairman Ellender. How much are you asking for this program?

Dr. Lukasik. The sum of the six 6.2 program elements is about $180 million.

Chairman Ellender. What did you spend last year?

Dr. Lukasik. We spent about $168 million last year.

Chairman Ellender. With what results?

Information System Computer

Dr. Lukasik. Let me describe something in the distributed information system subelement. What we have been doing is building a computer which is based on a wholly new and different way of organizing calculations. During fiscal year 1972 that program, which has been running for several years, has essentially been completed. The machine will be shipped from the manufacturer next month and installed and set up in an operating location to do very sophisticated calculations for the Defense Department.

Air Cushion Vehicle

In the case of Advanced Engineering, in the film that I will show we have made measurements on a surface effect vehicle. This is also called an air cushion vehicle or hovercraft. We are developing it as a new approach to mobility in the Arctic. We have made tests on that vehicle and understand the relationship between the environment and the whole system that is necessary to develop such a vehicle.

Elevated Sensors

In the area of advanced sensors, we are just completing testing on a tethered balloon that will be used to elevate sensors to altitudes of the order of [deleted] to do standoff sensing, radio relay tasks, intelligence collection, and so on.

Seismic Array in Norway

In the area of nuclear monitoring research, we have continued our support of seismology. We have completed a large seismic array in Norway which is now beginning to yield information that is very important from the standpoint of comprehensive test ban discussions because it will help us to understand what kind of worldwide monitoring system needs to be constructed if we have such a treaty.

High Energy Lasers

In the area of strategic technology we have developed high energy lasers. We now have lasers that are operating at [deleted] and we are exploring their applications for new weapons systems.

The laser area is very typical of the kinds of things we do. Here is a case in which several years ago it became clear that one could build lasers to achieve very intensive beams. Now the question is, are such beams useful as a weapon and, to pursue the matter further, what particular military missions are they good for and which military service

should have primary cognizance of lasers, and which military service would profit the most from lasers. The program has been running in ARPA, we have been pushing to the very highest energies. As a result of our development program, several military applications are becoming clear. As a result of this program now, the Air Force is undertaking development of an airborne laser [deleted]. The Navy is interested in a shipborne laser because they think it is a very promising approach to the question of defense of surface ships [deleted].

DEVELOPMENT OF BASIC SCIENCE

Here is a case where we are doing the central development to find out what applications are feasible. The Army also has potential application for battlefield air defense. We are developing the basic science, the basic technology, and when a military application becomes clear the services are pursuing specific programs and doing the engineering to fit that device into their requirements.

But we are leading the field in this development, we are the central point for doing it instead of having three separate services, each trying to understand the basic physics of this, we are doing it and feeding it to the services and they can go ahead and apply the results.

Now I call attention to these descriptive summaries where for each subelement, some 45 subelements, the accomplishments are shown in detail. I just indicated some of the highlights that are particularly illustrative of ARPA's purpose.

Chairman ELLENDER. Proceed.

TACTICAL WARFARE AND SURVEILLANCE

Dr. LUKASIK. For convenience in internal management, two program elements address tactical warfare problems, one land combat oriented—tactical technology—and one marine-oriented—advance engineering. The surveillance area is covered by three program elements; nuclear monitoring is an outgrowth of an early ARPA assignment in nuclear test ban related research while the advanced sensors project addresses a broader range of surveillance programs. Important aspects of the strategic surveillance missions are addressed as part of the strategic technology program element.

TECHNICAL STUDIES

Finally, there is a 6.2 program element—technical studies—that provides for research of an overview nature of direct concern to the Director of ARPA and D.D.R. & E.

AGENCY INTERNAL OPERATION

A 6.5 program element contains the funds to support the internal operation of the Agency.

Chairman ELLENDER. What is the source of that funding request?

Dr. LUKASIK. For the 6.5 program element?

Chairman ELLENDER. Yes.

Dr. LUKASIK. That is part of this $227 million R.D.T. & E. appropriation that is proposed.

Chairman ELLENDER. I have a note here indicating that prior to fiscal year 1972, a certain portion of ARPA's cost was paid from "Operation and Maintenance, Defense Agencies" appropriations.

Dr. LUKASIK. That is correct.

Chairman ELLENDER. Is that in addition to——

ESTABLISHMENT AS SEPARATE AGENCY

Dr. LUKASIK. No. Until this fiscal year the funds for the internal support of ARPA, travel, and the salaries, came out of the O. & M. budget of the Office of the Secretary of Defense. This year ARPA has been established as a separate agency. It has been removed from the rolls of the Office of the Secretary of Defense in the way that its charges, its personnel are allocated. The O. & M., instead of coming out of the OSD O. & M. budget, is being paid out of the R.D.T. & E program that Congress appropriates.

Chairman ELLENDER. I presume that accounts for the increase that was asked for Dr. Foster.

Dr. LUKASIK. That certainly——

Chairman ELLENDER. What would that amount to?

Dr. LUKASIK. This represents a transfer from one on the order so that the O. & M. budget should go down by this amount and the R.D.T. & E. budget should go up; $3.7 million is the amount.

Mr. BEARD. In prior years about a million and half dollars of that came of R.D.T. & E. overseas. That is, we have always paid salaries and support overseas out of R.D.T. & E. Beginning this fiscal year the entire amount of support, salaries and so forth, come out of R.D.T. & E.

ROLE OF AGENCY

Dr. LUKASIK. It will, I think, be useful to review the relationship between ARPA and the Director of Defense Research and Engineering and the way in which the information derived from ARPA programs feeds into the services and the decisionmaking process within O.D.D.R. & E. All projects in ARPA have been explicitly assigned to us by D.D.R. & E., and I report directly to the Director of Defense Research and Engineering. When a project has been assigned to us and a satisfactory plan of action formulated by ARPA, the work is undertaken by one or more performing organizations. These may be industrial, university, in-house DOD or other governmental laboratories, or a not-for-profit organization. In all cases the implementing directive is an ARPA order to a Government organization authorizing the expenditure of ARPA funds for specified research tasks, either by the recipient directly or by means of contracts with non-Government organizations selected to carry out the research. Some statistical details of this process are shown in figure 4.

BREAKDOWN OF RESEARCH BUDGET REQUEST

Chairman ELLENDER. How much have you spent on this program?

Dr. LUKASIK. This represents the entire ARPA program. This is the way we work.

Chairman ELLENDER. The $227 million you are asking——

Dr. LUKASIK. Is all described by that paragraph.

Senator CASE. Excuse me, Mr. Chairman. Is there any place where the budget is broken down not by organizational components but by the system described?

Dr. LUKASIK. Figure 6, Senator Case.

Chairman ELLENDER. That is part of your justification.

It might be apropos to put this in the record following your last statement.

Dr. LUKASIK. Yes.

(Figure 6 follows:)

PROPOSED ARPA PROGRAM

Program element	Title	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 proposed
61101D	Defense research sciences	$41.5	$36.8	$40.7
	Materials sciences	(20.0)	(15.4)	(18.0)
	Human resources research	(5.3)	(5.8)	(7.6)
	Information processing techniques	(16.2)	(15.6)	(15.1)
62301D	Strategic technology	65.0	71.9	78.6
62701D	Nuclear monitoring research	36.4	35.9	30.7
62703D	Advanced sensors	17.8	8.5	13.4
62702D	Tactical technology	18.4	15.3	16.1
62105D	Advanced engineering	10.6	12.8	13.2
62706D	Distributed information systems	12.5	18.9	24.2
62101D	Technical studies	6.6	6.1	6.1
65801D	Project management support		3.7	3.7
	Total	209.0	210.0	226.7

PROGRAM ELEMENT

Senator CASE. Is there a chart that shows each of the items in each of these categories?

Dr. LUKASIK. You mean a further breakout of details?

Senator CASE. The Defense Department is all broken down this way?

Dr. LUKASIK. That is right. Each line item has a number. Quite frankly, I have only been concerned with the first digit because that indicates the degree of applied or fundamental character of the research. The remaining digits are assigned by the Comptroller's office. There is undoubtedly some system but I am not familiar with it.

Senator CASE. By taking the same number throughout the whole budget, one may find out all the research and development going on in every branch.

Dr. LUKASIK. For example, all program elements numbers having 2 as the second digit are exploratory development. You can ask for various kinds of breakdowns.

Senator CASE. Throughout the whole service?

Dr. LUKASIK. That is right. Every bit of our money is identified by some program element, some line item.

Senator CASE. The key words here are "program element."

Dr. LUKASIK. Program element is the thing that identifies the line in the budget.

ACCOMPLISHING RESEARCH OBJECTIVES

Three important results crucial to the success of ARPA derive from this way of accomplishing our research objectives. First, the work is often supervised and even performed by those organizations which benefit most directly from the results of the research thereby solving

the problem of information transfer to the services. Second, the work can be performed by the best qualified organization regardless of its location within the Defense Department or even the entire U.S. Government. And third, by not being burdened by its own in-house research facilities and procurement office, ARPA can remain a small group of highly qualified professionals thereby retaining its flexibility to take on new assignments in response to changing Defense priorities and minimizing the bureaucratic weight that tends to stifle innovation.

BUDGET REQUEST CONSTANCY

Some characteristics of our organization are shown in figure 5. Note that aside from the initial startup of the space program in fiscal year 1959, the ARPA budget has remained in the $200 million to $300 million range, fluctuating in response to changing assignments to the organization. At the present time we manage a $210 million program involving 850 contracts with a staff consisting of 45 civilian professionals, 24 military professionals, and 46 support personnel in Washington. There are another 54 people in ARPA field activities outside Washington. This staffing level has also tended to remain constant over the last 10 years. With a staff of this size and a program level in the above range, we find that we are able to discharge our assigned responsibilities to D.D.R. & E. successfully. Such a budget provides us with sufficient resources to explore carefully selected areas of research at an above-critical level. At the same time the budget is sufficiently small that the ultimate dominance of the services in the weapon system design and acquisition process is assured. In this way and as a result of the transfer mechanism, an effective and fruitful relationship between ARPA and the services is obtained.

The proposed amounts for fiscal year 1973 for each program element are shown in figure 6 along with the corresponding numbers for fiscal year 1971 and fiscal year 1972.

Senator ALLOTT. I have looked at figure 5, which you have attached here. I note two things about it. First, the very high rise in the appropriations in fiscal years 1958 and 1959, and then the very sharp fall off thereafter. I presume that was the result of transferring the space program to NASA at that time?

Dr. LUKASIK. That is correct.

Senator ALLOTT. Then I have this question to ask: You have remained at the $210–$220 million funding level—in fact you are at a lower level now than you were back in 1965. You are at the same level as you were in 1962.

Dr. LUKASIK. That is correct.

BUDGET REQUEST IN CONSTANT DOLLARS

Senator ALLOTT. Have you ever figured out what the $227 million would mean in constant dollars?

Dr. LUKASIK. I don't have that number but at an inflation rate of 5 percent a year, operating over a 10-year period, that represents a significantly lower level of effort.

Senator ALLOTT. Of course, the inflation rate compounds itself as we go along from year to year. But if we were to take a flat arithmetic

inflation of 50 percent over the 10 years, then your $227 million represents approximately $112 million in constant dollars.

Dr. LUKASIK. Yes, sir.

Senator ALLOTT. Which is less than you have ever had, except for the first year of 1958.

Dr. LUKASIK. That is right.

Senator ALLOTT. Thank you very much.

HUMAN RESOURCES RESEARCH AND MATERIALS SCIENCES

Dr. LUKASIK. There is an increase in the defense research science area of $3.9 million or by 11 percent. This is somewhat in excess of the 8-percent increase over fiscal 1972 proposed for ARPA as a whole and reflects the importance we attach to maintaining a strong science and technology base. Examining this in detail we see that the total change is the result of a relatively large increase in human resources research and materials sciences and a small offsetting reduction in information processing techniques. The major part of the increase in human resources research is accounted for by a new effort to explore the application of newly available educational technology to service programs in order to decrease the instruction cost and student time involved. In materials sciences the increase is in the area of power systems, mainly for the high temperature ceramic turbine. This is to some extent misleading, however, since the program was initiated late in fiscal year 1971 and required minimal funding in fiscal year 1972. In information processing techniques the small decrease takes on more significance when the trend from fiscal year 1971 is examined. There has been a continual decrease in this area of basic computer science research and an increase in the corresponding 6.2 program element, distributed information systems. This reflects an exploitation of previous year's basic research results and their development for increasingly critical defense requirements in communication, high-speed computation, secure time-shared systems, and advanced signal processing.

STRATEGIC TECHNOLOGY

The increase in the strategic technology area is at the same 8-percent level as for ARPA overall. The increase is concentrated in three particularly promising areas of technology; high energy lasers in the [deleted] power range, techniques for [deleted] and in infrared, optical, and radar techniques required for a search and identification capability against [deleted].

NUCLEAR MONITORING RESEARCH

The 14-percent decrease in the nuclear monitoring research element is accounted for by planned reductions in two successfully completed areas of past emphasis. One is to learn ways of discriminating between earthquakes and explosions and ways of conducting clandestine nuclear tests, both programs being in support of U.S. discussions on the subject of a ban on the conduct of underground nuclear tests. The other area is the development of techniques capable of yielding detailed information about the degree of technical sophistication of for-

eign nuclear devices on the basis of long-range observations of their tests. The other area is the development of techniques capable of yielding detailed information about the degree of technical sophistication of foreign nuclear devices [deleted].

ADVANCED SENSORS

The larger percentage increase in advanced sensors follows from two causes. First, major efforts in earlier years to apply advanced sensor technology on a quick reaction basis for Southeast Asia came to an end by fiscal year 1972. The program is returning to its original goal of exploring fundamental sensor technology for a wide range of intelligence and tactical surveillance problems. Also, with the termination of the defense special projects group at the end of fiscal year 1972, the advanced sensors project will assume complete responsibility for exploratory development in the area of standoff sensing and advanced battlefield sensor technology.

TACTICAL TECHNOLOGY

There is a relatively small 5-percent increase in tactical technology following a complete redirection of this project away from counterinsurgency research, including the phasedown of several of its field activities, and toward a more broadly directed program in land combat technology. Small increases in the areas of small arms, target acquisition, tactical delivery systems, and low cost system technology are balanced by the completion of programs in counterinsurgency, counterpart development, and small independent action forces.

ADVANCED ENGINEERING

There is an even smaller increase, 3 percent, in advanced engineering where several new programs initiated within the past 2 years continue on a more or less constant level of effort basis.

DISTRIBUTED INFORMATION SYSTEMS

The 28-percent increase in distributed information systems was discussed previously in connection with the change in emphasis between the 6.1 and 6.2 types of activity in the computer sciences.

TECHNICAL STUDIES

Technical studies in shown to remain constant although it can be expected to decrease in fiscal year 1973 below the level shown. This will be the result of internal reprogramings of funds into one of the other program elements as appropriate for the preliminary investigation of possible new ARPA programs. Also no increase in the funding required to support the operation of the Agency is anticipated.

ADVANCED ASSAULT LANDING CRAFT

Chairman ELLENDER. Just how does your effort in field activities compare with what the Navy is doing?

Dr. LUKASIK. We are in very close contact with them. In fact, this is a good example of how this idea of doing our research and contract-

ing through the services works very well. The agent, the Government organization that lets the contracts and monitors those contracts, is the same Navy organization that is doing the research on the two Navy programs in this area. One of them, with which I am sure you are familiar, is the advanced assault landing craft which is a small, short-range, amphibious vehicle to transport troops and materiel between ships and nearby land.

SEAGOING SURFACE EFFECTS VEHICLE (LOGISTICS CARRIER)

The other is a larger seagoing, not amphibious but seagoing, surface effects vehicle to use as a logistics carrier.

Chairman ELLENDER. What did you have to do with the studies that led to the award of the two prototypes?

Dr. LUKASIK. We did not have any direct input to that program, although we are familiar with it. Our program is related to developing the technology so that such vehicles can be used in the arctic environment. That means two things: First of all, the vehicle has to be amphibious because the arctic includes snow, ice, water, tundra, mud; a wide variety of surfaces. It also has to operate under more difficult conditions, low temperatures, and so on. So that we are trying to increase the utility of such devices.

PROGRAM EVALUATION

Chairman ELLENDER. Are you ever asked to evaluate certain programs?

Dr. LUKASIK. Yes; we are on occasion.

SURFACE EFFECTS SHIPS

Chairman ELLENDER. Have you studied the program involving the development of two prototype surface effects ships?

Dr. LUKASIK. I am familiar with that. While I am not familiar with the details of the particular device that the Navy proposes, I think that fundamentally it is a good idea to see if you can build such vehicles. You have to have relatively large payloads to undertake the Navy missions. This is the most promising concept for high-speed ships. One of the things that limits the performance of naval ships is their speed. That in turn is limited by the rate at which a body on the surface can move through the waves that it encounters.

The surface effects vehicle by standing off the surface and skimming over the surface is potentially able to go much faster. One can show in certain operations like ASW, or escaping from submarines, whichever side you view it, speed is an absolutely crucial characteristic.

The first side that develops significantly higher speed ships will eventually control the seas if they choose to deploy them. So I think that the Navy is well advised to pursue this. Of course, this is not the only avenue that they are pursuing. They are also looking into hydrofoil ships.

HYDROFOIL COMPARED WITH CUSHION SURFACE EFFECTS VEHICLE

Chairman ELLENDER. That was the next question I wanted to ask you. Compare the hydrofoil to the cushion surface effects vehicle.

Dr. LUKASIK. I think inevitably the hydrofoil ship is going to be limited in the ultimate size. What you are basically doing is taking something that weighs 5 tons or a thousand tons or several thousand tons and you are supporting it on a few foils, on a few surface-piercing elements. That is a difficult construction problem.

You can imagine the impact loads as this goes through waves of varying heights and receives various sorts of impact loads.

Now a surface-effects vehicle, since it is supported by a large area, relatively low pressure, is supported uniformly. A surface-effects vehicle is supported virtually as uniformly as the displacement of the ship.

Chairman ELLENDER. Wouldn't the wave action affect stability in the same manner as in the hydrofoil?

Dr. LUKASIK. It would not affect it to the same extent because what you do is lift it up off the surface. You have some sort of skirt system. In the case of so-called rigid sidewall devices, you are right, those rigid sidewalls would take wave impact loads. I think in general the problem of moving at high speed through waves will be easier with the surface-effect vehicle.

RESEARCH PRIOR TO ESTABLISHMENT OF ARPA

Chairman ELLENDER. Was ARPA consulted as to how best to proceed on these?

Dr. LUKASIK. No. The Navy started to think about both of these approaches to these high-speed ships in the late 1950's. Both of those programs were underway when ARPA was established. Since that time the Navy has pursued these and we have not felt that it was necessary to make any major improvements in the Navy program.

Chairman ELLENDER. It started with the hydrofoil, did it not?

Dr. LUKASIK. The start was on hydrofoil. About 5 years later the surface-effect vehicle concept was pursued more aggressively.

Chairman ELLENDER. Off the record.

(Discussion off the record.)

Chairman ELLENDER. On the record.

You may proceed, sir.

MANAGEMENT CHANGES AND TRENDS

Dr. LUKASIK. The various changes in funding levels discussed previously arise as the result of perceived changes in defense needs by ARPA and as a response to congressional concerns. A number of these have been mentioned implicitly in the preceding, but it will be worth while to consider these from the standpoint of the Agency as a whole and, at the same time, highlight certain areas of past congressional concern.

The 6.1 basic research program element has been internally reorganized in response to the concern over defense relevance. In the materials sciences area this has taken the form of centering attention around such application areas as power sources, structural materials, laser materials, et cetera. We feel that this change does not do violence to the quality of the fundamental science involved but it does serve to channel the thinking into more rather than less utilitarian lines. With the transfer of the interdisciplinary laboratory program to the National Science Foundation this year, the change in orientation of this area of research in ARPA will be enhanced.

INFORMATION PROCESSING TECHNIQUES

A similar change has occurred in information processing techniques where areas such as automatic computer programing, picture processing, and speech understanding serve as focuses of effort. A more fundamental change occurred in fiscal year 1971 when the 6.2 program element, distributed information systems, was established to provide for the transition of results from the basic research area into exploratory development.

HUMAN RESOURCES RESEARCH

The most fundamental change has occurred in the area previously called behavioral sciences and now called human resources research. Previously, the program had several characteristics that caused concern: research in foreign areas, research too closely related to political science, or policy studies more appropriately undertaken by agencies outside defense and research of such long-range nature that its direct military relevance was difficult to perceive. Research in the above areas has either been terminated or its initiation in the State Department encouraged by the transfer of funds for programs of mutual interest. The program now is related to problems of direct defense impact including individual performance under stress, advanced training technology, basic manpower utilization research, and ways of improving defense decisionmaking. The emphasis on manpower research in ARPA, fully coordinated with the Assistant Secretary for Manpower and Reserve Affairs, is consistent with a directly expressed congressional recommendation.

COUNTERINSURGENCY, PROJECT AGILE

There has been continued concern expressed over ARPA work on counterinsurgency, Project AGILE, and the ARPA role overseas. Funding for Project AGILE has been decreasing since fiscal year 1971; the fiscal year 1973 level proposed, $1.8 million, will be to complete remaining efforts in this area. Current funding is related to the development of military R. & D. "counterpart" organizations in Vietnam, Thailand, and Iran, and represents the discharge of an obligation incurred a number of years ago. In all cases funding for the counterpart organization is being assumed by the foreign government, transfer of equipment and facilities is underway with the assistance of the State Department, and residual advisory responsibilities are being assumed by the local military assistance advisory group.

Chairman ELLENDER. Will you tell us how much you have spent since Project AGILE was initiated?

Dr. LUKASIK. I will have to supply that for the record.

(The information follows:)

Fiscal year:	*Millions*
1962	$6.5
1963	23.3
1964	25.2
1965	22.1
1966	30.1
1967	29.3
1968	26.5
1969	22.1
1970	9.9
1971	7.1
1972	4.3

AGENCY ROLE OVERSEAS

Chairman ELLENDER. Proceed.

Dr. LUKASIK. With respect to the broader question of the ARPA role overseas, we see, with the termination of the counterinsurgency work, a substantial phasedown of this type of activity. There will, of course, be exceptional circumstances where a foreign performer will be involved in an ARPA program; many ARPA programs in surveillance and tactical technical technology involve international cooperation for data exchange, the joint use of facilities; and it will continue to be necessary for ARPA to maintain close contact with U.S. commanders overseas to assist in guiding the direction of our program. I anticipate that these will require the presence of a small number of ARPA personnel overseas, but I see such activities as being ad hoc assignments to meet specific needs rather than leading to permanent overseas establishments.

DISTRIBUTION INFORMATION SYSTEMS (DIS)

The growth pattern of the distribution information systems (DIS) program element deserves some further comment. Since its establishment in fiscal year 1971, this element has increased substantially as more and more efforts centered in information processing techniques entered a more expensive phase of exploratory development. I expect this process to continue over the next several years. However, further funding increases will not be as marked as the trends since fiscal year 1971 because of the transfer characteristic of ARPA. By fiscal year 1974 one can expect to see transfers out of DIS and into service programs funded from other sources so that a more normal balance of new ideas in and completed programs out will occur.

DEFENSE SPECIAL PROJECTS GROUP: TERMINATION

The termination of the Defense Special Projects Group directed by Congress in the fiscal year 1972 authorization is underway and appropriate research elements are in process of transfer to ARPA. This, as noted previously, is one reason for the funding increase in the advanced sensors program element. As the details of this process are worked out, you will be kept apprised of the results.

INTERNAL AGENCY OPERATIONS

You will note the appearance of a program element to support the internal operation of ARPA. This is the result of a Secretary of Defense decision to establish ARPA as a separate agency more in line with its role as an implementing agency rather than as a staff organization. At this time the full implications of that move are not clear since the required directives have not been officially approved. No appreciable growth in the size of the agency is contemplated, however. One can expect that a more complete report will be possible as part of the program to be proposed for fiscal year 1974.

UNOBLIGATED FUNDS

A subject of mutual concern has been the question of unobligated funds in ARPA. Figure 7 gives our unobligated balance at the end of

each fiscal year shown, along with projections for fiscal year 1972 and fiscal year 1973. The natural conclusion is that such funds were not needed in the year in which they were authorized and appropriated since their obligation was delayed until a time when the next fiscal year's funds could have been made available for the intended purpose.

Chairman ELLENDER. When do those unobligated funds go back to the Treasury?

Dr. LUKASIK. Unobligated funds that are more than 2 years old revert to the Treasury.

The problem arises as the result of several factors; it takes, on the average, about 3 months to write a contract or contract amendment, less if it is a straightforward extension or addition of a fund increment and more if it is a new contract, especially in the case of a competitive procurement. The ARPA practice of relying on service contracting offices, while advantageous for the reasons discussed earlier, can add somewhat to the time involved and in some cases the contracting office is less responsive to ARPA needs than it is for its own service workload.

"NO-YEAR" NATURE OF AGENCY FUNDS

Also, the "no-year" nature of ARPA funds naturally lead the service agents to give preference wherever possible to service funding actions. And, finally, the ARPA pattern of activity was to commit its funds at roughly a constant rate through the fiscal year in order to distribute this workload uniformly. The combination of these factors is the reason for the very large ARPA unobligated balance of $89.4 million in fiscal year 1967 and prior years. Since our program was $272 million that year, it means that on the average, no ARPA funds committed to the agents during the last 4 months of the fiscal year were obligated.

CHANGING PATTERN OF FUND COMMITMENT

The solution has been simply to change the pattern of fund commitment to the first half of the fiscal year, thereby assuring in all cases, except a few troublesome contract negotiations that always materialize, that all the funds will be obligated by the end of the fiscal year in which they are appropriated. The gradual nature of our response to this problem has been the result of having to try successively more stringent measures to affect the unobligated balance. The "system", even ARPA's, has proven to be remarkably resistant to change. But I anticipate that as a result of the emphasis that it has received this year in response to congressional action on the fiscal year 1972 budget, that the goal shown will be achieved.

FUNDING CONTRACTS TO MID-1973

There will be a further decrease in fiscal year 1973 since we are, in all but a few exceptional cases, funding contracts only to mid-1973 with fiscal year 1972 funds. This is again consistent with congressional guidance as we understand it. This will finally force virtually all fiscal year 1973 funding actions into the first half of the fiscal year. There is an unavoidable level of a few million dollars as a result of fund deobligations arising from final settlement of completed con-

tracts. It should be noted that these deobligations will come from current and previous year funds; moneys more than 2 years old automatically revert to the Treasury under the new law.

TRANSFER OR COMPLETION OF AGENCY PROGRAMS

I would like to return to the question of transfer or completion of programs in ARPA. It is instructive first to view the process statistically. Of the $210 million of programs in fiscal year 1972, 18 percent or $36.8 million will not be funded in fiscal year 1973 and beyond. Similarly, of the programs in the $226.7-million fiscal year 1973 budget, 20 percent or $45.0 million will be new, and hence will not have been funded in fiscal year 1972 or earlier. What these numbers say is that if 20 percent of the ARPA program "turns over" each year, then the average life of a program in ARPA is 5 years. This is a turnover rate that is about right for an organization like ARPA. Longer than that and the program is staying in its "incubator" too long, shorter than that and it is hard to see how any substantive technical achievement is possible. For tasks of the magnitude, uncertaintly, and difficulty that ARPA undertakes, it usually takes this amount of time to plan and organize the work, research or develop the subject, and analyze the results of the program. One should keep in mind, however, that this is an average value. Some programs pass through ARPA more quickly and some remain in ARPA longer than 5 years. An example is the VELA effort which was an extremely difficult problem.

FEDERAL CONTRACT RESEARCH CENTERS (FCRC)

A final area of special concern is the amount of research undertaken in the Federal contract research centers—FCRC. In fiscal year 1971 ARPA spent about $20.2 million in these organizations, 58 percent of which—$11.7 million—was in RAND and IDA. In fiscal year 1972, in response to congressional guidance to reduce our efforts with these organizations, this amount decreased to $10.2 million, or by 13 percent. By the end of their current contract year, these organizations will have cut their level of effort by the required 25 percent. The level of ARPA research projected for these two organizations for fiscal year 1973 is reduced from fiscal year 1971 by essentially 25 percent for a total of $9 million. In effect, this says that ARPA is proposing a level of effort for fiscal year 1973 that is equal to the level that these organizations will have reached by the end of the current contract year as a result of the fiscal year congressional reductions. In fiscal year 1973 we will have completely terminated our work in RAC, CNA, and HUMMRO. We do plan to continue work in Lincoln Laboratory, Johns Hopkins Applied Physics Laboratory, MITRE, and Aerospace at about the same manpower level as in previous years. We do not plan to do any work in FCRC's with which we have not previously had programs.

RESEARCH ANALYSIS CORPORATION

Senator SYMINGTON. What is RAC?

Dr. LUKASIK. Research Analysis Corporation. It is an Army-sponsored FCRC.

Senator SYMINGTON. Wasn't ARPA conceived once as an Army unit?

Dr. LUKASIK. No; to the best of my knowledge, it was not. In its early days it had a sole interest in space and strategic technology.

CNA AND HUMAN RESEARCH RESOURCES ORGANIZATION

Senator SYMINGTON. What is CNA?

Dr. LUKASIK. The Center for Naval Analysis is Navy-sponsored.

Senator SYMINGTON. What is HUMRRO?

Dr. LUKASIK. HUMRRO is Human Research Resources Organization. That is an Army-supported FCRC.

Chairman ELLENDER. That totals two Army-sponsored organizations and one Navy-sponsored?

Dr. LUKASIK. That is right. We will do a small amount of work in organizations primarily supported by the services.

AEROSPACE

Senator SYMINGTON. What is Aerospace?

Dr. LUKASIK. Aerospace is a corporation that the Air Force funded. It is on the west coast. It is concerned with management of strategic services.

Senator SYMINGTON. One of the nonprofit Government agencies?

Dr. LUKASIK. Yes, an FCRC.

MITRE

Senator SYMINGTON. What is MITRE?

Dr. LUKASIK. MITRE is an organization, again Air Force, that does work in the communications field.

LINCOLN LABORATORY

Senator SYMINGTON. What do you do in Lincoln Lab?

Dr. LUKASIK. At Lincoln Lab we have major programs in our high-energy laser area and in the optics area. We have previously supported extensive work in reentry physics although the Air Force and Army have now taken over that support.

Senator SYMINGTON. Most of your work in effect is basic and applied research?

Dr. LUKASIK. That is right.

Senator SYMINGTON. More basic than applied, or vice versa?

Dr. LUKASIK. Vice versa, 80 percent applied to 20 percent basic.

HANDLING RESEARCH THROUGH NATIONAL SCIENCE FOUNDATION

Senator SYMINGTON. There has been apprehension about the close relationship between some of the universities and the Department of Defense. Since 1958 the Director of Research and Engineering in the Department of Defense has been not only a scientist but a nuclear physicist and a former Director of the Livermore Laboratories; right?

Dr. LUKASIK. That is correct.

Senator SYMINGTON. There is a movement on the part of some people to have all basic and applied research handled through the National Science Foundation.

What would you think of that as a way to get a more objective view when these highly technical military questions come before the Congress? In one committee, in effect, the Defense Department says to the scientists, "Come and protect your meal ticket." This but illustrates the very heavy grants that are being given out to the various universities by the Defense Department.

I can see the desirability of doing some of that, but don't think it should impinge on the logic of whether or not we should proceed with a weapons system. In an effort to get around that danger, there has been a suggestion that these research and development contracts should go through the National Science Foundation.

What do you think about that?

Dr. LUKASIK. I grant the difficulty of getting objective judgments on the part of people who are supported by an organization. I think from the standpoint of the Defense Department it would be a very bad move. In the first place, I think one must grant any scientist a degree of objectivity that enables him to separate his science from his advice. He can work in the area of quantum mechanics regardless of his position on the ABM, for example, or his position on test ban treaty. I think as long as one is careful to separate when a person is giving his personal views and when he is simply doing science, one will avoid a large part of the problem. But, of course, there are conflicts of interest in all sorts of businesses. But from the standpoint of the Defense Department it would be a very bad idea to divorce us from the universities.

NATIONAL SECURITY

In the first place, the universities provide a very important input to the Defense Department. The universities are aware of the fundamental work that is going on. Now, if one is concerned with national security, then it is very important that the very best advice and information be provided the Department and that research be done which is required for national security. Now, if one had a mechanism to assure that the National Science Foundation knew about defense problems and defense needs and supported research of the sort that we are supporting, then the suggestion might have some merit.

However, there isn't any such assurance and, therefore, by having the National Science Foundation set their research priorities with no further specification as to how it should be done, our concern is that the research that we think has to be done for national security would not be done. I think from the two standpoints, of getting fresh objective independent views and of using the best minds in the country, to get objective views, to get independent university input into the defense structure is extremely important.

If one is to have any informed public debate, people simply have to know what the defense side of the problem is. They not only provide input to us, but they learn from us and I think to that extent they form a bridge between the Defense Department and the outside community that is a two-way information street and is very important.

Senator SYMINGTON. Having been a member of famous tech-

nological institutions before you came to this work and before that a member of a large corporation, do you feel that you can act with total independence in the present work you are doing; also that the National Science Foundation would operate, you might say, in ignorance of the subject at hand; is that correct?

Dr. LUKASIK. Yes. That is the thing that would concern me.

Senator SYMINGTON. Thank you, Mr. Chairman.

Chairman ELLENDER. Proceed.

TECHNICAL HIGHLIGHTS OF THE ARPA PROGRAM

Dr. LUKASIK. The ARPA program is described in detail in the descriptive summaries which I feel should be an integral part of this statement. Before discussing a few subelements of major significance, I would like to give you an impression of some of the substance of the ARPA program by showing a short film. The film consists of selections from five programs; tests of a small surface effect vehicle in Alaska, the use of laser beams for hard rock excavation, firing of a laser-guided missile from a [deleted] helicopter, a chemical release at high altitude, to simulate a nuclear detonation, and a computer-drawn simulation of an aircraft landing on an aircraft carrier.

(Showing of film.)

MATERIALS SCIENCES

Chairman ELLENDER. The request includes $18 million for a series of projects in the materials sciences category. Comment generally on the nature of your efforts in the field of materials sciences, tell us how ARPA's efforts differ from the specific efforts of the services, and also tell us why you think it is to the advantage of the Government for this particular work to be performed by ARPA rather than one of the services.

Dr. LUKASIK. The research of the Materials Sciences Office is directed to the solution of those material problems that limit the development of advanced systems. These are high-risk, high-return types of programs which if successful would decisively change existing capabilities. Programs of this type are not undertaken by the services because of their overriding responsibility for the support of research on current weapon systems and near-term improvements in these systems.

The services, for example, support work on improved metals and alloys for existing turbines. ARPA is alone in supporting work in ceramic turbines, an area the services have not considered. The services support efforts on improving current night vision devices. ARPA is supporting research which if successful would completely displace these systems. The services now support research on composite materials. ARPA was essentially the sole source of support in this area 5 years ago. As the field develops, ARPA withdraws and transfers the effort to the services. These same initiating and transferring functions have been performed in nondestructive inspection, rare earth alloy magnetic materials and electronic materials.

The advantage to the Government of ARPA sponsorship of these advanced concepts are fivefold. First, it frees the services to concentrate their research and development on current problems specific to

each service. Second, the pacing materials problem can be isolated from current system problems and funds and efforts can be quickly focused to obtain answers before a commitment is made to an entire system. Third, since ARPA has no in-house laboratories but uses universities, industrial contractors, not-for-profits and service laboratories, programs can be initiated, directed, changed and terminated without long-time major commitments of funds, facilities, and manpower. Fourth, the ARPA use of service monitors assures the rapid and orderly transfer of the successful programs to those services who can most benefit from the research. Fifth, ARPA chooses projects that are of multiservice interest and thus prevents duplication of effort that might ensue if each service were assigned the responsibility for advanced high-risk materials research.

Power Systems Materials

Chairman Ellender. The request includes $4.6 million for the project entitled "Power Systems Materials." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The programs of this project element are aimed at finding solutions to those materials problems which limit further advances in power and energy sources. Efforts are concentrated in four areas: high-temperature turbines, superconducting machinery, motors and generators, and batteries. The turbine effort is directed at the solution of the problems of designing engines using temperature resistant brittle materials. If successful, the effort should result in turbines which can operate at temperatures 500°F or more beyond those currently in use with consequent improvement in efficiency and, hence, range, payload, and economy of operation. In the superconducting machinery effort, work is being machinery at cryogenic temperatures (4° K to 20° K). Marked reductions carried and to address the materials problem involved when operating in weight and volume, almost a ten-fold reduction, can be realized if these cryogenic materials problems can be solved and a suitably rugged refrigeration system can be designed. Motors and generators, from fractional horsepower rating to 200 horsepower and above, can be markedly reduced in size and their ratings increased through the use of rare-earth magnetic materials and efforts are continuing in this direction. Work is also underway on the development of new and improved batteries for demanding applications in communications, battlefield sensors, fuses, sonobuoys, and detectors. Long life, high power, reliability combined with small size are the objectives of this program.

Project Objective

Chairman Ellender. Just what is the objective of this project?

Dr. Lukasik. The objective of this project is to make major improvements in those materials which are currently limiting our power generating and power utilization capabilities. All the efforts are aimed at increasing the power density, thus reducing the mass and volume of the power source. In most cases this will result in lower manufacturing costs, relieve pressures on the use of strategic materials, reduce fuel consumption, possibly decrease adverse environmental effects, and enlarge the options available to designers of more durable and reliable military systems.

Chairman Ellender. I note that this effort is concentrated in four areas, namely: high temperature turbines, superconducting machinery, motors and generators, and batteries. How much of the $4.6 million requested is for the support of each of these individual efforts?

Dr. LUKASIK. Of the total, $2.8 million is for the turbine program, $0.8 million is for superconducting machinery, the battery research is $0.2 million, and the motor-generator program accounts for $0.8 million.

Chairman ELLENDER. For fiscal year 1972, $1,946,000 was required for this effort, and as I indicated, your request for fiscal year 1973 is $4.6 million. Just what is the need for this large increase?

Dr. LUKASIK. The turbine program was funded late in fiscal year 1971—June 1971—and hence fiscal year 1972 funds were not needed for that part of the program. The fiscal year 1973 request again picks up the funding for that portion of the program. So you see that the funding is based on essentially a constant level of effort; the increase is more apparent than real, particularly if one examines the expenditures for fiscal years 1971, 1972, and 1973. These are $3.06 million, $3.39 million, and $3.7 million.

Chairman ELLENDER. On page 41 of the justifications, I note the following statement: "All the individual projects in this program element have a lifetime of 3 to 5 years. The brittle material design—ceramic turbine program—is a 5-year effort for the large turbine and a 3-year effort on the smaller unit." Does this mean that, after you work on these projects for the 3 and 5 years, you expect to turn the results of your work over to one of the services for further development if that seems to be desirable?

Dr. LUKASIK. Yes. These turbines should be operating at the end of these stated time periods. If successful, further development and refinement will undoubtedly be carried out by the various services to adapt the new technology to their particular needs. ARPA investigates the potential utility of advanced technology and new scientific areas. When the technical feasibility and military utility are established by ARPA, the military services pursue the exploitation of ARPA results for their specific service applications.

LASER COMPONENT MATERIALS

Chairman ELLENDER. The $18 million requested for materials sciences includes $3,028,000 for the project entitled "Laser component materials." Comment briefly on the objectives of this effort.

Dr. LUKASIK. The objective of this program is the development of new laser materials in order to extend the utility of laser technology in defense applications. For example, present laser rangefinders operating in the near-visible region of the optical spectrum are not widely acceptable to the services since the radiation could damage the eyes of the personnel involved in their use. Our preliminary results indicate that we have a laser operating in the eye-safe region of the optical spectrum—2 microns—which is nearly as efficient as the presently best laser available—the neodymium-in-YAG laser. Our present efforts are directed toward determining how to achieve the greatest possible efficiency.

Other significant problems addressed arise from the fact that solid state and pulsed gas laser beams can damage their own reflecting surfaces, windows, and lasing materials. To avoid such damage, laser systems are constrained to operate below some power levels. We are examining various techniques for treating the surfaces of laser com-

ponents with the hope of achieving a useful increase in the power level at which they can be used without damage or failure.

A third area of concentration is the development of transparent materials for use with the new, high average power infrared gas lasers. Materials which are available to us at the present time absorb so much power that they warp into an optical "lens" and defocus the beam. We are attempting to understand the reasons why some of these materials absorb this radiation since they should be more transparent than we have found them to be. We are also starting experimental studies to determine how best to make them in the large sizes that are needed for laser weapon systems.

Chairman ELLENDER. What are your specific objectives for the planned 1973 program?

Dr. LUKASIK. Our specific objectives for this 1973 program are: first, to determine the optical, thermal, and mechanical properties as well as the technique for growing of a new nonlinear optical material, thallium-arsenic-selenide, which may be useful in missile countermeasure applications and in shifting the wavelength of CO lasers to achieve more favorable atmospheric propagation; second, we are attempting to grow new laser materials which will generate higher peak powers than existing materials; third, we are searching for reproducible methods for increasing by fivefold the power level at which solid state lasers can operate without damage to the surfaces of the components of the system; fourth, we are trying to determine if the absorption in infrared transmitting glass can be reduced to 0.05 percent per centimeter of thickness to avoid defocusing of the high power infrared laser beam; and finally, we want to determine how best to produce polycrystalline alkali halide windows from relatively pure single crystals of the same materials in order to produce large, strong, and nonabsorbing windows for use with high power infrared lasers.

Chairman ELLENDER. Could you comment on the efforts of the three services in the field of laser component materials, and tell us how your effort does not duplicate the efforts of the services?

Dr. LUKASIK. The areas in which ARPA concentrates its efforts are in laser induced damage to laser components, new optically pumped laser materials permitting operation in wavelength ranges where photoelectric detectors are more sensitive or where the eye safety problem is greatly reduced, and in windows for high power infrared lasers. The services have no programs in the first two of these areas. In the latter area, the Air Force's program reflects the needs of an interim application whereas ARPA's are meant to have larger impact in the 3-to-5-year span. Further, the Army has programs in semiconductor lasers and materials for rapidly switching on lasers, both of which are in support of their interests to develop lightweight ranging laser systems. ARPA has no programs in these areas. Service personnel do, however, serve as the contract monitors for ARPA's laser component research programs and are, therefore, aware of them. This is of great help in transferring the results of the successful ARPA work to the services.

Chairman ELLENDER. The $3,028,000 requested for 1973 is an increase of nearly $1 million over the sum provided for 1972. Just what is the need for this increase?

Dr. LUKASIK. The new high power infrared gas lasers have several applications with great potential for the Department of Defense. These applications depend critically upon the continued development of suitable window materials. There are window materials that can be used in current systems, but for the more advanced systems new and considerably improved materials must be found. The increase in funding is to insure that such materials will be available.

STRUCTURAL MATERIALS

Chairman ELLENDER. The $18 million requested for materials sciences includes $1,555,000 for the project entitled "Structural materials." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The programs in this sub-project are concerned with research and development in areas which will produce new, improved, or modified materials with superior or unique mechanical, chemical, or physical properties. Programs are supported in composites, explosive forming and welding, and plasma and vapor deposition of alloys and compounds. Other studies are concerned with glassy carbon, a new and potentially useful temperature-resistant material. In polymers only studies which show unique and potentially useful developments are supported; items such as gradient polymers, (those that have varying properties through their thickness) for specialized applications such as aircraft fuel tanks; inorganic polymers that can chemically incorporate heavy metal ions for use in re-entry vehicles, polymers which show reversible thermo-electric and stress-electric responses for use as improved underwater sound detectors; polymers incorporating metal atoms to make them into insulating ferromagnetic films for use in magnetic control systems. Other efforts are concerned with fracture and failure analysis for engineering materials.

PROGRAM OBJECTIVES

Chairman ELLENDER. Give us a brief description of your objectives in this effort.

Dr. LUKASIK. Our objectives in this project are focused on the development of new materials such as those indicated above which show unique and potentially useful properties for military applications. In most cases not only is the material itself investigated but also the process needed to produce it since this is often the key to successful application of some of these new and unusual materials.

Chairman ELLENDER. Please comment on the related activities of the services in this field, and tell us why ARPA's efforts do not duplicate the efforts of the services.

Dr. LUKASIK. There is no duplication of effort in this area between ARPA and the services. Before starting any activity in this field the services are canvassed to determine whether they are supporting any related efforts. If they are, then ARPA does not initiate a program in that area. The services do support very extensive research and development programs in structural materials but these are all on conventional materials such as metals, alloys, plastics, coatings, adhesives, weldments, et cetera. These studies are generally in support of specific system requirements and are focused on much more current material problems than an ARPA program.

Typical studies being supported only by ARPA are: glassy carbon, inorganic polymers, ferromagnetic polymers, gradient polymers, and brittle material failure mechanisms.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973.

Dr. LUKASIK. For fiscal year 1973 our research on a new form of carbon which is neither crystalline nor amorphous will be continued. It is a high-temperature high-strength corrosion-resistant material that can be controllably produced to yield a wide range of physical, chemical, electrical, and mechanical properties.

Studies on unusual polymers will be continued. These include inorganic polymers, metalloorganic materials, and polymers having graded physical properties.

Efforts are continuing on the studies of the basic failure mechanisms in structural materials with particular emphasis being placed on the behavior of brittle materials such as ceramics.

Chairman ELLENDER. I note for fiscal 1971, $2,786,000 was provided, for fiscal year 1972, $1,976,000 was provided, and as I indicated, you are requesting $1,555,000 for fiscal year 1973. Does this decrease in funds indicate that this project is coming to a close?

Dr. LUKASIK. The decrease in funding noted is due to the completion of our efforts on composite materials, and on explosive forming and explosive welding. Efforts on producing thin-film materials by plasma sputtering are also being phased out by transferring this technology to the services. However, because of continuing needs of the Department of Defense for new and improved materials, this program element will continue to be an important segment of the materials sciences research.

DETECTOR AND INFORMATION PROCESSING MATERIALS

Chairman ELLENDER. The $18 million requested for materials sciences includes $4,757,000 for the project entitled "Detector and information processing materials." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Efforts within this project are concentrated in five areas: the first is materials for detection of radiation ranging from the ultraviolet wavelengths to acoustic waves. Second is materials for information processing which includes magnetic bubble materials for use in computer memories which do not loose their stored information if power failure occurs, luminescent materials for use in cathode ray tubes and other forms of displays, materials for surface and bulk acoustic wave devices which are useful in delay lines and correlators, and materials for integrated optical circuits. This latter technology combines the techniques developed for integrated circuits to make structures in which minute optical beams can propagate and be modulated. It promises to be extremely important because of its complete insensitivity to electromagnetic pulses and electromagnetic interference. Third is materials and processes for making transistors and integrated circuits as well as studies of fundamental processes affecting their reliability. Fourth is the area of amorphous semiconductors. Devices made from these are generally insensitive to the effects of nuclear radiation. The last area includes new semiconductors for applications not in the area mentioned above. Examples of the latter are electron emitting surfaces that do not require heating to high temperatures, and microwave power sources.

In fiscal year 1973, efforts on magnetic bubble materials, and fundamental processes related to failure in integrated circuits will be continued. Investigations of thick film microcircuits, gallium arsenide, amorphous semiconductors, and semiconductors made with rare earth compounds will receive reduced levels of support in FY 73. A new, concentrated program of research will begin on materials and mechanisms for constructing photocathodes which are sensitive to infrared radiation in the 1.1–2 micron range. Present photocathodes do not respond to radiation in this wavelength range. Development of such photocathodes will greatly enhance night vision capabilities since 100 times more light is present in this range than in the visible and nearer infrared as a result of

re-radiation from atmospheric molecules; these photocathodes will also permit image intensifiers to be used with eyesafe lasers. Major support is also planned for a second new area: integrated optical circuits. This technology is seen to be of exceptional importance since it could provide a way to communicate and transmit information which would be almost completely free from electromagnetic interference effects. Materials research efforts will be supported which will lead to improved fibers (the medium through which the optical signals will propagate), techniques for coupling light into and out of fibers, and materials and techniques for modulators, beam deflectors, light sources, and non-fibrous passive propagation channels.

PROGRAM OBJECTIVES

Chairman ELLENDER. Comment briefly on the objectives of this effort.

Dr. LUKASIK. The major objective of this program is to develop new and improved semiconductor and optical materials and the processes for making them in order to bring about substantial increases in sensitivity, speed of response, and wavelength of operation of radiation detectors, as well as new capabilities in information processing materials and devices. By way of example, a major program is directed toward the development of new materials and techniques for making photocathodes which will permit us to see far better at night than present materials permit. A second objective is to develop the materials and devices for integrated optical circuits which, we believe, will lead to command, control, and communications systems on board ships and aircraft which will be much more immune to electromagnetic interference effects than are present copper wire and cable systems.

Chairman ELLENDER. I note that the services have considerable efforts in this field. Tell us why ARPA's efforts in the field of detector and information processing materials do not duplicate the efforts of the services.

Dr. LUKASIK. The major areas which ARPA supports in detector and information processing materials are photocathodes which are sensitive to infrared radiation in the 1.1–2 micron range, techniques for preparing magnetic bubble materials which may be useful as a computer memory, materials for integrated optical circuits for optical information processing, amorphous semiconductors, and fundamental processes affecting integrated circuit reliability. Since the services do not directly support materials research programs in these areas there is no duplication. However, service personnel are active in these programs since they serve as our contract agents and monitors. This mechanism not only speeds the transfer of the program to them if it is successful but also through this relationship they have a legal responsibility to see that there is no duplication with any of their own service-funded efforts.

Chairman ELLENDER. Comment briefly on the objectives of your planned program for fiscal year 1973.

Dr. LUKASIK. With respect to the development of new infrared photocathodes, our objective for fiscal year 1973 is to evaluate several possible photocathode design techniques which could lead to efficient emission of electrons upon absorption of radiation in the 1.1–2 micron range.

In integrated optics, our specific objectives in fiscal year 1973 will be to begin the evaluation of several materials preparation techniques for making the low-loss waveguide structures used as passive links

connnecting light sources, modulators, and other discrete components in an integrated optical circuit; we also plan to explore various ways to couple these components. Additionally, since we feel that it will be important to have integrated optical circuits which can operate in the wavelength regions of high power infrared lasers for processing of [deleted] and other data, we will initiate efforts to develop infrared transmitting fibers.

In the area of integrated circuit reliability, a major problem in current DOD electronic systems, our specific objectives for fiscal year 1973 are to determine the influence of silicon processing-induced defects on yield and reliability, to continue an effort to understand why insulators in integrated circuits fail, and to understand the reliability aspects of glass protective layers applied to the surfaces of integrated circuits.

Chairman ELLENDER. Just what is the need for the increase of $874,000 you are requesting?

Dr. LUKASIK. The increase we are requesting in this program will be used to expand into the two new major efforts I mentioned previously: integrated optical circuits and infrared photocathodes. We are at the same time reducing our program in amorphous semiconductors.

Regarding integrated optical circuits, we see this new technology as having the potential to lead to a major breakthrough in reducing the susceptibility of DOD electronic systems to intense electromagnetic pulses (EMP). You may recall that Mr. Laird, in his testimony earlier this year, mentioned the importance of solving this problem. [Deleted.]

Some of the increase which is requested will also be used to develop the new infrared photocathodes. To make the potential gain here more obvious, the clear night sky radiates approximately 100 times more energy in the 1.1–2 micron range than it does from the visible region to 1.1 micron where present photocathodes become insensitive. Thus, if equally sensitive detectors can be constructed, our night vision capabilities could be increased manifold by making use of this radiation.

OTHER MATERIALS STUDIES

Chairman ELLENDER. The $18 million requested for materials sciences includes $660,000 for the project entitled "Other Materials Studies." Please comment on this request.

Dr. LUKASIK. As you have seen, the principal focus of our materials work is in power system materials, laser component materials, structural materials, and detector and information processing materials. Each of these segments is made up of several subelement programs. Prior to the inclusion of some of these subelements into these main programs they are funded under this category until the concepts are shown to be worth pursuing. Typical examples of this are the original funding of rare earth magnets in this category. As they were shown to be of value their support was moved to power system materials. On the other hand, rare earth ferroelectrics did not show promise as detectors and work on them is being terminated.

This program element also shows funding for various advisory groups and intergovernmental coordinating agencies. The National Materials Advisory Board, for example, is funded jointly by ARPA and the services as is the Federal Interagency Council on Materials.

INTERDISCIPLINARY LABORATORY PROGRAM

Chairman ELLENDER. The total of $18 million requested for materials sciences includes $3,400,000 for the continuation of the support of the interdisciplinary laboratory program. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

DESCRIPTION

This is a long-range program in basic research which has been supported by ARPA since 1961 and is now being transferred to the National Science Foundation where it will become part of an expanded effort to be known as the Materials Research Division of that organization. The purpose of the program was to bring together physicists, chemists, engineers, ceramists, and metallurgists in a university environment and to focus their efforts onto the study of materials; particular those areas of materials that needed an infusion of new basic science.

FISCAL YEAR 1973 PROGRAM

As part of the transfer agreement between the Department of Defense and the National Science Foundation, ARPA will supply $4.6 M of FY 72 funds to the Foundation as a settlement for Building Use Charges. These are funds due to the universities as a result of the construction of facilities during ARPA sponsorship. The Foundation will in turn assume responsibility for their total funding for FY 73 insuring that those programs of primary interest to the Defense Department will be maintained during FY 73. The following year ARPA will continue to fund on a project-by-project basis those programs that are of interest to the Defense Department.

Chairman ELLENDER. Is this $3.4 million to be transferred to the National Science Foundation which now has the responsibility for the support of these laboratories?

Dr. LUKASIK. No; this $3.4 million will not be transferred to the National Science Foundation. This is research to be funded directly by the Department of Defense on a project-by-project basis at the various interdisciplinary laboratories. While NSF is providing the basic support for these laboratories, ARPA is funding specific defense-relevant projects. The extent of this support for fiscal year 1973 is part of the agreement between DOD and NSF in order to effect a smooth transfer of responsibility between the two agencies.

Chairman ELLENDER. Will this $3.4 million you are requesting for fiscal year 1973 complete ARPA's support of these laboratories?

Dr. LUKASIK. Yes. This $3.4 million support in fiscal year 1973 will complete the terms of the formal interagency memorandum of understanding on joint funding during fiscal year 1972 and fiscal year 1973 period by ARPA and NSF.

BUILDING USE CHARGES

Chairman ELLENDER. On page 52 of the descriptive summary, in connection with the program for fiscal year 1972, I note the following statement:

The work in progress at these laboratories will be continued under ARPA sponsorship to July 1972 when the National Science Foundation will assume the primary responsibility for their base support. NSF will operate this program in the same fashion as that used by the Department of Defense. As part of the transfer agreement between DoD and NSF, ARPA will supply $4.6 million in FY 1972 funds to the National Science Foundation as a settlement for building use charges. These are funds due to the universities for construction of facilities during ARPA sponsorship.

Just what is involved in this payment of $4.6 million for building use charges?

Dr. LUKASIK. This $4.6 million is the final amount due the universities based on a contractual obligation of the Department of Defense incurred when the program was initiated in the early 1960's to pay for the expansion of the facilities of the interdisciplinary laboratories. The Department of Defense has been paying this obligation in yearly increments. With the transfer of the responsibility for the operation of these laboratories to the National Science Foundation the Defense Department transferred the funds to NSF to complete this contractual obligation.

Chairman ELLENDER. As I understand it, while the National Science Foundation will have the primary responsibility for the support of these laboratories, you expect to continue to do work with these laboratories on a project by project basis. Am I correct about this?

Dr. LUKASIK. Yes. Work of direct defense-relevance will be continued at these various laboratories on a project-by-project basis. Since we have created and supported these facilities over a period of years, we are aware of their excellent capabilities. They are a valuable resource to the Department of Defense and we will continue to utilize these capabilities.

Chairman ELLENDER. Why couldn't the requirements of ARPA be performed with the funds made available to these laboratories by the National Science Foundation?

Dr. LUKASIK. Some of those ARPA requirements which relate to the support of basic materials science such as the systematic collection of data, the development of new theories, the modeling of ideal systems, etc., will be met by the support given these laboratories by the National Science Foundation. ARPA, however, has additional specific defense needs which require the integration of the basic studies with the work of other contractors to effect the rapid and smooth transfer of basic science to its military application.

HUMAN RESOURCES RESEARCH

Chairman ELLENDER. The next item is a request of $7.6 million for a series of projects under the human resources research category. Comment generally on the nature of this work.

Dr. LUKASIK. The human resources research program is concerned with improving the overall effectiveness and efficiency of the defense manpower force in the many functions it performs and, by that avenue, with improving the overall mission effectiveness of DOD. As you are well aware, the effectiveness of our Armed Forces does not rest on advanced weapons systems alone. The performance of defense personnel in combat, in support roles, in assessing intelligence data, and in strategic planning and forecasting tasks, to name but a few, are all critically important components of our defense capability. In our human resources program, research is undertaken to find better ways of meeting these essential defense requirements. At the present time, the major areas of emphasis in this program are concerned with devising ways to improve the performance of people under severe stress, enhancing the accuracy of long-range planning functions, the development of improved techniques for extracting warnings and significant trends from intelligence data, development of more effective training systems for DOD application, and research on advanced methods for planning and managing the defense personnel force under conditions of volunteer service.

Chairman ELLENDER. How do your efforts in this field differ from the efforts of the services with respect to human resources research?

Dr. LUKASIK. The ARPA human resources research effort differs from service programs on two principal dimensions—the major one being that ARPA (6.1) programs in this area address problems which are of DOD-wide concern and which are not the sole responsibility of a single service. The service laboratories quite appropriately address those problems which are unique to their parent service. If the existing service program were the only source of support in this research area, many major problems which transcend all services would be inadequately addressed. There is a need for an agency of DOD to support research on these broad problems. The ARPA human resources program serves that function on a 6.1 level. Our aim is to provide scientific bases for technological innovations which services can use to address operational problems.

The second significant dimension is the time frame from research to application. ARPA is specifically chartered to undertake long-range programs in areas of technology where successes would constitute major contributions to national security. In contrast, the service laboratories, substantially driven by the operational pressures of their parent service, tend to focus the bulk of their resources on research activities of near-term payoff. While that strategy works well in the short term, it serves to reduce the level of research attention to longer range goals and to the development of a strong technology base for future exploitation. The ARPA human resources program is specifically formulated to meet long-range goals and to develop on a broad base areas of relevant technology from which the service R. & D. programs can draw in the future. ARPA research activities concerned with the application of biofeedback to improving performance under stress, as well as research on advanced gaming and simulating techniques and research in the area of biocybernetics are examples of ARPA human resources programs differentiated from service activities by the time frame DOD-wide utility dimensions.

While the factors just mentioned would serve in their own right to differentiate the ARPA human resources program from service programs, further active steps are taken to insure that efforts are not duplicated and that ARPA programs are directed toward legitimate long-range needs. For example, close liaison is maintained with the cognizant office for human resources in O.D.D.R. & E. At that level, summary information on all research programs in the human resources area is frequently reviewed by ARPA representatives. In addition, active contact is maintained with all service laboratories pursuing research in the human resources area. Other coordinating mechanisms employed include triservice advisory panels on major programs, triservice/ARPA conferences and the use of service personnel knowledgeable and active in the human resources research areas as technical monitors of ARPA-supported work.

ANALYSIS AND MODELING OF COMPLEX SYSTEMS

Chairman ELLENDER. The total requested for Human Resources Research includes $1,675,000 for the project entitled "Analysis and Modeling of Complex Systems." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objective of this project is to develop an advanced, computer-based analytical capability for application to Defense problems requiring for their solution the simultaneous management and control of a large number of behavioral factors as well as the manipulation of extremely large masses of data. In addition to analytical methods, the project focuses on the development of a computer facility and associated programming techniques which will permit the sharing of data and methods among a community of scientists and Defense personnel who need not be computer experts to use the system effectively. Examples of Defense Department applications for which this advanced capability will be useful include: (a) the management and rapid analysis of masses of intelligence data to discern trends and significant events; (b) simulation and experimental assessment of the operational dynamics of large command and control systems; (c) comprehensive analysis of the diverse factors which bear on the effective operation and management of DoD personnel force; (d) quantitative assessment of the numerous factors bearing on strategic defense postures to enhance the capability to forecast and prepare for possible armed conflict.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment briefly on the objective of this effort.

Dr. LUKASIK. The scientific community most expert in the human resources area has lagged far behind other scientific disciplines in applying the power of digital computers to its research activities. This deficiency has been a particular hindrance since problems in this research area are usually of such a size and complexity as to require sophisticated computer applications if problems are to be attacked efficiently and on a meaningful scale. This research program is specifically concerned with closing that gap by advancing the development of computer-based analytic techniques specifically tailored to the kinds of problems of concern in the human resources research area.

Chairman ELLENDER. Is this total request of $1,675,000 for work to be performed by the Massachusetts Institute of Technology, which has a sub-contract with Harvard University?

Dr. LUKASIK. Yes. This is a collaborative effort involving scientists from both Harvard and MIT. The scientific expertise at those two institutions offers a unique combination of the appropriate skills and knowledge in the behavorial sciences as well as relevant skills in computing technology.

Chairman ELLENDER. I note that this program was initiated in fiscal year 1969. When do you expect to complete this effort?

Dr. LUKASIK. The basic research program will be completed, as originally planned, with the fiscal year 1973 funding increment.

STRATEGIC GAMING AND SIMULATION

Chairman ELLENDER. The total requested for Human Resources Research includes $930,000 for a project entitled "Strategic Gaming and Simulation." What is the broad objective of this project, and exactly what do you plan to do with the $930,000 requested for fiscal year 1973?

Dr. LUKASIK. The broad objective of this project is the development and experimental use of a versatile computer-based simulation facility to support a program of research directed toward significantly improving the effectiveness of DOD personnel in high level negotiation functions. Many vital DOD positions require military officers to make decisions in situations where bargaining and negotiation are required. We are supporting development of a center for research and simulation of computer-based military bargaining. The center is designed

around a time-shared computer system that will make its informational and technological resources available to military analysts and behavioral scientists located at widely dispersed university and research centers, offering them new and powerful research and educational tools.

While bargaining and crisis resolution are not reducible to a simple set of rules, the likelihood of successful job performance where bargaining is called for can be increased by relevant training. Before we institute appropriate training programs we need to know what specific and general skills are important for officers to learn and how that learning can be accomplished efficiently. After officers are assigned we need to provide them with tools to assist them in formulating optimum bargaining strategy and predicting their results. However, before we can provide such guidance, we must know how to identify important features of specific bargaining situations. We must also demonstrate how differences in these situations alter the nature of bargaining potentials and dangers.

The requested funding will support completion of the laboratory facility and the basic set of computer software essential to its operation. Research using the facility will be initiated to extend the usefulness of group judgment techniques (DELPHI) as a means of improving the quality of decisions taken in bargaining and negotiation contexts. Experiments will be conducted also on the influence of differences in risk-taking behavior on decisionmaking in high level negotiation and war gaming exercises.

In addition, software developments will be pursued to increase the capability to process and analyze printed text, and to provide a computer-based aid which will permit participants in a simulation exercise, or its operational counterpart, to rapidly discern trends and relationships in the data sets bearing on the relevant issues.

Application and Utilization

Chairman Ellender. The total requested for human resources research includes $950,000 for the project entitled "Application and Utilization." Please comment on the broad objectives of this project.

Dr. Lukasik. The broad objectives of this program are to bring basic science results and capabilities developed under the human resources program into operationally useful form. As you know, discoveries in basic science rarely emerge from the laboratory in directly usable form. It is most often the case that a newly discovered phenomenon, a new technique or procedure deriving from basic science must be modified, combined with other knowledge and generally shaped for operational application. It is that function, rather than a discipline or subject matter focus, that define this program area. At the present time, the major transfer activities being pursued within this program are concerned with the development of quantitative forecasting techniques, development of aids for intelligence data analysts, and the assessment of a computer-based aid to foreign language training. All of these activities build upon earlier basic research results from the ARPA-supported human resources program and all are moving to meet important operational needs.

Chairman Ellender. Exactly what do you plan to do with the $950,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. Approximately $500,000 will be used to develop quantitative strategic forecasting techniques for use by DOD intelligence analysts and long-range strategic planners. This research effort builds upon earlier ARPA-supported basic research in the area of quantitative political science. Approximately $300,000 will be committed to further development and operational application of specific basic research products derived from the strategic gaming and simulation project and from the program area identified as the analysis and modeling of complex systems, both of which I have just elaborated on to the committee. Developments from these basic research projects which will be translated to operational application in the intelligence community include automated methods for identifying common themes—content—in printed text and a computer-based technique which will permit a system planner to rapidly verify the performance characteristics of a proposed information processing system before expensive commitments are made to prototype buys. Both of these capabilities are being developed at the request of, and in technical collaboration with the Rome Air Development Center to assist that agency in the development of improved systems for extracting indicators and warnings from large intelligence data bases. The remainder of the requested $950,000—$150,000—will support field testing of a computer-graphics systems designed to accelerate the learning of foreign languages. The field tests to be supported in fiscal year 1973 will assess the utility of the device in acquiring spoken skills in Mandarin Chinese and Spanish.

HUMAN PERFORMANCE

Chairman ELLENDER. The request of $7.6 million for human resources research includes $2,145,000 for the project entitled "Human Performance." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objective of this program is to improve the effectiveness of Armed Forces personnel in accomplishing their mission responsibilities under the full range of conditions which bear on military operations. Major areas of effort include: (a) research directed toward developing techniques to permit an individual to bring internal physiological reactions under voluntary control—thereby increasing tolerance to combat stresses and environmental extremes; (b) experimental investigations of the potential for using neural signals as a means of direct interaction with computers; (c) a search for more efficient ways to display information to humans so that effective control can be maintained over increasingly complex, high performance weapon systems; (d) research to improve the selection and training of high quality military leaders; and (e) a series of investigations designed to develop a better means for reaching accurate judgments and decisions from equivocal and uncertain information (as in deriving intelligence estimates).

PROGRAM OBJECTIVE

Chairman ELLENDER. Just what are the objectives of this effort?

Dr. LUKASIK. Going beyond the objectives already provided in the descriptive summary, I would like to emphasize that the bulk of the funds in this program areas are devoted to research to find ways of increasing the ability of the individual soldier, sailor, airman, or decisionmaker, be he civilian or miltary, to be better able to function at maximum efficiency under stress—under the stress of combat, or the stress of overwork, the stress of sleep loss, environmental stresses, or the stress of making vital decisions in the face of uncertainty. In one

sense, the maintenance of individual performance capabilities and unit cohesiveness in the face of severe adversity is the ultimate test of Armed Forces and of the decisionmakers who commit them to action. How well men perform in these situations, in large part, determines the outcome of military actions.

Although the major thrust of this research program is concerned with extending performance under stress, it is not limited solely to that. As you will note in the descriptive material provided, this program also seeks to improve individual performance capabilities on a broad front, ranging from research to improve the training and selection of high quality military leaders to research concerned with augmenting human performance through closer coupling of men and computers.

Chairman ELLENDER. Tell us why you feel that ARPA's efforts in this field do not duplicate the efforts of the three services in the field of human performance.

Dr. LUKASIK. ARPA's work on development of control of internal physiology for performance enhancement is relevant to the needs of all three Services; presently it is not being undertaken by any. Results are expected to support the Army's planned Extended Performance program—that is, extended around-the-clock combat operations—and should significantly enhance performance of personnel on watch and surveillance duties in terms of increased vigilance and attention. Decisionmaking, of course, is basic to the activities of all of the services, and this ARPA program is alined with the expressed needs of the Army, Navy, and Air Force with regard to improved individual information handling capabilities for this purpose. Service laboratories are kept aware of progress, and an orderly transition of all basic research results through developmental stages toward operational utilization is planned.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973.

Dr. LUKASIK. ARPA researchers have discovered that control of heart rate can improve problem solving ability, and that self-regulation of brain waves can partially alleviate the performance decrement caused by sleep loss. In fiscal year 1973 these and related phenomena will be further explored and tested in operationally relevant situations. A basic research program designed to achieve ways to more closely couple men to computers will be expanded—the principal thrust at this early stage being detailed study and analysis of electrical activity of the brain to see if meaningful command signals, or signals indicating the attentive state of the organism can be derived from that source. Breakthroughs in both of these areas will be of enormous potential to augmenting human performance capabilities. As indicated in the descriptive material furnished the committee, other components of this research program concerned with the effects of task overload and sleep loss on performance, a small effort on selection and training of military officers, and research on the use of tactile displays to convey information to pilots or operators of other military equipment will continue in fiscal year 1973.

TRAINING AND MANPOWER EFFECTIVENESS

Chairman ELLENDER. The request of $7.6 million for human resources research includes $1.9 million for the project entitled "Train-

ing and manpower effectiveness." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Knowledge of the complex dynamics of the Defense manpower system is crucial to more realistic planning in the face of manpower cuts, and development of a new generation of advanced training technology is required for more efficient use of available human resources. This program will develop quantitative methods to forecast supply of volunteer recruits (including cost effectiveness of lateral entry); analyze implications of alternate DoD training system strategies; survey options and potential gain from large-scale DoD usage of computer-aided instructional systems; improve and exploit techniques for programming of lesson material by naive users, establish a tri-Service center to serve as test bed for comparison of a wide variety of system options. General objectives are: development of advanced training technology for application in the diverse and costly ($6.5 billion annually) training programs conducted by DoD and development of the information base with appropriate quantitative tools necessary for cost effective manpower policy and management decisions.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment briefly on the objective of this effort.

Dr. LUKASIK. This research program has as its central purpose the reduction of the manpower cost burden in DOD. As you know, manpower costs already exceed 50 percent of the DOD budget and are projected to take an even larger percentage of the budget as we move to an all Volunteer Force. This research program is designed to develop the information and technology base to help get manpower costs in hand, and we plan to pursue two broad areas of inquiry to meet that goal.

As noted in the descriptive materials furnished the committee, one area of research emphasis is concerned with the development of highly efficient training systems for DOD application. There is reason to believe that modern technology applied to training can produce substantial reductions in training costs. In full cooperation with the services, we plan to accelerate the development and trial of such cost effective training systems in DOD.

The second area of emphasis in this research program is concerned with the development of advanced methods and new information to assist policymakers in determining the most economical means of maintaining needed force levels. At the present time, the true dynamics of the overall manpower system are not understood; models (simulations) used to forecast personnel accessions, flowthrough and separations are deficient, we lack adequate indicators of manpowers productivity in defense contexts, and we do not have adequate methods for equating military jobs to work in the civil sector and hence have difficulty in deriving pay scales based on objective comparability. These are but a few of the methodological shortfalls that we intend to address and solve in this research program. As is evident, the savings to be realized from even small gains in either training or personnel system effectiveness can be enormous. I expect high payoff from this program.

Chairman ELLENDER. How are your efforts in this field coordinated with those of the services, and tell us why these are not duplicative efforts.

Dr. LUKASIK. In the case of manpower research, the program content is developed in close liaison with the Office of the Assistant Secre-

tary of Defense for Manpower and Reserve Affairs. Through that office, in turn, liaison has been established with each service agency concerned with manpower research. This active coordination serves to prevent duplicate efforts. Furthermore, it is important to note that the ARPA manpower research program is addressed to DOD-wide problems of concern to OSD level manpower planners, while the service programs deal with the specific problems of their parent service.

Our program of research on training technology is conducted as a collaborative effort with active service participation in the planning and conduct of the overall program. Under this arrangement, ARPA funds are made available to the services on a matching basis for support of projects planned and agreed to by all services and ARPA. Inasmuch as we are coparticipants with the services in this research plan, the question of duplication of effort does not arise.

Chairman ELLENDER. Just what do you plan to do with the $1.9 million you are requesting for fiscal year 1973?

Dr. LUKASIK. Of the $1.9 million requested for fiscal year 1973, $600,000 will be committed in support of manpower research; the balance of $1.3 million will support research and development activities in the training technology area. Specific tasks to be undertaken in the manpower research program include an effort to determine the relative impact on recruitment and retention of various monetary and nonmonetary incentive offered by DOD. The research will focus specifically on the development of a quantitative index of the relative values assigned by DOD personnel to incentives, and to a determination of how these relative values shift in the course of career or age progression. Other research projects seek to develop indices of productivity for DOD personnel. In the absence of such indices, we are forced to deal with broad manpower issues simply in terms of numbers of people without reference to quality. This is a serious void that needs to be addressed. Research will also be concerned with the impact of altered physical standards on the supply of volunteer recruits, the analysis and improvement of retention and accession models, and an analysis of the impact of training at various career points on personnel retention.

In our research effort concerned with training technology we plan to commit about $560,000 in fiscal year 1973 to a DOD experimental evaluation of the PLATO IV computer-aided-instruction system (CAI). As presently planned, a 25-terminal facility will be installed at Chanute Air Force Base, Ill.; an additional 20 terminals will be emplaced at the Navy Personnel and Training Research Laboratory, San Diego, and the 20 remaining terminals are planned to be assigned to the Army for experimental use at a site not yet determined. The experimental programs will serve a number of important functions. It will provide both R. & D. and operational training personnel of all the services with a direct hand on familiarity with the most advanced CAI system in existence. In addition, special tests will be run to assess the relative effectiveness of the system as a training device for a representative array of military technical training courses. Detailed comparisons will be made of the cost of instruction by this CAI system as opposed to conventional teaching methods.

In addition to the PLATO IV test, we plan to fund the continued development of a small training system which could operate independently of a large central computer, which would rely on a very inexpensive microfiche system to present the instructional material and which

could be packaged in portable form and perhaps used as an on-line maintenance aid in addition to its primary training function. Such a system might find wide application for shipboard use or for training at remote sites.

In addition to the hardware-related activities I have just mentioned, we will also be cooperating with the services in funding research on problems of performance tests using CAI systems, assessing the motivational implications of altered forms of curriculum presentation and a program of research on the very broad question of the effectiveness of tailoring instruction to individual learner attributes.

Information Processing Techniques

Chairman Ellender. The next request is $15.1 million for a series of projects in the category of "Information Processing Techniques." How much was made available for the projects in this category for fiscal years 1971 and 1972?

Dr. Lukasik. The total IPT commitments for fiscal year 1971 and fiscal year 1972 were $16.2 million and $15.6 million, respectively. These figures are broken down by subprojects as set out in this tabulation which I will provide for the record.

(The information follows:)

[In thousands of dollars]

	Fiscal years—	
	1971	1972
Automatic programing	522	2,455
Picture processing	1,590	2,252
Intelligent systems	5,254	6,016
Speech understanding	790	3,537
Completed projects	8,044	1,340
Total	16,200	15,600

Chairman Ellender. The request includes $3,660,000 for a project entitled "Automatic programing." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The goal is to develop computer techniques which will permit the computer itself to write and debug programs given only a specification of the problem and results desired. Currently, to produce a new program the problem specifications must be given to a programmer who then constructs the squence of operations which the computer must follow. This operation is complex and many errors are made, resulting in time-consuming debugging. Computer technology has now progressed to the point where it appears feasible to have the computer itself undertake the programming tasks of constructing the detailed sequence of operations, optimizing this choice, and debugging the result. This is an extremely difficult task but one with a very large payoff since DoD spends over $450 million a year on computer programs, 90% of which is for programming, coding, keypunching and program checkout.

Program Objective

Chairman Ellender. Comment briefly on the broad objectives of this program.

Dr. Lukasik. To stem the rapidly growing costs of computer software production it is necessary to make a major change in the programing process. Small advances have been made through better lan-

guages and program modularity but the requirements for many large complex procedures to be automated through the development of computer software are increasing faster than current technology permits due to the limited supply of programers and dollars. Automatic programing is the general description given to the class of computer techniques which would automate this central task, that of producing the detailed computer commands required to implement any process on a computer. The task of describing the job to be done would still be a human function and even after the man with the problem (a noncomputer specialist) has described the desired input, output and data transformations, the automatic programing system may still need questions to be answered on particular clarifications. But, the major job of finding the optimal procedures, choosing internal computer data forms, and putting together the detailed program would be automated.

Chairman ELLENDER. Are the services doing any work on this problem?

Dr. LUKASIK. ARPA's program is the only direct attack on this problem underway. It is absolutely required that the computer aid programers in all phases of the programing cycle, including design, modification, integration into larger systems, optimization, and testing. Standardization of software and hardware is being pushed within DOD. While this is helpful with the reprograming problem, it does not affect the basic issue of how very large and reliable software systems can be built in the first place.

Chairman ELLENDER. When was this project initiated, and when do you expect it to be completed?

Dr. LUKASIK. Portions of this project were first initiated as part of other efforts in intelligent systems and man-machine systems during the last 3 years. The goals of this project were formulated during fiscal year 1972; individual research efforts in this project will be from 3 to 5 years' duration. It is expected that this research will be phased out by fiscal year 1978. Transfer of this new technology to the services will be greatly aided by the fact that the tools and techniques to be developed will be available on systems of the ARPA network and therefore will be immediately accessible by the services.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973.

Dr. LUKASIK. A central part of an automatic programing system is an extensive data base which contains facts and relationships relevant to each class of program as well as techniques for writing programs in that class. A normal subroutine library forms only the smallest component of such a data base. Experimental development of an adequate data base is underway. The two problems receiving major attention are what should be in the internal structure of the information, and how to design interactive programs which allow expert programers to "teach" the system by adding information. Experimental programs which use both the data base and the specifications provided by a user to write the required program are also underway.

During fiscal year 1973, development of the data base will continue with emphasis on its internal structure, which is critical because improper organization of the vast quantity of information will make the system too unwieldy to work. Advanced techniques will be developed for constructing programs when given all of the relevant facts. Two

issues related to the modification of programs will be explored: The reprograming problem, where an existing program needs to be rewritten for a different computer; and the problem of modifying a program to provide more or different output. In both cases, it is now often necessary to rewrite the program entirely. This subproject will explore automatic programing techniques for using the experience of generating the old program to greatly reduce and simplify the generation of the new program.

Chairman ELLENDER. Again, I note that Harvard University and Massachusetts Institute of Technology are among your performers. How much of this total you are requesting for fiscal year 1973 is for work to be performed by these two institutions?

Dr. LUKASIK. Harvard is scheduled to receive $250,000 and MIT $1,750,000.

PICTURE PROCESSING

Chairman ELLENDER. The $15.5 million requested for information processing techniques includes $2,150,000 for the project entitled "Picture processing." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The program goals are to develop photographic image processing techniques which substantially reduce the communications bandwidth required to transmit pictures and which permit the restoration of blurred or otherwise degraded pictures. In order to obtain pictures in real time from reconnaissance systems and remotely piloted vehicles, high resolution television systems are required: however, practical restrictions on the available communications bandwidth limit the resolution possible. Theory indicates it should be possible to markedly reduce the volume of data which must be communicated to represent a picture thereby permitting the transmission of more detailed pictures. Also, such compression would permit substantial reductions in the costs and delays associated with the storage and dissemination of pictures within DoD. A second goal of this subproject is to develop efficient techniques for the generation and synthesis of realistic images by computer, starting from a numerical description of the scene. The ability to generate in real time a moving display of a complex scene such as an aircraft landing would permit very large savings and improvements in simulation and training systems.

Strong military requirements have led to substantial applications work and near-term developmental activity within DoD. However, virtually no basic research has been done except as a by-product of university research. This project fills this gap and develops a strong foundation for the military applications work of the Rome Air Development Center, the Naval Electronics Laboratory and the Army Electronics Command, the Defense Communications Agency, and the Defense Intelligence Agency. Computer production of artificial pictures has broad application in all three Services, particularly in Air Force and Navy flight training, where the initial techniques developed are currently being considered for operational use.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment briefly on the objective of this effort.

Dr. LUKASIK. The primary objectives of this program are to develop basic knowledge of how to transmit and store pictures economically, and how to recover or enhance obscured details in a picture. By computer processing, we can now achieve a bandwidth reduction by a factor of 6 to 7, with equivalent reductions in transmission and storage costs, and yet there is no loss in picture content regardless of how the results are measured. We are making significant progress in restoring pictures blurred by poor focus or motion. We expect to improve these methods, largely by optimizing them in terms of human vision char-

acteristics. We are developing means to generate realistic pictures of solid objects in motion by means of a computer. Such pictures can be generated rapidly, so that this capability will be valuable for training and simulation, and for planning and design where proposed changes can be quickly tested for their effects on the overall system under design.

Chairman ELLENDER. Are the services doing any work in this area?

Dr. LUKASIK. The services and the intelligence community are currently employing relatively simple and well-known techniques of coding and picture enhancement. The ARPA program technology goes well beyond these present-day methods in our search for new, faster and more economical techniques for the recovery and enhancement of pictures. In the area of picture compression to reduce storage and transmission costs, practically nothing is being done today and it is for this reason that the ARPA program is putting considerable emphasis on this area.

Chairman ELLENDER. How much of the total requested for fiscal year 1973 is for work to be performed by the Massachusetts Institute of Technology?

Dr. LUKASIK. MIT's program in digital speech and picture processing will be extended for 1 year at a cost of $100,000.

Chairman ELLENDER. Just what do you plan to do with the $2,150,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. Participants in this program will be the University of Utah at a $1,500,000 level, the University of Southern California at $550,000, and the Massachusetts Institute of Technology at $100,000. At Utah, the development of hardware for real-time computer generation of artificial images will be completed and applied to simulation of aircraft landings. At USC, research will center on developing standardized measures of picture quality to permit rapid and objective comparison of techniques for encoding and decoding color and monochromatic images. MIT will continue research in filtering, coding, and enhancing sound and image data by digital means.

Chairman ELLENDER. When do you expect this initial effort to be completed?

Dr. LUKASIK. All our current research efforts in picture processing are scheduled to achieve their objectives by fiscal year 1975.

INTELLIGENT SYSTEMS

Chairman ELLENDER. The total requested for "Information Processing Techniques" includes $6,040,000 for the project entitled "Intelligent Systems." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objective of this subproject is to develop the theory and capability to permit the automatic solution by computer of very complex problems involving planning, generalization, learning, and the interpretation of sensory information. The subproject includes work in automatic interpretation of visual scenes, understanding printed English text, substantially better information retrieval and query analysis, planning a course of action to accomplish a given command, and the theoretical work necessary to achieve these developments.

This work is related to, and a necessary prerequisite for, the achievement of real progress and lower costs in both automatic as well as semi-automatic or

computer-aided performance of the following DoD tasks: interpretation and correlation of electronic sensor-gathered intelligence data; tactical information reduction; strategic defense systems; planning of very complex operations and projects; photo interpretation, target finding and target tracking; sophisticated information retrieval, query analysis and question answering; intelligence analysis.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment briefly on the objective of this project.

Dr. LUKASIK. Intelligent computer programs have been created which can analyze visual scenes to recognize simple objects; verify the correctness of simple computer programs; discover new and significant results in organic chemistry; prove new—though relatively simple—theorems in mathematics; and manipulate mathematical expressions to solve problems in algebra, calculus and differential equations. Mechanisms have been developed which can "see," follow simple English commands, and solve the problems necessary to explore their environment. We have also developed the mathematical proof procedure basis for automatic question-answering, problem-solving, planning, and program synthesis; developed a program that serves as a powerful mathematical assistant to the applied mathematician; and developed a comprehensive theory that describes, for a common class of machines, the precise extent of their learning and generalization capabilities. With these significant accomplishments already behind us, we feel that the experienced group of researchers on this subproject are making excellent progress toward our objective of developing the capability to have computers consider large quantities of complex, real world information and form generalizations and plans based on the totality of information.

Chairman ELLENDER. Are the three services doing any work in this field and, if so, how are your efforts coordinated with those of the services, and why do you feel that they are not duplicative in nature?

Dr. LUKASIK. ARPA is coordinating the work in this project with the intelligence agencies and the services. Progress in these areas is important for the intelligence agencies, especially in intelligence analysis and question-answering systems. NASA is sponsoring some developmental work on intelligent systems for space exploration based on ARPA research results. The Army, through the Army Research Office in Durham, N.C., is sponsoring a few tangential research projects in machine intelligence, including some theoretical work. The Office of Naval Research is monitoring ARPA's intelligent systems work at Massachusetts Institute of Technology. With the exception of these relatively small efforts, ARPA's research program is the only U.S. activity in this domain.

Chairman ELLENDER. I note that this project requires substantial funding; $5.3 million was made available in fiscal year 1971, $6 million was made available in fiscal year 1972, and as I indicated, you are requesting a little over $6 million for fiscal year 1973. Just how do you determine the level of funding for this project?

Dr. LUKASIK. The intelligent systems project is the backbone of ARPA's computer science research, and is the only research of its kind in the country. Results arising out of this research have had, over an extended time period, a greater impact on the course of future computer development than any other single source. The current $6 million

level represents a carefully structured program that distributes a somewhat limited supply of qualified researchers to cover a selected number of critical technological areas which we believe offer the greatest potential for future developments that will be of benefit to the Department of Defense. Because we believe so strongly in the value of this basic research as the wellspring for maintaining a continuing flow of new ideas into the development cycle, we have elected to keep this project at the $6 million level in spite of an overall reduction in the IPT program.

Chairman ELLENDER. How much of the total requested for fiscal year 1973 is for work to be performed by the Massachusetts Institute of Technology?

Dr. LUKASIK. MIT is programed to receive $1,650,000 for work on intelligent systems in fiscal year 1973.

Chairman ELLENDER. Comment on the objectives of the program planned for fiscal year 1973.

Dr. LUKASIK. In order to achieve significant advances in automatic programing and speech understanding, it is necessary to have a major improvement in automatic problem-solving and machine planning. In fiscal year 1973 we hope to obtain significant improvements in the capability of computers to help in these areas. Currently it is possible to automatically form simple, two- or three-stage plans to solve problems like constructing a three- or four-module computer program or, in human terms, planning how to get around an unexpected roadblock. During the coming year this planning capability should improve to a truly useful point, permitting the solution of far more complex problems such as automatically generating useful computer programs in restricted problem domains. This improvement will have direct impact and utility in speech understanding, automatic programing, self-repairing systems, error-tolerant computer languages and many other areas. Also, similar progress is expected in natural language interpretation, visual scene analysis and symbolic mathematics manipulation.

Chairman ELLENDER. When was this effort initiated, and how much has been funded for this effort through fiscal year 1972?

Dr. LUKASIK. The intelligent systems subproject was formed in fiscal year 1969. During the 4-year period fiscal year 1969–72, $19.6 million has been committed under this subproject.

SPEECH UNDERSTANDING

Chairman ELLENDER. The $15.1 million requested for Information Processing Techniques includes $3,250,000 for a project entitled "Speech Understanding." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objective of this subproject is to develop prototype systems capable of responding meaningfully to spoken, connected speech. The use of natural spoken English as an input language to computers would revolutionize the effectiveness and utility of computer systems for the vast majority of DOD personnel. Speech is the only human output media fast enough to keep up with thought processes and, as such, will permit a user to interact with a computer without the inevitable frustration and loss of time caused by using typewriters for input as is necessary now. Furthermore, the use of spoken English would free

the user's hands and eyes, eliminate the need for extensive training, and could permit inexpensive and simple microphones and telephones to replace terminal input equipment.

However, to achieve a successful speech understanding capability the entire process, from the initial analysis of speech signals to the interpretation of the meaning of the English statement, must be considered. Traditionally speech recognition research has not gone far beyond isolated word recognition. Only by considering the semantic content or meaning of a statement can errors in the initial speech interpretation be corrected. The subproject, therefore, involves research at all levels from analysis of the acoustic waveform and recognition of phonemes to syntactic and semantic content of English sentences.

Chairman ELLENDER. Comment briefly on the objectives of this effort.

Dr. LUKASIK. The objective of this effort is to radically change man-machine communication by allowing people to control computers with spoken commands and queries. Achievement of this object would, for example, make it feasible for a high level commander to interact directly with a machine without requiring intermediaries or specialized training, and without having to devote his entire attention to the machine itself.

Chairman ELLENDER. Are the services doing any work in this area?

Dr. LUKASIK. Speech recognition research is currently being pursued by the military services and intelligence agencies primarily for the purpose of voice identification and key word recognition. The ARPA research program is primarily focused on understanding speech from a cooperative user with respect to a known semantic context or data base and thus will not aid significantly in the recognition of speech from uncooperative sources. The research, therefore, is almost totally complementary to other ongoing speech recognition programs; only small portions of fundamental theory are common to both. To obtain maximum mutual benefit, however, a strong, cooperative interaction has been arranged with the Rome Air Development Center and NSA.

Chairman ELLENDER. When was this project initiated, and when would you expect to complete it?

Dr. LUKASIK. Although this subproject was formally inaugurated in fiscal year 1972, some research formerly identified with the intelligent systems subproject can be identified as its direct predecessor. This research concentrated on the feasibility of understanding very simple commands given in connected spoken English and in understanding reasonably complex typed English language sentences and thus formed a substantial basis on which to build this program. Also in fiscal year 1971 a thorough feasibility study was conducted which showed that the technology could support the speech understanding goals if a sufficient effort was made over a 5-year period.

Chairman ELLENDER. What is the total estimated cost of this effort?

Dr. LUKASIK. Including the relatively small startup costs in fiscal year 1971, the cost of this subproject through fiscal year 1976 is expected to be $19.4 million. Of this amount, $11.8 million will be spent during the fiscal years 1974–76 period.

Chairman ELLENDER. At the end of fiscal year 1976, after the expenditure of $11.8 million, what do you expect to have as an end product of these efforts?

Dr. LUKASIK. It is expected that a prototype system will have been developed. This prototype system will be capable of answering questions and responding to commands which are spoken by a cooperative speaker in a quiet environment and which pertain to the subject mat-

ter of the system. The existence of such a prototype will demonstrate the feasibility of an orally controlled computer system and thus make possible the long sought goal of direct and intimate coupling between man and the computer.

TECHNICAL STUDIES

Chairman ELLENDER. The total requested for ARPA includes $6.1 million for Technical Studies. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This project provides support to ARPA, the Office of Defense Research and Engineering (ODDR&E), and the Office of the Secretary of Defense in funding short term scientific and technical investigations on problems of major significance to Defense. These investigations cover proposed solutions for technological problems as well as state-of-the-art reviews in Defense-related technologies or disciplines

Chairman ELLENDER. What is the nature of these studies, and what organizations of the Department of Defense are involved in them?

Dr. LUKASIK. The studies performed under this project provide technical analyses that explore various defense problems in depth. The purpose of these analyses is to help responsible Defense officials to ascertain the long-range implications of the country's R.D.T. & E. programs, and the impact that various technical issues could have on the U.S. defense capability. These analyses include studies of military systems and implications for future defense programs and systems. The studies also identify new technological areas that are ready for development and that can profitably be exploited, and they explore the operational and strategic implications of these advances.

The results of these analyses are valuable to the defense staff in terms of informing them of the technical, cost, and operational consequences of alternative decisions that might be made. Such study results serve to clarify the options available in defense areas of great complexity.

ARPA, O.D.D.R. & E., and the Office of the Secretary of Defense are involved in assigning studies that are funded under this program element. The studies themselves are performed by not-for-profit organizations.

Chairman ELLENDER. Of the total requested for fiscal year 1973, how much is for work to be performed by the Institute for Defense Analyses?

Dr. LUKASIK. The fiscal year 1973 budget request for Technical Studies is $6.1 million. Of this amount, approximately $3.7 million is for work to be performed by the Institute for Defense Analyses.

Chairman ELLENDER. On page 68 of the descriptive summary, in connection with the program for fiscal year 1972, I note the following statement:

"Studies are continuing in fiscal year 1972 on a number of technical fields of importance to defense. These include strategic gaming, laser propagation, tactical warfare techniques, strategic defense systems, satellite navigation, early warning, optical technology, and strategic forces communications."

I wish you would provide for the record a statement listing each of these studies and indicate those studies that will be completed in 1972 and those new studies initiated in 1972.

Dr. LUKASIK. Yes, sir; I will be glad to.

(The information follows:)

COMPLETED DURING FISCAL YEAR 1972

[Deleted.]
Vulnerability of defensive missiles to nuclear radiation and blast.
Optimizing the design of space based vehicles.
Structure of the earth's atmosphere and implication for defending against ballistic missile attack. Review of [deleted] re-entry vehicle systems for penetration.
[Deleted.]
Evaluation of underground nuclear testing methods.
Ability of strategic bombers to penetrate in an ECM environment.
Requirements for atmospheric data and solar emission radiation intensities.
Workshop on high altitude rocket plumes.
[Deleted.]
Submarine-to-submarine communications.
Simplified method for estimating aircraft payload delivery.
Use of air-to-surface and surface-to-surface missiles for interdiction strike.
Transport technology for small integrated attack forces.
Fleet air defense workshop.
Battlefield surveillance workshop.
Cost and performance of airborne navigation systems.
DOD transportation missions, capabilities, problems and systems (actual and potential).
An analysis of BULLPUP combat effectiveness using revised delivery tactics.
Ocean surveillance technology.
Performance standards for design of low light level devices.
Image quality in sampled data systems.
Optimum sequential pattern recognition.
Effects of undesired signal interferences to a coherent digital carrier.
Quantitative methods for allocation of DOD Exploratory Development resources.
Chemical processing with high powered lasers.
Propulsion system nuclear vulnerability.
An evaluation of translation by computers.
Floating platforms.
Avionics performance and costs.

INITIATED DURING FISCAL YEAR 1972

[Deleted] reentry vehicles.
Low trajectory submarine launched ballistic missiles.
Payload characteristics for ULMS.
Strategic defense during launch and midcourse phase of attacking ballistic missiles.
Implication of arms control on strategic offensive and defensive systems.
Advanced ballistic reentry systems.
Radar reconnaissance.
Infrared and night vision devices.
Controllable rocket propulsion technology.
Airborne data processing equipments.
Balloon technology.
Laser guided weapons.
Marine power systems.
Upper atmosphere phenomenology related to ABM defense.
Detecting nuclear weapon tests.
Assessment of strategic attack.
Launch and reentry systems.

ADVANCED ENGINEERING

Chairman ELLENDER. The next item is the request of $13.2 million for a series of projects under the "Advanced Engineering" category. How much was made available for projects in this category for fiscal years 1971 and 1972?

Dr. LUKASIK. Fiscal year 1971 funds in the amount of $10.625 million and fiscal year 1972 funds in the amount of $12.8 million were allocated for projects in "Advanced engineering."

Air Cushion Landing Technology

Chairman Ellender. Please comment on the request of $466,000 for the project entitled "Air Cushion Landing Technology," and tell us how your efforts in this field differ from the efforts of the Navy in the development of air cushion vehicles.

Dr. Lukasik. As you know, the Navy is applying the air cushion principle to two classes of surface ships, an amphibious one to operate in support of landing operations and a second one designed to operate as a ship in the ocean. In this program, ARPA is examining whether it is feasible to replace the conventional landing gear on high-performance aircraft with an air cushion landing system. This may allow the aircraft to operate from an unprepared surface. We are looking at the stability and flight characteristics of high-performance aircraft to determine whether this air cushion gear is feasible and what effect it may have on their flight characteristics. We will be conducting wind tunnel tests on scale model aircraft with air cushion landing gear during the coming year, and the results of these tests will be made available to the military services for application to operational aircraft.

Surface Effect Vehicles (SEV)

Chairman Ellender. The request includes $6.2 million for the project entitled "Surface Effect Vehicles." We discussed this project earlier and observed the movie on these vehicles. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description: The objective of the ARPA Arctic SEV Program is to develop the technology required to exploit the potential of SEVs as high performance military platforms for arctic operations. Major program tasks include the following:

1. Definition and quantification of the arctic environment as it relates to SEV design and operation.
2. Development of vehicle system and subsystem technology for:
   (*a*) Operation and maintenance in the severe arctic environment.
   (*b*) Operation over pack ice, open water, and arctic terrain (tundra, muskeg, etc.).
   (*c*) Safe, high-speed operation in all arctic weather and lighting conditions.
3. Development of an obstacle avoidance system responsive to both ice and conventional terrain obstacles and with accuracies compatible with the maneuvering and control capabilities of the craft.
4. Definition of long-range communication and navigation systems compatible with Arctic operation.

Related Activities: From a basic technology standpoint the ARPA Arctic SEV Program is related to the Navy's Surface Effect Ship (SES) and Amphibious Assault Landing Craft (AALC) Programs. However, the SES involves significantly different technology since the SES is not amphibious, has rigid, surface-piercing sidewalls and employs hydrodynamic propulsion. The AALC, while amphibious, is designed for short range ship-to-shore operations and it has significantly less obstacle traversing capabilities than would be required for Arctic use. The ARPA Arctic SEV program will, of course, utilize the technology developed for the SES and AALC programs whenever possible, thereby eliminating duplication of effort.

FY 1972 Program: A computerized Arctic terrain data bank, which stores heights, slopes and frequencies of occurrence of terrestrial and ice obstacles, was developed to serve as the forcing function in parametric design analysis. Experiments will be initiated in late FY 1972 to determine the ecological impact of SEV

operations over tundra. Measurement of the radar cross-section of Arctic ice and snow and the attenuation of radar energy in snow, ice, fog, and warm fog resulted in the selection of 10 and 94 GHz frequencies for the terrain sensing system. Laser testing has resulted in the selection of a 10.6 micron system as the third sensor in the hybrid system. (Three sensors will be utilized to maximize the performance of the system for any given snow or fog condition.) The Navy Navigation Satellite System has been selected as the means for accurate position and azimuth determination, while the reference system between fixes will be Loran-Omega or an inertial system. SK–5 tests were completed and the reduction of test data is underway. Numerous analytical procedures have been developed to facilitate the determination of SEV parameters such as required lift-to-drag ratios, cushion characteristics and maneuvering and control and skirt depth requirements. Contractor effort was initiated in parametric design analysis, skirt system development, vehicle dynamics analysis, maneuvering and control investigations, propulsion system design, structural design, cushion investigations, propulsion system design, structural design, cushion subsystem analysis and reliability and maintainability and lift support system studies.

Chairman ELLENDER. Are your efforts in the area of surface effect vehicles exclusively for the use of such vehicles in the Arctic?

Dr. LUKASIK. Yes; the ARPA effort is specifically directed toward developing the technology required to exploit the potential of surface effect vehicles as high performance military platforms for arctic operations. However, in areas such as terrain sensing, maneuvering and control, and vehicle dynamics, the work being sponsored by ARPA will be also applicable to the design of surface effect vehicles for operation in other parts of the world.

Chairman ELLENDER. Tell the committee why you do not feel that your efforts in developing surface effect vehicles duplicate the efforts of the Navy in the development of surface effect ships and their air cushion vehicles.

Dr. LUKASIK. From a basic technology standpoint the ARPA program is related to the Navy's surface effect ship and the amphibious landing craft programs. However, the surface effect ship involves significantly different technology since it is not amphibious, has solid sidewalls and employs hydrodynamic propulsion. The landing craft, while amphibious, is designed for short range ship-to-shore operations and has significantly less obstacle traversing capabilities than would be required for Arctic use. The ARPA Arctic SEV program will, however, utilize the technology developed for the surface effect ship and landing craft programs where it is applicable, thereby avoiding any duplication of effort. That is why we have chosen the Naval Ship Research and Development Center as the technical organization for the project.

Chairman ELLENDER. When was this effort initiated, how much has been spent on this project to date, when do you expect to complete the project, and what is your total estimated cost of this effort?

Dr. LUKASIK. The surface effect vehicle program was initiated late in fiscal year 1970 and funding through fiscal year 1972 totals $13.6 million. We expect to complete the technology program in fiscal year 1975 at a total estimated cost of $29.5 million, however, a decision on whether to proceed with the design, fabrication, and testing of a demonstraton vehicle will be made during fiscal year 1974.

Chairman ELLENDER. I note that you expect to complete the development of this technology in fiscal year 1975. What do you plan to do after the completion of this technology development program?

Dr. LUKASIK. When ARPA completes its phase of this program, we expect that the military services will take over the program, and will utilize the technology in their normal procurement cycle for the acquisition of the vehicles necessary for the satisfactory performance of military operations in Arctic regions. Should the technology development program be very successful, we may be able to initiate the transfer of the program to the services during fiscal year 1974.

Chairman ELLENDER. Give us some idea of what you expect to do with the $6.2 million you are requesting for fiscal year 1973.

Dr. LUKASIK. The major segment of the fiscal year 1937 program will be a technology development effort by contractors and by the Naval Ship Research and Development Center. This will be a continuation of the ongoing work in design analysis, in skirt development for satisfactory performance, at the low arctic temperatures, while traversing pack ice and the rough arctic terrain, in vehicle dynamics analysis, in maneuvering and control investigations including the development of an obstacle avoidance system which will be responsive to both ice and conventional terrain obstacles for high speed operation, in the selection of propulsion systems, in structural design, in cushion dynamics, and in reliability and maintainability in the severe arctic environment. Development of the critical terrain sensing subsystems for safe, high-speed operation in all arctic weather and lighting conditions, including fog and snow, of stabilizing systems and pilot display components, will be completed. We are planning to start the navigation subsystems, compatible with arctic operation and we will continue tests to determine any possible effects of SEV operations on tundra.

MARINE VEHICLES

Chairman ELLENDER. The total requested for advanced engineering includes $2,646,000 for the project entitled "Marine vehicles." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description: This program is directed toward the development of technology concepts for advanced marine vehicles. The program includes research on the hydrodynamics of small, high speed (deleted) vehicles, and development and evaluation of specific test vehicles. The program also includes research on advanced chemical power and propulsion systems which will increase the underwater operating capability of chemically powered submersibles. Also included is research on new techniques for communications with patrolling submerged submarines.

Related Activities: Work on this program and related activities is in progress at various Navy organizations including the Naval Ship Research and Development Center (NSRDC), Naval Undersea Research and Development Center (NURDC), Naval Research Laboratory (NRL), Naval Electronic Laboratory Center (NELC), and the Office of Naval Research (ONR).

Chairman ELLENDER. What is the objective of this project?

Dr. LUKASIK. Under this program we are exploring the technologies basic to the development of advanced small submersibles, [deleted]. The program includes research on the hrydodynamics of small, high-speed, [deleted] vehicles, and the construction and testing of specific vehicles to verify the design calculations. These tests are carried out in tow tanks and in the open ocean. The program also includes research

on new types of power and propulsion systems to increase the capabilities of submersible vehicles. [Deleted.]

Another objective of this program is the development of improved techniques for [deleted] communication with submarines patrolling on station, and between submerged submarines. Research is continuing on [deleted] acoustic techniques [deleted] on [deleted] techniques for direct, two-way communication between a submerged submarine and an aircraft, and on the use of [deleted] signals which can reach submerged submarines.

Chairman ELLENDER. How are your efforts in this field coordinated with the efforts of the Navy?

Dr. LUKASIK. Coordination of this research at various decision-making levels within the Navy are of key importance to me. Specifically ARPA maintains close liaison with the Assistant Secretary of the Navy, Research and Development, Deputy Chief of Naval Operations, Submarine Warfare, and Director, Antisubmarine Warfare Programs, to insure that our research is directed at the highest priority and highest payoff issues facing the Navy in this or other areas and that our research complements activity under way or planned with the Navy research establishment.

In addition, Navy commands are utilized as ARPA agents for the contracting of all such research and much of the research is accomplished at Navy laboratories or with Navy contractors to allow for rapid and efficient transfer of our results and ideas into the appropriate Navy organizations with a minimum of difficulty. In several instances special ad hoc review groups consisting of appropriate Navy, ARPA, and DDR & E personnel have been established to monitor the progress of research on a continuing basis.

Chairman ELLENDER. What do you plan to do with the $2,646,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. The principal effort will be on extending our study of the hydrodynamics of [deleted] bodies. Thus far we have been using a very small body, which could be adequately tested in the tow tank at the Naval Ship Research and Development Center. [Deleted.] We are also planning to continue the development of high-energy underwater power systems in order to make possible longer duration and longer range missions for small submersibles. In addition to the work on chemical reactions providing increased energy per unit weight and per unit volume, we will also continue the development of the Brayton, Stirling, and Feher thermodynamic cycles, which offer the promise of improved efficiency in developing mechanical power from the chemical power sources.

Additionally, specific underwater acoustic and [deleted] communication systems will be developed and underwater tests will be conducted to determine the improvements in range performance [deleted] these systems make possible. Work will also be done on large aperture sonar arrays to determine whether such sensors could be developed [deleted].

STABLE FLOATING PLATFORMS

Chairman ELLENDER. Please comment on the request of $980,000 for the project entitled "Stable Floating Platforms."

Dr. LUKASIK. The primary development objective of this program is the achievement of practical, mid-ocean floating platforms which are

of possible interest to all the services for use in future strategic and/or logistic support activities. The concept will provide for both longitudinal and transverse dimensional growth capabilities for any given installation requirement. The dimensional growth of the floating platform would be accomplished by sequential additions of compatible, modular, floating units.

Since they are designed to be very stable, their potential uses include support of large acoustic arrays for ASW, platforms for radar for the off-shore detection of aircraft and missiles, as well as platforms for the logistic support of on-shore combat operations. They can also benefit oceanographic research such as that directed to ocean properties affecting sound and light propagation which could lead to improved sonar and submerged communication techniques.

Ocean Monitoring

Chairman Ellender. The total requested for Advanced Engineering includes $1,688,000 for the project entitled "Ocean Monitoring." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description: This program involves several areas of marine technology including the extension of the capabilities of deep submersibles, research to determine the feasibility of a [deleted] sonar system in the ocean, a study on the effect of ocean surface conditions on the transmission of radar waves, and the development of a technology for controlling harbor siltation and beach erosion.

Fiscal year 1972 program: Instrumentation for the submerged navigation will be developed and field tested. Instrumentation will be developed and field tested for mapping continuous gravity profiles and magnetic field strengths near the ocean floor. Basic radar measurements will continue to develop methods of obtaining directional spectral properties of ocean waves. This development, if successful, has important implications to successful over the horizon radar applications.

Fiscal year 1973 Planned Program: Tests will be conducted of the improved navigation system of the deep sea research submersible to determine the improved capability it provides for near ocean bottom surveillance. Tests will also be conducted utilizing local magnetic and gravitational anomalies for the navigation of a submersible. Detailed measurements will be made of the interaction between the surface conditions of the ocean and radar waves to determine whether this technique can [deleted]. A [deleted] will be tested at the Atlantic Undersea Test and Evaluation Center, if the results of the 1972 measurements indicate potential feasibility.

Chairman Ellender. What is the objective of this project?

Dr. Lukasik. The primary objectives of this program are to extend our capability to examine the ocean floor and to conduct operations in the deep ocean. In order to do this we are extending the capabilities of deep sea submersibles, especially in the development of new navigation techniques, and we are examining the feasibility of utilizing the [deleted] techniques developed for radar systems to determine whether it is possible to develop a [deleted] sonar system which would enable us to conduct detailed investigations of the ocean floor, and to detect and locate objects in the ocean, through the use of sonar array towed by a surface ship. Another objective of this program is to examine the effect of the ocean surface on radio wave transmission, and to determine if the ocean surface structure can then be examined in detail using

radio frequency techniques. Success of this approach would offer the opportunity of tracking ships [deleted] by their wakes on the ocean surface at great distances.

Chairman ELLENDER. How is this effort coordinated with the efforts of the Navy in this field?

Dr. LUKASIK. As outlined previously coordination with other Navy activities is carried out on a continuing basis. In this area of research ARPA concentrates on advanced techniques which if successful could make a dramatic improvement in our ocean monitoring or deep sea navigational capability which complement Navy activities primarily directed at more near term improvements. Several of the projects utilize common facilities, laboratories and institutions to insure that maximum communication and coordination are achieved, thus eliminating any potential duplication.

Chairman ELLENDER. Comment on the objectives of your planned program for fiscal year 1973.

Dr. LUKASIK. In 1973 we will work toward determining the feasibility of utilizing magnetic and gravity measurements for submerged navigation. This concept, if successful, would eliminate the need for submerged vehicles to surface to make navigation corrections. Another focus is the measurement of the stability of acoustic propagation characteristics over short time intervals. We hope that the measurements will show that it is possible to design a new type of advanced sonar, [deleted] in which the physical size does not limit the resolution that could be obtained. The planned experiments require extremely sensitive measurements of the motion of the sonar system while the acoustic wave travels. The success of the program depends on our successful completion of the propagation measurements. The third focus is understanding the reflection of radio frequency waves from the ocean surface and the effect on the radio wave interaction with the ocean surface when the passage of a ship [deleted] creates a wake [deleted].

ARCTIC OPERATIONAL TECHNOLOGY

Chairman ELLENDER. The total requested for advanced engineering includes $1,220,000 for a project entitled "Artic Operational Technology." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description [deleted].

This program is investigating the acoustic transmission characteristics of the Arctic Ocean, especially in the marginal arctic seas, where acoustic transmissions are severely distorted and continually changing. Instrumentation is also being developed for measuring the properties of ice and snow in the arctic.

Fiscal year 1971 and Prior Accomplishments: The effort has been directed primarily toward the technology required to measure acoustic propagation in the marginal sea ice zone, techniques for navigating and communicating in these areas, and for building requisite weapon homing devices. Studies were initiated on the technical requirements for operations in the arctic, and efforts were initiated for the development of the necessary instrumentation for acquiring detailed data on the arctic environment as it affects military operations. These efforts include initiation of a program to develop an unmanned arctic research

submersible for making measurements of the contour of the lower surface of the arctic ice pack, and of the acoustic propagation characteristics of the Arctic Ocean between the ice pack and the ocean floor; and the development of a remote automatic station for acquiring, recording, and transmitting oceanographic and meteorological data. Studies of ice dynamics, the formation of pack ice, and programs for determining thin areas in the ice pack where submarines could surface were initiated. Also, efforts were initiated on equipment required to determine ocean characteristics, such as salinity and temperature profiles in arctic regions, with particular reference to acoustic propagation.

Fiscal year 1972 program: Comprehensive studies of technological requirements for operations in arctic regions were completed and provided to the military services. These studies identified several systems with critical development items [deleted] and arctic air-mobile tactical force, and a general purpose large ice breaker ship. Efforts initiated in prior years on the technology required to conduct operations in the marginal sea ice zone, and for developing equipment to determine its acoustic properties, are being continued. Experiments were carried out with a remote infrared sensor which determined the feasibility of locating ice pockets below the surface of the permafrost. A symposium was conducted at which experts on the logistics of Arctic region operations conferred on programs to improve U.S. logistics capabilities. Effort is continuing in the cooperative program with the U.S. Coast Guard for the development of a sea ice penetrometer for rapid determination of ice thickness from an aircraft in flight.

Chairman ELLENDER. Tell us what you plan to do with the $1,220,000 you are requesting for fiscal year 1973.

Dr. LUKASIK. We will continue to emphasize the technology remarines in the arctic and to improve our capability to conduct arctic [deleted] operations. An unmanned [deleted] submersible research system will be employed to gather arctic acoustic data with particular reference to submarine operations. Little is known about the character of acoustic propagation beneath the arctic ice pack. The submersible research system will permit us to understand the absorption, scattering, and refraction of acoustic energy in this environment. It will also be utilized to measure the thickness of the ice pack and to determine the lower profile of the ice. [Deleted.]

Another research effort included in this program is a study of the near surface structure of sea ice and of permafrost, using acoustic techniques. This may lead to a simple technique for determining the thickness of the ice pack, or of the permafrost region.

STRATEGIC TECHNOLOGY

Chairman ELLENDER. The next item is the request of $78.6 million for several projects in the strategic technology category. How much was made available for these projects for fiscal years 1971 and 1972?

Dr. LUKASIK. The amounts are shown on this tabulation I am submitting for the record.

[In thousands of dollars]

Projects/function	Fiscal year—		
	1971	1972	1973
Advanced strategic concepts and strategic technical analysis	8,240	7,350	7,000
Midcourse, reentry, and special measurements analysis	4,600	2,500	0
High energy laser technology	16,300	21,000	26,400
Midcourse and special infrared optics	13,400	13,500	15,000
Advanced concepts technology	8,709	9,500	9,600
Surveillance technology	9,100	11,200	16,900
Special applications technology	2,900	4,700	3,700
Applied supporting research	1,750	2,150	0
Total	64,999	71,900	78,600

Chairman ELLENDER. Generally speaking, what are the objectives of these projects?

Dr. LUKASIK. The Strategic Technology Office program elements include advanced strategic concepts and strategic technical analysis—STA—high energy laser technology, midcourse and special infrared optics, advanced concepts technology, surveillance technology, and special applications technology.

The advanced strategic concepts and strategic technical analysis activity emphasizes the analyses of technology-based strategic developments and plausible hypothesis in order to assess their potential in the context of new weapons or defense systems. Selected postulated developments are analyzed in detail and followed by the definition of measurements and experimental demonstration programs when the studies indicate that there could be a major impact on the strategic posture.

The high energy laser technology program provides the advanced technology base on which the multiservice advanced development program builds. The primary objectives are the exploration, development, and demonstration of next generation or novel types of efficient high power/energy laser system concepts with significantly improved capabilities over present systems for military applications. These include lasers generating pulsed or continuous wave form using chemical, electrical, combustion, and other pump power sources such as magneto-hydrodynamic—MHD—generators, advanced pointing and tracking techniques and new coherent signal processing techniques [deleted].

The midcourse and special infrared optics program pioneers in key technology areas needed for advanced [deleted] system components [deleted].

The advanced technology program concentrates on several kinds of activities; laboratory research and field measurements of hydrodynamic phenomena related to advanced submarine detection concepts. Space defense investigates ground-based and space-borne surveillances. Optical effects investigations include both the physical factors such as atmospheric irregularities and mixing of such chemical factors as triatomic metal oxides or electronic induced radiation which affect infrared emission from a nuclear explosion. Plume physics investigates the aerodynamic and radiation behavior of rocket plumes at high altitude through laboratory and field measurements.

The surveillance technology program centers on activities of over-the-horizon—OTH—radar technology, ocean surface surveillance, and advanced communication research.

The special applications technology effort concentrates on advanced methods and techniques to support O.D.D.R. & E., the services, and the intelligence community.

ADVANCED STRATEGIC CONCEPTS AND STRATEGIC TECHNICAL ANALYSIS

Chairman ELLENDER. The total requested for strategic technology includes $7 million for the project entitled "Advanced strategic concepts and strategic technical analysis". Comment briefly on the objectives of this project.

Dr. LUKASIK. Advanced strategic concepts and strategic technical analysis concentrate on divergent aspects of those technologies which apply to strategic systems. The former explores plausible strategic concepts to define those technologies which may be required to support such concepts while the later explores novel or unconventional

hypothesized foreign weapons capabilities which can be shown to be technically plausible but which have not yet been observed. [Deleted.]

From the latter activity we attempt to anticipate [deleted] confirm or disprove the hypothetical developments. In both the Advanced concepts and strategic technical analysis programs the results of the studies are essential in shaping, characterizing and guiding new and advanced technologies in other strategic technology areas.

Chairman ELLENDER. Give us some idea of what you expect to do with the $7 million you are requesting for fiscal year 1973 for this project.

Dr. LUKASIK. Approximately two-thirds of the money represented in this category is applied toward technology based analyses and studies concerning plausible strategic developments through which we attempt to characterize postulated systems in the context of new offensive or defensive concepts. From these analyses, the identification of immature, potential, or emerging technology areas is made for subsequent research consideration.

One million dollars of this program has been identified to support the development of advanced concepts for early warning. [Deleted.] The program during this fiscal year will continue the exploratory development phase and concentrate on the application of advanced statistical and analytical techniques as well as the demonstration of program results.

HIGH ENERGY LASER TECHNOLOGY

Chairman ELLENDER. The total requested for strategic technology includes $26,400,000 for the project entitled "High energy laser technology." Comment briefly on the broad objectives of this effort.

Dr. LUKASIK. ARPA is concerned with next generation, order-of-magnitude developments in laser technology, including novel approaches which offer for the first time the possibility of much greater efficiency along with fuel, size, waveform or wavelength flexibility. Because of new discoveries in atmospheric propagation characteristics at wavelengths other than those at which current lasers operate [deleted] these advances lead to a significant increase in the effective ranges of laser [deleted] systems such as those now being developed by the services, [deleted]. Moreover, in addition to providing the technical options for future service applications, ARPA is also devoting a large measure of its resources in this area to making the critical propagation and threat damage measurements at the more extrenuous energy levels which will enable service planners and designers to consider more demanding laser [deleted] applications with technical confidence. Finally the ARPA program attempts to establish the fundamental properties and laws which determine laser properties and effects to provide a scientifically sound basis for extrapolation and to avoid the need for many costly, purely empirical measurements.

Chairman ELLENDER. How are your efforts in this field coordinated with the efforts of the services in the field of high energy laser technology.

Dr. LUKASIK. The total national high energy laser program is closely coordinated and balanced between ARPA and the three services, ARPA is concentrating on exploring the new concepts, new materials, and new approaches in making laser systems work. The services are

developing applications of current demonstrated technology. This division means that ARPA investigates next generation laser devices and pointing and tracking technology together with determining [deleted] propagation, [deleted]. The services have advanced development programs directed toward test bed systems [deleted]. Supporting pointing, tracking, propagation, [deleted] work is done by the services in sufficient detail to support their particular applications. Almost all of the application category is carried by the services while ARPA supports [deleted] of the next generation laser developments. Several of the service programs in next generation laser technology are joint programs with ARPA; and other service programs follow directly from ARPA-supported work. This transfer of technology provides the services with the basis for prototype systems in the long term while providing near term alternatives to upgrade capability and/or to circumvent roadblocks discovered in the test bed programs.

Activities are coordinated with the service programs both directly by ARPA and through D.D.R. & E. with ARPA serving as the lead coordination group for the DOD high energy laser technology program. Detailed coordination and cooperation are accomplished through the operation of interservice committees, headquarters staff cooperation, and direct day-to-day communication with the various service organizations responsible for program execution. Within the Air Force there are direct relations with the Weapons Laboratory, Kirtland Air Force Base, Albuquerque, N. Mex., Rome Air Development Center, Rome, N.Y., and the Aeropropulsion Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio; within the Navy there are direct relations with the Naval Ordnance Systems Command and the Naval Research Laboratory, Washington, D.C.; within the Army, close contact is maintained with the Army Missile Command, Huntsville, Ala.

Midcourse and Special Infrared Optics

Chairman Ellender. The total requested for strategic technology includes $15 million for the project entitled "Midcourse and special infrared optics." Comment briefly on the broad objectives of this project.

Dr. Lukasik. The infrared work in the Strategic Technology Office is centered in the [deleted] which is directly related to the detection and tracking of distant targets [deleted]. This application is mainly directed at the possible use of such sensors [deleted].

The ARPA sensor technology is being developed in response to system requirements. Over the past 3 years sensitivity of [deleted] sensors has been increased.

Chairman Ellender. Just what is the need for the increase of $1.5 million that is requested for this project?

Dr. Lukasik. [Deleted] was initiated in fiscal year 1972 in the midcourse and special infrared optics program elements. The peak funding requirement is in fiscal year 1973 for procurement of sensors and boosters. The $1.5 million increase results from these hardware procurements to meet the September 1973 flight schedule. Funding of the experiment will be completed in fiscal year 1974 with the planned expenditure of $12 million. [Deleted.]

Advanced Concepts Technology

Chairman Ellender. The total requested for strategic technology includes $9,600,000 for the project entitled "Advanced Concepts Technology." Comment briefly on the objectives of this effort.

Dr. Lukasik. The general objective of the advanced concepts technology effort is to resolve specific key technology issues critically related to the feasibility or vulnerability of advanced or present strategic system concepts. The specific current activities in fiscal year 1973 address the [deleted] extension of the technology and basic understanding critical to the feasibility of advanced satellite systems [deleted].

Chairman Ellender. Just what is included in your planned program for fiscal year 1973?

Dr. Lukasik. [Deleted.]

Surveillance Technology

Chairman Ellender. The $78.6 million requested for strategic technology includes $16,900,000 for a project entitled "Surveillance Technology." Comment briefly on the broad objectives of this effort.

Dr. Luasik. The surveillance technology effort is based on a broad outlook and concern about long-range and short-range strategic surveillance requirements and the closely related functions of command, control, and especially communications. ARPA is obtaining the basic data base on atmospheric and ocean attenuation and clutter in a comprehensive manner to satisfy current applied concepts and future requirements for all the services. ARPA performs an important mission in insuring that this data base is broad enough and comprehensive enough to satisfy the longer term service requirement. [Deleted.] Further and detailed description of specific goals are expounded in the answer to the next question.

Chairman Ellender. The $16.9 million requested for this program represents an increase of $5.7 million over the sum provided for fiscal year 1972. What accounts for this very large increase?

Dr. Lukasik. The increased budget requested for surveillance technology in fiscal year 1973 will enable initiation of a new effort in [deleted].

Fiscal year 1973 is the first year of the [deleted] program [deleted]. This new program is budgeted in fiscal year 1973 at $2 million.

In the area of [deleted] ocean surveillance, in fiscal year 1973, we will be accelerating our efforts to develop and demonstrate advanced techniques [deleted].

[Deleted.] The additional cost for the acceleration of this effort, estimated at $1.7 million, is to build a test bed to advance and optimize these [deleted] techniques as soon as possible.

[Deleted.] The [deleted] development and procurement is estimated to cost $2 million in fiscal year 1973 and $3.5 million total.

Special Applications Technology

Chairman Ellender. The last project in the "Strategic technology" category is "Special applications technology," for which $3,700,000 is requested. Has the committee been provided with the details on this request?

Dr. Lukasik. Yes; that information has been given to the committee.

SEISMIC VERIFICATION RESEARCH

Chairman ELLENDER. $7,405,000 is requested for a project entitled "Seismic Verification Research." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This is the major part of the national effort to improve our capability to detect, locate, and identify underground explosions. The work is mainly concerned with the development and evaluation of methods and techniques for differentiating between the seismic signals produced by earthquakes and underground/underwater nuclear explosions. The effort includes work to develop the theoretical means for distinguishing between seismic signals produced by earthquakes from those produced by explosions; and the design, construction, and utilization of the seismic arrays required to acquire the data base for test of the theoretical work.

Chairman ELLENDER. Does this total effort involve the detection, location, and identification of underground nuclear explosions?

Dr. LUKASIK. Yes, the total effort is directed toward these goals with a view to providing the best possible research base from which decisions may be made on underground nuclear test ban issues. The research has particular emphasis on the identification of seismic events at low magnitudes, below 4.5, because the present ability to distinguish between earthquakes and explosions above this magnitude is generally well understood.

NUCLEAR MONITORING RESEARCH

Chairman ELLENDER. The next item is the request of $30,700,000 for several projects included in the "Nuclear monitoring research" category. The tabulation on page 28 of the justifications listing each of the projects included in this category will be included in the record at this point.

(The information follows:)

[In thousands of dollars]

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Nuclear monitoring research	36,454	35,900	30,700
Safeguards/verification:			
Seismic verification research	11,702	9,606	7,405
Evasion research	5,746	4,566	2,590
Treaty verification/weapons security	641	1,398	1,600
Total	18,089	15,570	11,595
Prime Argus:			
Diagnostics—Nuclear techniques	5,749	5,988	4,135
Diagnostics—Physical and chemical techniques	5,594	3,296	1,945
Total	11,343	9,284	6,080
Military systems survivability:			
Wake detection/hydroacoustic	501	2,368	2,200
Rapid excavation	2,838	3,597	3,900
Vulnerability/hardening	1,185	1,112	1,700
Total	4,524	7,077	7,800
Environmental impact/control research:			
Fluid injection/waste disposal	2,468	2,778	2,025
Environmental research	30	1,191	3,200
Total	2,498	3,969	5,225

Chairman ELLENDER. How is ARPA's effort in this field coordinated with the efforts of the Atomic Energy Commission and the [deleted]?

Dr. LUKASIK. The programs of all three organizations have been and are effectively and closely coordinated. The technical programs are reviewed prior to implementation to establish the research goals and priorities. Every effort is made to insure that overlapping is avoided and the efforts of each agency are directed toward an integrated program. [Deleted.] The Atomic Energy Commission, through the Division of Military Application and the Lawrence Livermore Laboratory, coordinates closely in the study of near-in seismic signals from nuclear explosions and also in the crucial area of possible test ban evasion techniques. Periodic meetings, in which representatives of the Arms Control and Disarmament Agency also participate, are held to review results and progress toward the established goals. We have found that this process works most effectively.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973.

Dr. LUKASIK. In fiscal year 1973 we propose to continue our efforts to determine the origin of seismic events at magnitudes below m_b 4.5. This is at the heart of the problem—whether the science of seismology can or cannot identify in a routine and efficient manner, small seismic events. This will have considerable impact on discussions of a ban on underground nuclear tests.

A significant contribution to this research has been made by the ARPA large array program. The three large aperture seismic arrays, LASA in Montana, NORSAR in Norway, and ALPA in Alaska, are now fully operational and are providing high quality seismic data being used by investigators to test discrimination criteria. At the same time we shall be continuing our research effort into the automation of processing the large amount of data that flows from these arrays.

Another part of the identification program, the long-period experiment, has 11 three-component very long-period seismometers located in different parts of the world that are also beginning to provide data to investigators. These seismometers record at different seismic frequencies than do the seismometers located in the three large arrays. We expect these seismometers to be particularly useful in developing criteria that will help us identify an unusual class of earthquakes, which are known to be earthquakes, but which have many of the seismic characteristics of explosions. This is a particularly crucial issue which involves the false alarm problem.

EVASION RESEARCH

Chairman ELLENDER. The total requested includes $2,590,000 for the project entitled "Evasion Research." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This program investigates techniques that a foreign government might use to evade detection, or deny identification or clandestine nuclear tests conducted in violation of a Comprehensive or Threshold Test Ban Treaty. Possible evasion techniques by the Soviet Union and other countries are being evaluated, as well as possible countermeasures to the use of each technique.

Four possible techniques for reducing or masking the seismic signals from underground nuclear explosions have been investigated: conducting tamped ex-

plosions in dry porous material instead of hard rock, conducting tests in cavities, hiding the explosion signal in the signal from an earthquake, and detonating multiple explosions in a deliberate manner so as to produce earthquake-like seismic signals.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment on the objectives of this project.

Dr. LUKASIK. At the very beginning of the VELA project, at a time when emphasis was being given to developing the seismic capability needed to monitor a test ban treaty, it was believed that despite improvements in seismic capabilities it would be possible to detonate underground explosions that would either not be detected or if detected would not be identified as an explosion. Thus, when Project VELA was assigned to the Department of Defense, evaluation of evasion techniques was one of the objectives of the project. We have, for example, demonstrated that if a nuclear device were detonated in a proper-sized cavity that the seismic signals could not be detected at teleseismic distances. In addition to other nuclear experiments, we have conducted a number of theoretical efforts that have indicated that several evasion techniques can defeat efforts to detect or identify nuclear explosions by seismic means and this work will continue. In cooperation with the AEC we are also planning further experiments to demonstrate the practicality of evasion techniques. Clearly, discussions of how a comprehensive test ban treaty can be verified should include not only an understanding of what seismic verification can be expected to accomplish but an understanding of the techniques that could be used to nullify seismic verification. Similarly this knowledge can be used to establish evasion countermeasures for inclusion in the design of future seismic monitoring systems.

Chairman ELLENDER. As I understand the descriptive summary data, you expect to complete this program during fiscal year 1973. Am I correct about this?

Dr. LUKASIK. At the time that the descriptive summary was prepared, it was intended that fiscal year 1973 would be the final year of funding of the evasion program. The intention was to pursue the theoretical work on those problems still unsolved which are crucial to a more complete understanding and appreciation of evasive testing, for example, the decoupling effects of nonspherical and nonsymmetric cavities and the possibility of deliberately enhancing the surface wave energy from an explosion so that the seismic signal appears to have originated from an earthquake. However, it now appears that the technical questions involved in certain evasion techniques will become increasingly important to assessing the utility of seismic verification. Furthermore, a thorough understanding of the practical consequences of evasion techniques is required in order to implement evasion countermeasures into a seismic verification system. Accordingly, it seems most prudent at this time to obtain experimental data for those techniques which potentially threaten such a system, and in particular conduct a practical demonstration of the "multiple shot" and "hide in an earthquake" techniques which have hitherto been treated by analytical and computer simulation techniques only. Thus, in the light of the increased emphasis that seismic verification has recently received, we intend to pursue evasion research further in cooperation with the AEC and ACDA, beyond fiscal year 1973, and we expect to

make an appropriate submission as part of our fiscal year 1974 budget request.

Chairman ELLENDER. When was this program initiated, and how much has been made available for it through fiscal year 1973?

Dr. LUKASIK. The evasion program was initiated under Project VELA in 1959. Through fiscal year 1973, $55,739,000 will have been made available for this research.

TREATY VERIFICATION AND WEAPON SECURITY

Chairman ELLENDER. The request includes $1,600,000 for a project entitled "Treaty verification/weapon security." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The objectives of this program are: (1) to develop techniques and methods that will provide the capability to monitor adherence by signatory nations to arms limitation agreements, and (2) to insure that essential safeguards for weapons security are developed. Included in the program is research to develop greatly improved means of detecting foreign nuclear weapons that are in transit or deployed and nuclear weapons that may be brought across U.S. borders. Investigations are being conducted to evaluate the impact of nuclear proliferation on national security and to assess the threat posed by the possibility of nuclear weapons being constructed by various types of non-national organizations.

FY 73 Planned Program.—Test and evaluation of nuclear radiation detectors will continue to verify performance and develop operating characteristics. Research projects to develop or improve BW–CW treaty safeguards will commence in accordance with the program now under development. Limited RDT&E projects related to proposed safeguards for other disarmament agreements will be initiated as the objectives are identified.

Chairman ELLENDER. Comment briefly on the objectives of this program.

Dr. LUKASIK. As you know, a number of arms control agreements have been negotiated in the recent past and other agreements are currently under discussion. If these agreements, present and future, were violated by foreign signatories, the national security of the United States could be adversely affected, with perhaps grave consequences. To prevent this from happening, the Department of Defense believes it necessary to develop and maintain the best possible verification system, particularly for these arms control measures which entail the highest risk in the event of an undetected violation. In some instances, existing intelligence surveillance techniques are satisfactory for monitoring the terms of an agreement. In other cases, such as a possible chemical warfare agreement, existent surveillance techniques are not satisfactory. It is these deficiencies which the ARPA program will address.

A second purpose of this program is to investigate the problems inherent in maintaining the physical security of weapons and detecting the presence of weapons. The principal thread of our research is to develop improved detector materials and detection systems for nuclear radiation. These detectors could be used in many situations: Verifying the presence of nuclear materials in warheads, detecting stolen or diverted weapons, surveillance of ships, planes, and missiles. The major problem with existing systems is their very limited operating range. The ARPA program should result in an order of magnitude improvement.

PRIME ARGUS

Chairman ELLENDER. The total requested for nuclear monitoring research includes $6,080,000 for the project entitled "PRIME ARGUS." What are the objectives of this project?

Dr. LUKASIK. The overall objective of this project is [deleted].

MILITARY SYSTEMS SURVIVABILITY

Chairman ELLENDER. The total requested for nuclear monitoring research includes $7,800,000 for a project entitled "Military systems survivability." What are the broad objectives of this program?

Dr. LUKASIK. This program is addressed to three different aspects of survivability, forecasting the vulnerability of installations to nuclear explosions, the protection of essential facilities by means of deep underground emplacement, and [deleted]. These seemingly different aspects of survivability are linked here because they have to a large degree a common scientific base. Under the VELA project we learned a great deal about rock mechanics, the coupling of explosion energy with rock, and ways to model such coupling with computer codes. We also developed ways to detect seismic signals produced by explosions and earthquakes at great distances by seismic arrays and we developed techniques to automate processing the data acquired by large arrays.

Now it so happens that developing an improved method to calculate the vulnerability of installations to nuclear explosions must be based on an understanding of how the bomb energy is coupled with rock and modeling this coupling by elaborate computer codes. The construction of deep underground emplacements by present technology is almost prohibitively lengthy and expensive and clearly some new technique or techniques must be developed to break hard rocks if deep underground emplacements are to become a reality. Again the science developed by the VELA project is proving to be of crucial importance as the research in rock mechanics done under VELA is being applied to the understanding and development of new techniques for breaking rock. [Deleted.]

WAKE DETECTION AND HYDROACOUSTIC

Chairman ELLENDER. Of the total requested for military systems survivability, $2.2 million is for the project entitled "Wake detection/hydroacoustic." Has the committee been provided with details on this request?

Dr. LUKASIK. Yes, that information has been submitted to the committee.

RAPID EXCAVATION

Chairman ELLENDER. Of the $7.8 million requested for Military Systems Survivability, $3,900,000 is for a project entitled "Rapid Excavation." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The goals of this project are to develop techniques for excavation of deep underground tunnels and chambers in hard rock that will reduce by 30–50% the cost of construction (today a 13' x 20' tunnel at a depth of 5000' costs more than $1,000 per ft.) and increase excavation rates by 200–300 percent over

current rates of 75–100 ft./day with blast and muck techniques. Such improvements are needed if the U.S. is to have the option in the future for deep underground emplacement of military facilities. The research conducted to achieve these objectives spans all phases of underground excavation with emphasis being given to developing more efficient ways of breaking rock. The Bureau of Mines, Department of the Interior and the Department of Transportation are developing a complementary rapid excavation program related to soft rock excavation. The ARPA program is in cooperation with the Bureau of Mines.

FY 1973 Planned Program: Work will continue in all of the technical areas for which support was provided in FY 1972, but the results of the FY 1972 program will enable the selection of those techniques proven practical and most technically promising. There will be a reduction in total number of contracts but an increase in funding level for specific contracts and a slight increase in the overall program cost as a result of full scale field tests of the most promising ideas.

PROGRAM OBJECTIVE

Chairman ELLENDER. Comment on the objectives of this program.

Dr. LUKASIK. Conventional mining is an exceedingly slow process. One of the inhibiting factors in considering deep underground emplacements has been the long leadtime of conventional techniques. If this constraint were substantially removed by significantly shortening the time required to excavate the necessary chambers and their associated shafts and tunnels, then the United States would have a viable option of placing important military facilities underground. The purpose of this work is to determine if innovative research can develop a new system for rapidly excavating rock. Such a new system will require developing new ways of breaking rock, new ways to remove the broken rock from the face, and also new ways of insuring the stability of the resulting openings. The program, now in its second year, shows great promise and is well managed by the ARPA agent, the Bureau of Mines.

Chairman ELLENDER. On page 113 of the descriptive summary, I note the following statement: "The goals of this project are to develop techniques for excavation of deep underground tunnels and chambers in hard rock that will reduce by 30 to 50 percent the cost of construction (today a 13′ x 20′ tunnel at a depth of 5,000 feet costs more than $1,000 per foot) and increase excavation rates by 200 to 300 percent over current rates of 75′ to 100′ per day with blast and muck techniques." Why is this a proper effort for the Department of Defense?

Dr. LUKASIK. The chief reason why this is a proper effort for the Department of Defense is that it is only the Department of Defense that is faced with the problem of developing a system for very rapidly excavating deep openings in hard rock. The Department of Transportation has a small research effort directed toward improving near-surface excavation techniques primarily of vehicular tunnels, but this is not sufficient to solve the DOD problem. The Bureau of Mines of the Department of the Interior is interested in developing rapid excavation technologies and, indeed, they are recognized experts in this field. The Bureau of Mines is naturally primarily interested in rapid excavation as it would be applied in the mining industry where major attention must be given to excavation in coal mines and the relatively soft rocks surrounding ore bodies, particularly in relation to industrial health and safety. The Bureau of Mines research program will in no way produce the rapid excavation system needed by the Department of Defense either. However, the recognized expertise of the

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Bureau of Mines was utilized by Department of Defense in starting a new program using the Bureau of Mines as its agent. This program is solely intended to meet the DOD needs. Essentially the answer to your question is that the DOD has a unique need that cannot be met by the normal programs of other Government agencies and we must provide for our solution of our problem.

Chairman ELLENDER. Does the Bureau of Mines provide any funding for this effort?

Dr. LUKASIK. The Bureau of Mines will, in fiscal year 1973, spend a little over $1 million on research which can be associated with objectives of the ARPA funded work. The Bureau of Mines provides the technical management of the ARPA project; I might add that we have been very pleased with the manner in which they are managing this difficult and complex project.

VULNERABILITY AND HARDENING

Chairman ELLENDER. The request includes $1.7 million for the project entitled "Vulnerability/Hardening." Comment on the objectives of this program.

Dr. LUKASIK. The first objective of this program is to develop a method that greatly improves our capability to predict the vulnerability of military installations to nuclear explosions. Current predictive models are much too generalized to be useful. However, as a result of a better understanding of the coupling of nuclear explosions with various kinds of rock and new advances in computer technology and application we believe it may be possible to develop much more realistic predictive models. As I mentioned previously the better understanding of rock mechanics and coupling stems from work done as part of the VELA project. Our Information Processing Techniques Office is responsible for the advances in computer technology and application.

The second objective is to determine if it is possible to communicate from command centers to strategic forces by means of solid earth transmission paths. The problem of communicating with strategic forces in event of a nuclear attack is under constant study in the Department of Defense and this is one of several possible approaches. Geophysicists have suggested that radiofrequencies might be transmitted for long distances in the earth's crust. As the transmitter would be deep underground it would be much less vulnerable to attack than antennas on the surface. Radiofrequencies, of course, can be transmitted through solid rock under certain circumstances but experience to date has shown that these distances are very short. The first goal of the proposed research would be to determine whether the postulated transmission paths exist.

Chairman ELLENDER. What do you plan to do with the $1.7 million you are requesting for fiscal year 1973?

Dr. LUKASIK. The bulk of the requested funds will be used to start a theoretical and experimental program to develop a way to predict the attenuation of shock waves produced by nuclear explosions under different geologic conditions, and to develop a way to predict the interaction of underground structures with the surrounding rock during the passage of the shock wave. This work will require experiments with high explosives. Other work will be concerned with the develop-

ment of sensors for measuring in situ properties of rocks and the preparation of computer programs that take into account a large variety of rock properties. We will also start a program intended to determine if in fact radio waves can be transmitted through deep portions of the earth's crust, and under what circumstances.

FLUID INJECTION AND WASTE DISPOSAL

Chairman ELLENDER. $2,025,000 is requested for a project entitled, "Fluid injection/waste disposal." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Techniques to measure in situ stress, fluid pressure, permeability, and strength of reservoir rocks will be refined and tested. Rock failure criteria applicable to underground waste disposal will be defined. Numerical models used to calculate the seismic potential of a given fluid injection project will be improved and tested. Case histories on a number of fluid waste disposal activities and reservoir loading behind dams will be documented and the findings and conclusions integrated into research projects.

The evaluation of regional subsurface environments in terms of waste emplacement potential will be continued and more complete geologic and hydrologic field data on deep saline aquifers will be acquired. Geologic, hydrologic and engineering criteria for evaluating the feasibility of emplacing nonradioactive noxious or hazardous solid and encapsulated liquid wastes in salt deposits will be established and assessments made of the environmental impact of this approach to waste disposal.

Chairman ELLENDER. What are the objectives of this effort?

Dr. LUKASIK. As you will remember, the Army was placing waste fluids into a deep well at the Rocky Mountain Arsenal near Denver until earthquakes began to jar the Denver area. Three of the earthquakes had magnitudes of about 5.2. Fortunately, no serious damage resulted, and the Army stopped pumping wastes down the well. ARPA undertook to determine if fluid injection could produce earthquakes, and we have now demonstrated by experiments in the Rangely oilfield in Colorado that injecting water into an active fault will indeed produce earthquakes. I might note that geophysicists believe that the Rangely experiment gives reason to believe that much the same technique, injecting water into an active fault, could be used to prevent damaging earthquakes from occurring along the San Andreas fault in California by reducing the in situ stress in a gradual manner—an interesting byproduct of DOD research. The Department of Defense still needs to dispose of noxious fluids that cannot be burned or dumped into rivers or the ocean but we cannot inject these fluids into the ground unless we can be certain that such an activity will not result in hazardous earthquakes. Nor can we risk contamination of sources of ground water. The program then is designed to provide criteria needed to evaluate whether and under what circumstances toxic wastes can be safely and economically stored in subsurface geologic formations. The objectives are to establish methods for determining if a potential waste disposal site is in an area that has adequate subsurface storage capacity; determine if storage zones are isolated from usable ground water and valuable minerals; and determine if the retention time is adequate and if the area is free from seismic and other hazards.

Chairman ELLENDER. What other agencies of the Federal Government are involved in this broad area?

Dr. LUKASIK. The U.S. Geological Survey and NOAA are conducting related research in earthquake engineering connected with nuclear

reactor safety in seismically active regions. EPA is conducting investigations of the feasibility of national disposal sites for a wide range of hazardous materials. The ARPA effort is primarily concerned with evaluating the potential for subsurface storage of noxious wastes in deep boreholes as an alternative to several possible approaches to waste disposal. EPA and the USGS are both investigating the water quality degradation threat of surface and shallow well disposal practices. The AEC is exploring the potential of salt cavities for storage of radioactive wastes. ARPA's investigation of the storage of wastes in impermeable rocks deals with geographical and logical constraints not necessarily in common with AEC waste storage problem. The overall ARPA effort is concentrating on subsurface waste storage problems which are considered unique to DOD facilities and their contractors.

Chairman ELLENDER. How are the efforts of these Federal agencies coordinated?

Dr. LUKASIK. Two panels, with overlapping memberships coordinate work in this area. One panel is primarily concerned with the field experiments in the Rangely oilfield in Colorado. In addition to representatives of ARPA and the Geological Survey one panel member is on the faculty of the Colorado School of Mines and one member represents the Army Research Office. Representatives of the Defense Science Board and the Office of Science and Technology have attended meetings of this panel.

A second panel is concerned with coordinating theoretical and laboratory work. In addition to ARPA and the Geological Survey the Bureau of Mines and the Air Force Office of Scientific Research are represented. We think the panels have been eminently successful in their work, and have contributed materially to the success of the program to date.

Chairman ELLENDER. Comment on your planned program for fiscal year 1973.

Dr. LUKASIK. The fiscal year 1973 program is designed to provide more definitive answers to such questions as what geologic and hydrologic features characterize an area that is suitable for subsurface waste injection; what data need be obtained at a potential site to determine if injection is feasible; how can one avoid, minimize, or control seismic activity that may be triggered by fluid injection; and are there geologically stable sites where a highly toxic waste can be stored indefinitely so that it can be inspected, monitored, or retrieved, at any time, and are relatively safe even in event of disaster. The technical approach will be to relate theoretical and laboratory studies of earthquake triggering mechanisms and interactions between the waste and the surrounding rock and water to actual situations through field studies and case histories of existing injection wells in different environments. In addition, pilot regional investigations will be conducted to test and refine computer simulation models which have been developed for evaluating the mechanical, thermal, and chemical effects of waste emplacement at a potential storage site.

ENVIRONMENTAL RESEARCH

Chairman ELLENDER. The last item in the nuclear monitoring research category is the request of $3,200,000 for the project entitled

"Environmental Research." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This is a new program initiated in FY 1972. Work is beginning to develop computer models of the time varying global ionosphere that will predict for any given location and time the major characteristics of the ionosphere, such as the electron and ion densities. Present models are very limited; important physical forces due to electric field systems and neutral wind systems, for example, have been inadequately represented. Both theoretical and experimental studies will begin to examine the earth's trapped radiation belts in space and the interaction of the trapped particles with radiofrequency waves. The studies will examine wave/particle interactions as they affect amplification and ducting of radiowaves and cause trapped particles to precipitate into the high latitude auroral regions.

Pilot studies are being initiated to identify the long term environmental problems caused by or affecting DOD activities. Emphasis will be given to those problems where the long term effects are uncertain and the underlying scientific principles poorly understood. Studies to develop a program of earthquake control will begin with the anlysis of ARPA studies of fluid injection, including an oil field experiment.

Chairman ELLENDER. Comment on your objectives.

Dr. LUKASIK. The ionospheric layers existing from about 80 kilometers to 400 kilometers above the earth significantly affect all military radiofrequency surveillance systems and communication systems both for ground-to-satellite propagation and ground-to-ground propagation by ionospheric reflection. A major reason for developing a better global model of the ionosphere is to improve day-to-day operations of the many military radiofrequency systems, for example, by providing a more informed basis for choosing frequencies that will propagate well and for the interpretation of and reaction to spurious effects from natural disturbances. Better knowledge of the ionosphere is also important for the efficient design of new systems.

The study of wave interactions with the earth's trapped radiation particles extending out to several earth radii has application to several important military studies. [Deleted] determining the limiting values of particle radiation that could be trapped in the earth's geomagnetic belts during nuclear warfare and hence the design criteria for hardening satellite systems to survive that environment; the feasibility of artificially stimulating the release of large numbers of the earth's trapped radiation particles to disrupt military communication and surveillance systems operating in the auroral regions. The objective of the wave/particle research is to provide a better quantitative description of this basic physical interaction that is central to all of these military applications.

The environmental issues which will be given prime concern will include the impact of decreasing natural resources on DOD, the disposal and destruction of dangerous or noxious materials other than the subsurface methods already refined to, the establishment of a DOD data base to provide authoritative input to research requirement and the preparation of environmental impact statements, and the development of sensors for specific pollutants in water and the atmosphere.

The general objective of the earthquake control program is to demonstrate the feasibility of controlling the release of stored tectonic strain along a major active fault in a manner such that the accumulated strain in a potentially dangerous earthquake-prone region can be dissipated in harmless units of seismic energy at any desired point

in time. The aim is to provide DOD with the capability to control, or prevent, major earthquakes that might damage strategic and tactical forces, major logistical installations, and urban areas in the United States and allied countries.

Chairman ELLENDER. What do you plan to do with the $3,200,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. For the ionospheric program, a detailed evaluation and comparison of existing models will be made for each of the major regions: equatorial, midlatitude, and polar. A standard data base for common input parameters such as solar radiation, neutral atmosphere density, and atmospheric ionizing cross sections will be established so the limited models can be synthesized when appropriate. Studies to provide improved representation of the neutral wind systems, electric field systems, and photoelectron transport and heating processes will be started.

The wave/particle interaction studies will include ground transmitter experiments in which very low frequency waves will be propagated along magnetic field lines to cause wave amplification and particle precipitation effects that can be measured. In a joint experiment with the AEC, a rocket will be directed along magnetic field lines to release at high altitude ionized particles so that the interaction with trapped radiation particles and guided radio waves can be measured. Studies of an experiment in which ionized particles are released from a satellite will be started.

As I previously indicated, the proposed ARPA research on earthquake control would be a portion of a national earthquake hazards program. Many DOD installations are of necessity in areas where there have been damaging earthquakes and where severe earthquakes are expected to occur again. If earthquakes could be controlled in the vicinity of important DOD installations major reductions in property damage could be effected, the possibility of loss of lives eliminated, as would the possibility of loss of important military capabilities during times of crisis. The planned work is intended to determine at the earliest possible time whether earthquake control is feasible. The earthquake control research will begin with geologic, hydrologic, and seismological investigations to locate suitable experimental sites in remote areas. For passive measurements only, drill holes 2 to 3 kilometers deep will be made at two sites on the San Andreas fault. An instrument package containing sensors for the simultaneous measurements of fluid pressure, strain, temperature and seismic activity will be developed for those deep hole installations. That portion of the fiscal year 1973 program concerning the environmental effects of DOD activities will focus primarily upon those problems which have been identified in environmental impact statements as having uncertain long-term effects and whose underlying scientific principles are poorly understood.

TACTICAL TECHNOLOGY

Chairman ELLENDER. The next request is $16,100,000 for a number of projects in the tactical technology category. How much was made available for these projects during fiscal years 1971 and 1972?

Dr. LUKASIK. Fiscal year 1971 funds in the amount of $18,413K and fiscal year 1972 funds in the amount of $15,300K were allocated for projects in tactical technology.

AGILE AND COUNTERPART DEVELOPMENT

Chairman ELLENDER. $1,850,000 is requested for the project entitled "AGILE/Counterpart Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description.—This program is intended to develop those methods for the adaptation and transfer of U.S. technology which will, in turn, develop and/or further the self-sufficient conduct of military R.D.T. & E. by indigenous allied forces. Our technology comprises contemporary hardware, scientific knowledge, analytical and scientific techniques as well as skills. These efforts at counterpart development are experimental since so much is unknown about the process of technology transfer to developing countries; the ARPA work is aimed at the development of the methods for transfer and demonstration of feasibility. Selected R.D.T. & E. projects, of value to the indigenous forces, are undertaken by their R.D.T. & E. units in conjunction with ARPA staff and contractors. While the individual projects are beneficial to the host country, the core of this work is the development of methods for institutional R.D.T. & E. development.

Chairman ELLENDER. Comment on the objectives of this effort.

Dr. LUKASIK. Going beyond the objectives already provided in the descriptive summary, I would like to emphasize that this program is devoted to assisting our allies achieve self-sufficiency. Withdrawal of military aid will not by itself create self-sufficient allies; rather a principal element is the development of their capability to plan and manage their own defense resources. Here technological and management assistance becomes extremely important. The capability to build some fraction of defense material incountry, the analytical and testing skills to choose those equipments which best fit their needs, and the adaptation of logistics, maintenance, and planning methods to their problems are essential if these defense organizations are to stand by themselves. Our counterpart efforts to date have developed capable indigenous R.D.T. & E. establishments in Thailand, South Vietnam, Korea, and Iran which by their visibility are an obvious product of our work. We have in the process attained unique practical knowledge and valuable insight applicable to the transfer of U.S. skills to indigenous defense establishments. This is a research experience. We are now concentrating on the process of passing this experience on to others in DOD who will remain operationally concerned with such problems. Thus, in conjunction with the Defense Security Assistance Agency and OASD(ISA), our current work draws upon the lessons learned to evolve organizational, training, and procedural changes to current assistance methods which will promote the growth of self-sufficiency in the developing countries.

Chairman ELLENDER. What countries are involved in your planned program for fiscal year 1973?

Dr. LUKASIK. Small efforts will continue in Thailand, South Vietnam, Korea, Iran, [deleted]. We will complete turnover of responsibility for the Thai Military Research and Development Center early in the fiscal year, in October 1972, and immediately thereafter close down our Thailand activities. We are using Government personnel for our tasks in South Vietnam, Korea, Iran, [deleted]. The numbers are small; eight, five, two and one respectively, plus occasional assistance provided by specialists on temporary duty. We expect to complete even these modest efforts in South Vietnam and Korea by the close of fiscal year 1973. The major portion of our efforts within this program

during fiscal year 1973 are research tasks undertaken in the United States. This effort will utilize our experience of the past years to develop methods whereby others in DOD can effectively further indigenous country efforts at adaptation and redesign of equipment to suit their needs, at the test and evaluation of these equipments, and at the planning and management of their defense resources. In sum, we will provide tools for application by others in DOD as we phase out this research area.

TACTICAL THREAT ANALYSIS

Chairman ELLENDER. The request for tactical technology includes $900,000 for a project entitled "Tactical threat analysis." Please comment on this request.

Dr. LUKASIK. This program consists of exploratory technical analyses which may be translated to advanced technology experiments undertaken in other program areas of this office. The current work has three main thrusts.

First, it applies our knowledge of the most advanced U.S. technology now under development or being projected, to anticipate what corresponding technology the Soviets may be capable of developing. Its purpose therefore is to anticipate Soviet technological surprises in the tactical area. [Deleted.]

The second main thrust is the analysis of Soviet advanced technology to identify major technical problems with which our forces may be faced in the future. [Deleted.]

The third area is concerned with exploring the practical potential of new tactical weapons concepts and their impact on Soviet military capabilities and the counteraction that they might undertake to negate the concepts.

[Deleted.] The objective is to insure that our advanced developments are ahead of the Soviet technology of the future—not just the Soviet technology of today.

SMALL ARMS

Chairman ELLENDER. The request for tactical technology includes $2,150,000 for the project entitled "Small arms." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Description.—The ARPA Small Arms Program, in conjunction with the Army, provides the stimulus to the industrial and scientific community for advanced small arms concept formulations that will allow the U.S. to maintain a weapons superiority. ARPA investigates those potential valid concepts of unique design technology that the Army, because of the high risks, non-formulated requirements or unconventional techniques involved, is unable to pursue with any degree of persistence

Work performed by.—USASASA and NWL Dahlgren serve as agents. Primary contractors have included: Stanford Research Institute, Menlo Park, California; Aircraft Armament Inc., Cockeysville, Maryland; MB Associates, San Ramon, California; TRW Systems Inc., Redondo Beach, California; Litton Corporation, Monterey, California; and Operations Research Associates, Mountain View, California.

Chairman ELLENDER. What is the objective of this effort?

Dr. LUKASIK. The objective of the small arms program is to identify those technological innovations which offer potential for sig-

nificantly enhancing the probability of hit/kill with the individual soldier's weapons and to develop requisite technology to demonstrate the feasibility of the identified innovations. In this program ARPA is interested in applying the technology developed in other areas, such as aerospace or the materials industry, in order to examine what significant advances can be made in small arms concepts.

A very important example is the transfer of knowledge gained by the plastics industry to the development of plastic cased ammunition. This will provide the soldier with lighter weight—45 percent less weight than brass—cartridges for his small arms, thereby reducing his combat load or permitting him to carry more materiel. Plastic cased ammunition may also reduce the cost of small arms ammunition on the order of 15 percent.

Low maintenance and high reliability of small arms is yet another objective of this ARPA program. Under the stresses of the infantryman's combat environment, the infantryman needs weapons that perform under the most dire conditions. To this end, we are stressing the use of materials and lubricants in small arms to eliminate combat failures and malfunctions and reduce the efforts of propellant and climatic erosion and corrosion. Here again we are not developing new materials and lubricants rather we are investigating new applications of technology brought forth under other Government and industrial programs.

Aerospace research has given us the principles of the lifting body. These principles are being applied in our multiple projectile small arms ammunition efforts to provide the infantryman more lethal—30 percent increase—antipersonnel rounds. This increase in effectiveness will both improve the chance of favorable outcomes of military actions and, of more importance, decrease our casualties. We are also applying aerodynamic principles to the design of a ring air foil grenade which can give the individual soldier a greater range capability with his grenades than now possible.

Chairman Ellender. Comment on your planned program for fiscal year 1973.

Dr. Lukasik. The small arms research is concerned with the development of advanced concepts and new information to assist the services in determining more effective and economic future infantry weapons systems. One area of interest is a lightweight [deleted] recoilless, semiautomatic rocket launcher which will permit the infantryman to deliver large lethal rounds to repel mass attacks. We are developing a stable, in-tube burnout rocket round which will provide improved round-to-round accuracy and lethality. Although design considerations allow incorporation of various types of warhead—multiple-flechette, fragmenting, shaped charged and kinetic energy penetrator—a single warhead will be used to prove the concept feasibility.

Expanding on the objectives of small arms research, we are developing low-cost, lightweight plastic, cartridge cases. The thrust of this project is a determination of optimum plastic case materials [deleted] that can withstand the high pressures and temperatures of gun chambers and which are compatible with ammunition propellants, primers, gun lubricants and solvents.

A third project which will be continued in fiscal year 1973 is the development of [deleted] projectiles. The reason for this development

is that the range and terminal effectiveness of standard pointed nose, blunt base projectiles is seriously affected by nose shock waves and base drag. The thrust of the ARPA effort is to design an [deleted] projectile to significantly reduce the shock wave and drag and thus improve accuracy and range.

Another projectile development we will work on is the flechette. The current designs of flechettes employ a sabot to transport the small flechette projectile through the gun barrel during the firing sequence. The sabot must be discarded—broken away—from the flechette projectile upon muzzle exit. This has created cartridge design problems and inhibited the use of more than one flechette per cartridge. The ARPA effort is to develop a segmented projectile which will not require the use of a sabot.

Some other projects are designed to advance the state of the art in propellants and in weapons mechanisms and ammunition. The thrusts of these investigations are directed to: (1) investigate the potential of [deleted] for small arms projectiles, and (2) improve the accuracy and terminal effectiveness of personal defense weapons (pistols and submachine guns).

The first of these investigations is directed to an advance in propellant technology to provide significant potential for reducing the weight of both guns and ammunition. The use of high ignition temperature [deleted] as propellants will provide for better than 50 percent decrease in propellant volume and weight. In fiscal year 1973 we will continue our investigation of the use of [deleted] as candidates for a new generation of small arms propellants.

The second area of investigation is improvement in the terminal accuracy and lethality of personal defense weapons, such as the .45 caliber pistol and M3 submachine gun. We are emphasizing development of a 12-gage submachine gun and ammunition that will increase the effective range from [deleted] meters to [deleted] meters while at the same time providing [deleted] increase in terminal accuracy.

Chairman ELLENDER. Just what is the need for the increase of $910,000 you are requesting for this project?

Dr. LUKASIK. ARPA's future small arms needs study and the deliberations of the DOD Small Arms Advisory Committee concluded that to obtain a significant increase in rifle effectiveness requires development of a large caliber (10-mm. to 12-mm.) area fire weapon system. The $910,000 increase will be committed to exploratory development of this infantry area fire weapon with three types of ammunition (multiprojectile, fragmenting and antiarmor). Before addressing the specific tasks to be undertaken in this project I would like to stress the goals which we are seeking.

The area fire rifle system is directed to increasing the individual combat infantryman's effectiveness by providing him with a shoulder-fired rifle to: (1) increase by about one-third the probability of a hit on enemy personnel [deleted] (by using multiprojectile round); (2) enable the individual rifleman to effectively engage foxhole and bunker targets [deleted] without the necessity of separate grenade-launching devices (by using the fragmenting round); and (3) allow engagement of lightly armored vehicles—trucks and armored personnel carriers. As you know, these capabilities are not currently available, in a single system, to each individual infantryman.

Now more specifically, $500,000 of the increased fiscal year 1973

funding will support research leading to the development of a shoulder-fired rifle, which, when firing the large-caliber triple capability ammunition described, will not transmit the large recoil impulses normally associated with large-caliber systems. The balance will support development of the ammunition. It will focus on investigations of such projectile configurations as flechettes, scimitars, discs, and other concepts for the multiprojectile round; design and development of a microminiature bounce-up fuze for the fragmenting round; and investigations of heavy metal, [deleted] and shaped charge penetrators for development of the antiarmor round.

I feel that if this development is successful it will add a significant capability which is not now available. The area fire system has equal application to Army and Marine forces and could supplement the basic infantry rifle and grenade launchers.

Chairman ELLENDER. How are ARPA's efforts in the field of small arms coordinated with the various small arms programs of the Army?

Dr. LUKASIK. ARPA and the services are members of a DOD Small Arms Advisory Committee. Here is where the coordination of ARPA and services small arms efforts is accomplished. Through this committee, the services monitor the ARPA efforts until concepts are clarified and needs defined, after which they are further developed as service programs where appropriate. This procedure insures that the service laboratories are kept aware of progress and an orderly transition of all basic research results through developmental stages toward operational utilization is planned. To cite an example, the ARPA grenade investigations (trade-off analysis, exploratory development, and fuzing) formed the basis for Army program of continued development of grenades, grenade launchers, and microminiature grenade fuzes.

TARGET ACQUISITION AND IDENTIFICATION

Chairman ELLENDER. The total requested for Tactical Technology includes $3,500,000 for a project entitled "Target Acquisition and Identification." Comment on the objectives of this project.

Dr. LUKASIK. It is sometimes extremely difficult, in a confused battlefield environment, to determine whether the targets which are acquired by ground or aircraft sensors are friendly or enemy forces and the research we are undertaking is designed to address this problem. Our program is organized into three parts: The signature of enemy targets, their acquisition, and the identification—friend or foe, commonly referred to as IFF.

Let me elaborate on the objectives of each of these three efforts. The objective in the first area is to describe distinctive target signatures in a way that acquisition and guidance systems can exploit them. The types of signatures we are examining include acoustic characteristic signatures, IR signatures, and the target strengths to different radar frequencies or laser illuminations.

Secondly, for target acquisition we are exploring IR sensors which could be employed from ground-based and airborne platforms in support of operations involving the Army, Air Force, and Marines. Specifically, they would be used in locating enemy targets particularly during night and poor weather where our present capabilities are severely limited.

The third area deals with the problem of identification. Here our objective is to provide for the identification of friendly military elements and the detection of enemy elements with a high degree of accuracy.

This project area is, I think, extremely important since target acquisition and identification is the first step in target destruction.

Chairman ELLENDER. I note on page 128 the following statement: "Emphasis is placed upon response to urgent multiservice problem areas of considerable technologic difficulty." Give us several examples of such problem areas.

Dr. LUKASIK. One area of multiservice concern is the remote identification of airbase and ground fire support systems, vehicles, personnel, and other tactical targets in the battle area. Development of sensors which can acomplish target identification will be applicable to the Army, Navy, Marine Corps, or Air Force. We are working on the development of a forward looking infrared system which could be employed by all the services and which allows us to detect and identify targets in a battlefield environment at night and in the presence of of substantial amounts of smoke. In many areas of the world the weather conditions are such that visibility is seriously restricted. This sensor development would allow our forces to operate in fog or haze when other optical sensors may have difficulties.

Another urgent problem area is concerned with location of artillery and mortars. This problem has been quite prominent in Vietnam. This is an extremely difficult technical problem with which all the services have been wrestling. [Deleted.]

The services are quite interested in the results of this research and they are aware of the preliminiary findings as they are developed. The ARPA programs are alined with the needs of the Army, Navy, and Air Force and an orderly transition of the development work to the operational stages is planned.

Chairman ELLENDER. What do you plan to do with the $3.5 million you are requesting for fiscal year 1973?

Dr. LUKASIK. There are a number of programs planned in the major areas previously mentioned. First, we will complete the development and evaluation of a prototype long-range airborne laser target designator system that we began during fiscal year 1972. This a particularly ambitious project in which we are attempting to achieve technical breakthroughs in long-range acquisition, pointing, and tracking with a laser designation system. [Deleted.]

Another important problem is the positive identification of tanks and other moving and stationary vehicles. We have learned that Soviet tanks have certain signatures that are quite different from those of U.S. tanks. We will exploit these characteristics and will examine target signature feature extraction and other identification techniques to determine the design parameters of a tank classification system.

A third area of activity is a measurement and analysis program to determine the effects of atmospheric scattering and absorption on the return from selected laser illuminated targets in order to determine the capability of thermal imaging systems to detect and classify airborne targets. These measurements would allow us to determine the feasibility of adopting laser ranging technology to the problem of air defense target acquisition and designation.

Another area, and one in which the services have already expressed keen interest, is the development of a thermal imagery sensor based upon a unique scanning technique which allows use of nonuniform detectors. This development is expected to provide a major advancement in performance and a significant reduction in cost relative to current thermal imaging technology. Initial developments in thermal imagery sensors have successfully demonstrated a capability for acquisition of interdiction targets in Southeast Asia at night and in haze as well as daylight. Nevertheless, realization of the potential of thermal imaging techniques for weapon delivery, navigation, landing and other tasks requires considerable improvement in imagery for target recognition, reduction of physical parameters, and above all a marked reduction in cost. This program should provide these improvements.

The remainder of the funds will be directed to the artillery location and spotting problem. We have two major activities in this area. The first, which I described earlier, is the [deleted] work whose objective is the location of hostile artillery fire. The second is concerned with locating the impact points of the projectiles from our own long-range artillery. At present the Services are developing artillery rounds that will [deleted] the range of conventional artillery. With this development there comes the difficult problem of determining the shell trajectory so that the targeting can be controlled. We are examining a variety of different approaches and should be able to narrow our examination to a preferred system, which we will proceed to develop to the extent required to demonstrate the concept.

Tactical Delivery System

Chairman Ellender. The total requested for tactical technology includes $2,800,000 for a project entitled "Tactical Delivery System." Comment on the objectives of this effort.

Dr. Lukasik. The Tactical Delivery Systems Project deals with tactical nuclear weapons, antiarmor, and remotely piloted vehicles.

In the first area our objective is to identify the technical options available for modernization of our tactical nuclear weapons and clarify the advantages and disadvantages of alternate approaches. [Deleted.]

In the antiarmor area, the objective is to exploit the technology that is now available with the new materials and lubrication techniques and develop potential alternatives to our present systems. We are concentrating on technology that can make an individual soldier effective against armor and that may allow the design of a much lighter [deleted] antiarmor weapon.

In the remotely piloted vehicle program our objective is to [deleted].

Chairman Ellender. Comment on the planned program for fiscal year 1973, and then comment on the need for the increase of some $900,000 that is required.

Dr. Lukasik. In our 1973 program there are several very promising projects that I would like to describe to you. One program that should be particularly effective in reducing [deleted.]

Another important area of concentration in our antiarmor efforts is reduced visibility operations. As you know this is a severe problem in Europe [deleted]. Our program will develop methods to identify the hidden targets and direct weapons to the target [deleted].

The remaining program area that I would like to describe to you is our remotely piloted vehicle program. This is where the bulk of the $900,000 increase will be used. [Deleted.]

TECHNOLOGY BASE

Chairman ELLENDER. What is involved in the request for $800,000 for the project entitled "Technology base."

Dr. LUKASKIE. The technology base program examines important technologies which are not yet associated with a specific application and assesses the potential uses of this new technology.

The fiscal year 1973 program will examine radiofrequency interference measurements, electromagnetic propagation efforts, and millimeter wave technology. [Deleted.]

LOW COST SYSTEMS AND TECHNOLOGY

Chairman ELLENDER. The request includes $800,000 for what seems to be a new project entitled "Low cost systems and technology." Please comment on the objectives of this effort and indicate if it is in fact a new undertaking.

Dr. LUKASIK. The problem of increasing defense systems costs is one that we have all become painfully aware of in recent years. Unless we can reverse the trend whereby the follow-on generation of a weapon system costs two to 10 times what its predecessor cost, we will soon reach a state where we simply cannot afford to replace an old and possibly obsolete system. This is the problem that we are addressing in this effort. In the sense of lowering the cost of technical systems is an objective of many ARPA projects, this effort is not a new undertaking. Rather, it is a recognition that systems cost is one of the most important current problem areas and one on which we need to address as a special integrated program.

Two areas where we will initiate research efforts in fiscal year 1973 share a common objective; namely, the ability to design equipment to a specific predetermined cost. In contrast to cost estimating, designing to a specific cost places a constraint—an upper bound—on the cost and forces you to work within that bound. We will approach this research in two ways. First, we will develop methodology for determining appropriate costs to be used as design bounds; and, second, we will develop procedures—a designer's cost handbook—which could be used by engineers in the process of designing equipment to a specific cost.

A third area is related to understanding what makes equipment unreliable and thus increasing its maintenance cost and how these costs impact on the life cycle cost. The object of this research is to determine how reliability should be specified, how it can properly be measured and how it can be attained.

In each of these three research projects, we will study the costs of electronics in order to develop the needed techniques. Although this is basically a research activity, we expect in the process to greatly stimulate the field of low-cost electronics.

TACTICAL SYSTEMS APPLICATIONS

Chairman ELLENDER. The last project in the tactical technology category is entitled "Tactical Systems Applications," for which

$3,300,000 is requested. Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This program groups together problem oriented projects which are most effectively researched through the systems approach. Specific projects included are border surveillance and military operations in built-up areas, while new projects are those of restricted visibility operations and the optimization of small combat elements. Under border surveillance, sensor arrays in combination with manned patrols are field tested for their effectiveness in detection of infiltrators crossing country borders or attempting to enter military bases. The military operations in built-up areas program is intended to consolidate knowledge gained in Vietnam and to examine the modification of techniques and equipment so that such operations can be carried out with less collateral destruction and civilian casualties than have accompanied those in the past. Specific built-up area efforts include: (1) analysis of the projected threat in terms of probable situations and environments; (2) technical development in five major areas—surveillance, communications, mobility, firepower and population protections. New major portions of the systems application program include: (restricted visibility operations, which will develop hardware and techniques essential for a unique offensive/defensive combat capability. Selected developments will avoid simple extension of the human's natural sensory systems in range and resolution and will focus on system improvements in navigation, traffic control, FLIR, [deleted], communications, and barriers; (3) small combat element optimization which involves analysis and developments treating small unit operations within major force units as system elements susceptible to unified design principles vis-a-vis equipment, external support, personnel performance, and operating modes. The objectives of both of these efforts are to identify presently unrecognized technology needs and applications.

PROGRAM OBJECTIVES

Chairman ELLENDER. Comment on the objectives of this project.

Dr. LUKASIK. Expanding on the descriptive summary, this research program is an attack upon selected land combat problems which have received inadequate attention to date. One such example is evidenced by services focusing on second generation infrared and night observation devices to locate targets without equal attention given to friendly position location needs. An alternative to such approaches is to explore overt or covert battlefield illmination systems which may achieve the same goals.

Another example is evidenced by the de facto reliance on conventional equipment to fight in built-up areas given that the current doctrine generally prescribes that land combat forces should bypass urban or built-up areas whenever possible. Prior well-known engagements where a commander chose to stand and/or infiltrate to fight include Saigon, Hue, Leningrad, and Aachen. The point is that if our forces are to have the option of a significant capability in each of these problem areas, then there is a need for ARPA to point the direction that the development should take.

The problems addressed in this research program all pertain to land combat, and cannot be solved by the development of any single item of equipment but rather require a balanced combination of equipment and concepts for operation.

Chairman ELLENDER. Just what do you plan to do with the $3,300,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. Approximately one-third of this sum will be expended in the development of equipments for military operations in built-up areas overseas; for example, communications, transports, and arms adapted or designed for the constrained conflict. These developments will be a followup to our exploratory studies of fiscal year

1972 which are aimed at defining the problems and performance features unique to this type of conflict. A second third of these funds will be expended in a combination of study and developments to provide the United States with a significant offensive/defensive capability under conditions of restricted visibility. Some illustrative areas of investigation are: Position location for men, vehicles, and aircraft; barrier concepts; capability at lowest level to counter or target opponents' sensors; training methods and materials to give equivalent night flying capability to ground units; battlefield illumination as an alternative to individual sensors; and methods for field evaluation of restricted visibility capability. The last third will be used for study and developments focusing on small combat element optimization. This work recognizes that the individual technology developments for land combat—for example, antiarmor, night operations, et cetera—ultimately depend upon the small unit as their user and thus upon the integrated design undertaken from the viewpoint of this size element.

Previous ARPA work in this area has identified needed improvements in means for communication between the men in the unit as well as between the unit and its external fire and mobility support, in methods and equipments for longer range identification of friend or foe, in the integration of organic surveillance and detection equipment with the weapons carried by the unit, and in innovating testing measures to assess systems utility prior to commitment for production. Selected developments, from these or other needed improvements which may be identified in the course of further study, will be undertaken with initial emphasis likely to be given to communications and testing measures. A small fraction of the $3,300,000 will be used to complete the in-country evaluation of our previous design for a Korean counter-infiltration command and control system. This evaluation is part of our boarder surveillance efforts.

Advanced Sensors

Chairman Ellender. The next request is $13.4 million in the advanced sensor category. How much was provided for these projects during fiscal years 1971 and 1972?

Dr. Lukasik. In fiscal year 1971, $17.8 million was provided for projects in the advanced sensors category and $8.5 million in fiscal year 1972.

Chairman Ellender. As I recall, in your statement you discussed the reasons for the increase in funds for advanced sensors projects. However, I wish you would comment in more detail on just why you need the additional $4.9 million that you are requesting.

Dr. Lukasik. The Advanced Sensors Office was organized to investigate and exploit the physical sciences to improve defense-wide capabilities in acoustic, electronic, and optical data acquisition and processing, mainly with respect to intelligence and counterintelligence activities. When it became apparent, several years ago, that much of the technology developed under the auspices of this program could be applied to the needs of the Vietnam conflict, a concerted effort was begun to develop prototype equipment for special communications and intelligence problems in Southeast Asia. This major effort necessitated a drastic reduction in the more advanced and long term research activities of the office. With the increasing acceptance and support by the military services of sensor technology, it became apparent that

ARPA's catalyst role in such Southeast Asia applications could be reduced, and this was reflected in the program budget reductions from fiscal year 1971 and fiscal year 1972.

Now that his phaseout is complete, we find that it is possible to take advantage of some of the lessons learned in Vietnam as well as to capitalize on more fundamental work that was carried on at a reduced level of effort during the war.

We all now understand the advantages of unattended sensor fields for battle management, for example, but we have also come to recognize the problems of data management and interference free communication attendant on their use. In order to make the best use of this type of sensor field in future military operations certain advances will need to be made. With the completion of the DSPG program, ARPA has been assigned the responsibility within the DOD for exploratory development in this area, and because of our earlier involvement in the war, we see very well the research directions that must be taken to demonstrate feasibility of enhanced military utility.

In the other areas of optics and electronics, we are now ready to exploit some basic results in underwater optical imaging, radiofrequency transmitter location, specialized techniques of photography, radar imaging, sensor location, and so forth. It is apparent that these ideas which have been developing in the advanced sensors program over the last few years can make a substantial contribution to defense needs. We have carefully structured a program to pursue these items, which are more fully discussed in the descriptive summaries, and I believe that the increase requested for fiscal year 1973 represents the minimum additional amount necessary to pursue the research opportunities we now have in this important area.

OPTICS TECHNOLOGY

Chairman ELLENDER. The total requested for advanced sensors includes $9,825,000 for a project entitled "Optics Technology." Comment on the broad objectives of this program.

Dr. LUKASIK. The primary objective of this program is to improve our optical sensing capability in a variety of environments, such as, under the water, under nighttime conditions, [deleted] and so forth. Success in these efforts will greatly enhance the U.S. capability for long range underwater imaging. [Deleted] and for battlefield night visition.

In achieving these objectives, we are developing such items as laser sources for illumination, designation, and ranging; optical receivers including lightweight collectors, improved photocathodes, higher resolution image tubes and pyroelectric detectors.

Chairman ELLENDER. The request of the services includes substantial funds for the development of various types of sensors. Can you assure the committee that your program in this field is not duplicating the programs of the services?

Dr. LUKASIK. We take special efforts not to duplicate service programs. Because of ARPA's use of the services, as both contracting agents and technical monitors of our programs, we are able to and do have coordination with them to prevent duplication. In many instances, coordination with service programs is done through steering and working committees, usually with more than one service repre-

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sented. ARPA programs in many instances complement service programs by doing the exploratory advanced research which relates to service problems; once feasibility is attained the program is turned over to the using service.

Chairman ELLENDER. I note on page 139 that your planned program for fiscal year 1973 includes five major efforts. How much is included in the request of $9.8 million for each of these efforts?

Dr. LUKASIK. The fiscal year 1973 funding for each of the major programs under optics technology is as follows: Underwater imaging, $2.9 million; laser induced acoustic energy, $0.4 million; [deleted], $2.7 million; battlefield night vision, $2.1 million; and [deleted], $1.7 million.

Chairman ELLENDER. Give us some idea of when you plan to turn these major efforts over to the services for the continuation of development.

Dr. LUKASIK. These optical projects represent significant sensor explorations and improvements. As expected, there is uncertainty as to the degree of success these and similar programs will achieve. The richness of the veins will to some extent determine how long each is mined. In addition, closely related programs may be undertaken after these efforts are completed. Also, service interest in joint programs may extend our interest in some cases. The technology, itself, in many cases will be utilized in applicable programs as it is developed. Subject to the above, the majority of programs will be transferred during fiscal years 1974 and 1975 as is detailed further below. The program in underwater imaging consists of instrumentation for precise scientific measurements of ocean water optical quality and technology experiments to demonstrate underwater [deleted] imaging [deleted] in clear ocean water. An optical instrumentation barge facility has been developed to obtain shallow and deep water measurements. This optical barge is being transferred to the Navy as a DOD facility and is already scheduled for heavy use during fiscal year 1973.

Underwater imaging has progressed to the point where a [deleted] prototype is being fabricated. Upon completion in fiscal year 1974, it will be transferred to the Navy for evaluation by the submarine development group. Potential early uses of this equipment include high resolution imaging and identification in water depths of [deleted]. In the fiscal year 1976 period, more advanced imaging devices will be able to [deleted] enhancing deep recovery operations anywhere in the ocean. As you know, ARPA is investigating lasers to produce acoustic energy at the ocean surface for possible [deleted]. ARPA is currently investigating the fundamentals of the conversion of laser energy to acoustic energy. Next year a small demonstration is planned. Definitive transfer arrangements have not been drawn up pending the outcome of further tests and analysis but the current plan is to transfer these equipments to the Navy in fiscal year 1975.

Present plans are to complete work on the [deleted]. During the past year ARPA has achieved a hundredfold improvement in photocathode efficiency at 1.06 micrometers. Such an improvement will allow a fivefold to tenfold improvement in range for actively illuminated imaging systems for battlefield night vision. During fiscal year 1973 funds will be provided to make this improved photocathode part of an image intensifier. This technology will be transferred to all the services during fiscal years 1973 and 1974. Research work on holo-

graphic optical elements requires the results of fiscal year 1973 research before a transfer prognosis can be made. Holographic optical elements may be of higher quality and may be less expensive to replicate than ordinary refractive or reflective elements. Thermal imaging devices of battlefield night vision are currently expensive, partly because of low temperature refrigeration which is required. Our pyroelectric thermal image array program is aimed at developing a comparable quality device which needs no cooling. Fundamental improvements in these sensors are currently being evaluated in hopes of meeting this challenge. Results will have to be more definite before transfer plans are made. [Deleted.]

In conclusion I would like to emphasize that the broad based optics technology and sensor program has and will transfer very useful results and devices for service application. The nature of the program is such that discrete transfers will take place over a longer time frame rather than in large one-time events.

Electromagnetic and Electronic Sensor Technology

Chairman Ellender. There is requested $2,625,000 for a project entitled "Electromagnetic and Electronic Sensor Technology." Comment on the objectives of this project.

Dr. Lukasik. This project has two major objectives. The first is to develop advanced radars [deleted] and will obtain high resolution for the purpose of detecting moving targets. The second objective is aimed at developing sensor technology and techniques [deleted]. The information and data obtained will be utilized for surveillance, reconnaissance, and targeting. The immediate processing is particularly important for targeting on mobile equipment.

The [deleted] radar research is exploring new techniques for [deleted] coherent transmission. It is exploiting recent advancement in [deleted] signal processing technology to thwart foreign capability to detect and jam a surveillance or reconnaissance radar. This is especially critical to surveillance radars in complex electronic environment such as presented to the NATO forces. Exploration of the very short millimeter wavelength is expected to yield high-resolution radar imagery essential for night and all-weather conditions.

Chairman Ellender. The total requested for ARPA includes $24,200,000 for projects in the distributed information systems category. The tabulation on page 30 setting out each of the projects included in this request will be included in the record at this point.

(The information follows:)

[In thousands of dollars]

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Distributed information systems	12,499	18,900	24,200
Parallel processing applications	6,100	6,297	5,765
Distributed networks	4,235	6,437	7,415
Nile Blue	1,407	2,587	3,091
Secure systems	725	1,800	2,347
Advanced computer development	32	899	2,793
Sonar signal processing	0	880	2,800

Chairman ELLENDER. Comment generally on the nature of the work that is carried on under this program.

Dr. LUKASIK. The parallel processing applications subproject is the effort under which the ILLIAC IV has been developed. The machine has been moved to its operational site and in fiscal year 1973 we will begin realizing the payoff from this substantial development effort. A great many other programs, both in the services as well as ARPA, are highly dependent on future ILLIAC operations.

Our largest project in this category is the distributed networks subproject. There is no question but that this emerging technology has a tremendous potential to increase the effectiveness and lower the incremental cost of computer operations and communications within the Department of Defense and we think it is very important to push forward with this research in order to achieve these improvements at the earliest possible date. It is a very exciting and timely area of research.

In the climate dynamics or Nile Blue subproject a great deal of preliminary work has been completed in preparation for the availability of ILLIAC IV. In fiscal year 1973 we will be running a series of large numerical analyses on the ILLIAC which test the climatic prediction ability of the models and improve our understanding of the impact of environmental modifications. In other words, the subproject, like ILLIAC IV, is just entering the payoff stage.

The secure systems subproject increases in fiscal year 1973 because a 2-year task has been added to meet an immediate problem involving computer security assurance in existing DOD and DOD-contractor facilities. By solving this problem we can achieve an immediate payoff through the elimination of duplicate computer facilities now necessary, which is many times the cost of the ARPA investment.

The advanced computer development subproject was established in fiscal year 1972, pulling together a number of hardware development efforts previously located elsewhere in DIS and in the information processing techniques project. This subproject probably represents the most advanced computer development ARPA has scheduled for fiscal year 1973. The major advances in the later 1970's, which we cannot specify but which can be predicted with absolute certainty, will stem from research such as is planned under this subproject.

Sonar signal processing, which was just getting underway in fiscal year 1972, is a good example of the application of DIS R. & D. to an operational problem. [Deleted.]

Chairman ELLENDER. In your statement, you discussed the need for the increase in this category. However, I wish you would be more specific as to why you feel you need the increase of $5.3 million you are requesting.

Dr. LUKASIK. For many years there was a significant gap between basic research in the computer sciences and computer development in the services, which are generally for specific computer systems to meet needs of weapon systems or the computer requirements of various operating commands. In fiscal year 1971 the establishment of the distributed information systems program element was approved. It had as its objective closing that development gap by taking the results of 6.1 research one more step—that is, the necessary 6.2 exploratory development step between the basic research and the development of spe-

cific military-related items. The DIS budget has increased each year since fiscal year 1971 because we have found that this idea was indeed a profitable one in terms of payoff. We have significantly shortened the cycle of getting basic research results into operational use, resulting in the much earlier introduction of significant increases in cost effectiveness, as well as increased capabilities, to the ultimate users. Our experience in fiscal years 1971 and 1972 indicates that there is additional near-term payoff potential available in this area. To put it simply, we feel the fiscal year 1973 increase in this category is a good investment that will pay for itself many times over.

Parallel Processing Applications

Chairman Ellender. The total requested for "Distributed information systems" includes $5,765,000 for a project entitled "Parallel Processing Applications." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This project is investigating the application of a new form of computer architecture—parallal array processing—to a wide variety of DoD and defense-related problems for which solutions can be obtained only by a machine which is many times faster than any other system currently available.

Many important defense problems require so much computer time on existing computers that either their solution is economically infeasible or they run longer than acceptable because of real-time constraints. By utilizing the parallel machine concept this project is developing a computer, ILLIAC IV, which will overcome these limitations enabling previously impossible applications to be undertaken in such fields as ballistic missile defense radar tracking, global climate modeling, large linear programming problems such as logistics and economics, nuclear effects calculations, seismic motion prediction, and signal processing. The Advanced Ballistic Missile Defense Agency of the Army, the Nuclear Monitoring Research Office of ARPA, the Air Force Weapons Laboratory and other Government Agencies are participating in this program, developing applications programs for the ILLIAC IV computer in preparation for its availability in 1972. The ILLIAC IV will also be an important factor in the Climate Dynamics (NILE BLUE) and the Distributed Networks projects which are also being carried out by ARPA under Program Element 62706D.

Chairman Ellender. Comment on the objectives of this project.

Dr. Lukasik. Until quite recently, we have built faster computers primarily by making all their parts work faster. Now, however, we are coming up against some basic physical limitations such as the speed with which electrical signals move within the computer. There are definite limits on how fast we can make a single computing unit work. The possible solution is to enable a large number of computing units to work on the same problem at the same time. The approach we are investigating here is parallel array processing, a form of computer design in which a large number of small, fast computers all do the same arithmetic operations on different parts of a large problem. Our objective is to demonstrate the effectiveness of this concept in solving many large computational problems relating to national security. To do this, we have first constructed a large parallel processing computer—the Illiac IV—and second, organized a large and varied research program in how to use such a machine effectively.

Chairman Ellender. On page 144 of the descriptive summary in connection with the program for fiscal year 1972, I note the following statement: "Illiac IV system hardware will be completed and

the machine delivered to its operational location at Moffett Field, Calif., in 1972. A Fortran compiler will be completed. The computer will be linked to the ARPA network and compatible system software developed for this purpose. The computer will be interfaced with a trillion-bit storage device and retrieval system." Do you expect to accomplish all of the objectives of your planned program for fiscal year 1972?

Dr. LUKASIK. Most of thsee objectives have been realized. The machine has been completed and installed at NASA's Ames Research Center; it is now being tested. The trillion-bit storage device is now working quite well. We still expect that the entire system will be interconnected and attached to the network later this year. The Fortran compiler development is proceeding very well indeed. The initial version of a translator from ordinary Fortran into Illiac IV's extended Fortran is now running, and we still expect an efficient compiler to be completed late this year. Of course we expect to make improvements in both hardware and software based on our operational experience with the machine.

Chairman ELLENDER. As I understand your planned program for fiscal year 1973, you expect to have full operational use of this new computer during the second half of the year. Is this correct?

Dr. LUKASIK. Yes. We expect that use of the machine via the ARPA network will begin the first half of calendar year 1973. Initially our use of the system will be rather inefficient but, as I mentioned, improvements in hardware configuration and operating system software can be expected to bring the system up to its full potential. This kind of operational startup sequence is typical of any large computer system.

Chairman ELLENDER. When was this effort initiated, how much has been made available through fiscal year 1972, what is the total estimated cost of the effort, and exactly what will you have as the end product when you complete this effort?

Dr. LUKASIK. ARPA embarked on this program in 1965. Over the 5-year period fiscal year 1966–72, we made available $35,458,345 for Illiac IV design, engineering, manufacture, installation, and initial testing. The Army Ballistic Missile Defense Agency contributed an additional $4.5 million, and NASA funded approximately $2 million. These costs include the trillion-bit storage device and the bulk of the software development. The total cost through the start of initial operations in fiscal year 1973 is estimated at $46 million. One end result will be the physical computer system itself—the most powerful computer in the world for important classes of problems vital to our national security. Perhaps more significantly, however, we will have conclusively tested the concept of parallel computation. If it indeed turns out that this particular machine can be effectively used for a variety of problems, then the design, construction, and use of vastly more powerful machines will be a realtively simple task.

Chairman ELLENDER. To what extent do the private computer manufacturers participate in research of this nature?

Dr. LUKASIK. Private manufacturers continually produce new series of more capable machines. Indeed, two machines more powerful than any previous commercial developments will soon be delivered. However, these first-of-a-kind machines were produced for Government

customers where the existence of the Government interest and funding provided the necessary push for their design. Neither, however, has the growth potential or the possibly revolutionary impact of Illiac IV. Individual manufacturers, constrained by limited funds and the demands of the marketplace, must proceed in a highly conservative and evolutionary fashion. Historically, nearly every major improvement in computer design has been produced to meet stated government requirements, principally those of DOD and AEC.

DISTRIBUTED NETWORKS

Chairman ELLENDER. The request includes $7,405,000 for a project entitled "Distributed Networks." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

This exploratory development project was formed to capitalize on significant research progress achieved by ARPA's Information Processing Techniques project related to digital communications. The high cost and low performance characteristics of the communications facilities currently used by DOD, together with the desire to eliminate duplication of hardware, software, and manpower efforts where possible and to share special-purpose resouces whenever feasible; provide strong motivation for this project.

ARPA is coordinating with, and providing its technology to, other Defense Agencies now in various stages of planning future computer networks; e.g., Air Force logistics, intelligence agencies, Air Weather Service. Outside DOD, the National Science Foundation, Federal Reserve Board, and NASA are actively interested. Primary DOD coordination is through the office of Assistant Secretary of Defense (Telecommunications) and the Defense Communications Agency.

Chairman ELLENDER. What is the objective of this effort?

Dr. LUKASIK. Our objective is to design, build, test and evaluate a high-performance, low-cost, reliable computer network to meet the growing DOD requirements for computer-to-computer communications. In doing so we will realize the opportunity for substantial economic savings in the employment of computer resources, by sharing their use via such a network. Some intermediate objectives, among others, include the use of increasingly wider bandwidth circuits for increased effectiveness, establishing the feasibility of satellite links for worldwide defense networks, development of prototype equipment for secure communications and the development of programing techniques to enable simultaneous use of two or more network computers for more efficient problem-solving.

Chairman ELLENDER. On page 146 of the descriptive summary, in connection with the fiscal year 1972 program, I note the following statement: "Fiscal year 1972 will complete the first full year of experimental use and testing of the network." What has been the experience of this experimental use and testing to date?

Dr. LUKASIK. The network has grown rapidly during fiscal year 1972 and has proven itself to be an exceedingly important and valuable technology. The communications system which underlies the network operation has been shown to be extremely reliable and responsive to user needs and, since it is the first demonstration of the economy and effectiveness of packet communications technology, it is being closely examined by groups within our own country—and in several cases copied by foreign countries. Network usage is growing rapidly, with traffic doubling every 3 or 4 months. Within ARPA we have begun

making operational use of the net for access to remote computing resources where, instead of having to buy a computer system for a facility, access has been provided through the net to a large computer somewhere else in the country. This is not only quite cost-effective, due to reducing computer equipment expenditures, but it also considerably increases or flexibility and responsiveness in initiating new research. Before the network we were in many cases forced to select research groups at institutions with large computing resources or which were large enough to justify their own dedicated computer system. Now it is feasible to contract with small talented groups anywhere in the country and supply them, rapidly and economically, with the computer resources they require via the network. Network testing by both ARPA and the Air Force has demonstrated its capability to move large files rapidly across the country and has confirmed our early prediction that the delivery time for short messages remains about one-tenth of a second even when the net is heavily loaded.

Chairman ELLENDER. I note a reference to the Worldwide Military Command and Control System on page 146 of the descriptive summary. Just how is this effort related to this worldwide system?

Dr. LUKASIK. The Worldwide Military Command Control System employs a large number of computers throughout the world and, to insure these systems operate effectively and responsively, has a strong requirement that they be tied together into a network. This is not only to permit the flow of commands and requests between the locations but also to enable the massive files maintained at each location to be accessible throughout the system without the expensive, time-consuming and error-prone duplication currently necessary. Now that ARPA has demonstrated the feasibility of distributed network operation, the Defense Communications Agency has ordered three of ARPA's Interface Message Processors so that a prototype ARPANET operation can be established between three of the WWMCCS computers. With this test network they will develop the application-specific network software and procedures necessary for the WWMCCS operations. When this is completed and the network operation has been proven as operationally effective, the WWMCCS network will be expanded to worldwide operation.

Chairman ELLENDER. I note on page 147 the following statement: "Although it is expected that the operational responsibiilty for the network will be transferred out of ARPA in fiscal year 1974, research on resource sharing, secure operation and extension of the message communication technology to mobile consoles and remote stations will continue through fiscal year 1977." To what organization do you expect to transfer the operational responsibility for this computer network?

Dr. LUKASIK. After considerable discussion within the DOD, with Office of Telecommunications Policy, the Federal Communications Commission, and other interested agencies, it was decided to transfer the operational responsibility for the communications portion of the network to a commercial organization. The plan is to initiate a request for proposals which will request that network communications services be provided to the Government by a commercial organization. This organization would be established as whatever kind of specialized carrier the FCC decides is appropriate, and would be permitted to

sell the service on an open basis—not only to the Government but to commercial customers as well. Arrangement would be made whereby the Government-owned equipment involved would be transferred to the successful bidder in return for appropriate compensation. This transfer is expected to be completed during fiscal year 1974.

Chairman ELLENDER. When was this project initiated, how much has been made available through fiscal year 1972, what is the total estimated cost of this effort, and when do you expect to complete it?

Dr. LUKASIK. The project was initiated in fiscal year 1971. Funds made available through fiscal year 1972 total $10.7 million. We expect research and development effort on network technology to continue for 3 years at about the fiscal year 1973 level, with reductions in subsequent years until project completion in fiscal year 1977. The total estimated cost at that time would be about $37 million.

NILE BLUE

Chairman ELLENDER. The total requested for Distributed Information Systems includes $3,090,000 for the project entitled "NILE BLUE." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

Large-scale engineering projects which are feasible for major world powers may, inadvertently or by design, produce changes in world climate damaging to our security. This subproject was established in FY 70 to develop a DOD capability to evaluate the long-term effects of such actions on climate, and to determine means to counter potentially harmful climate changes.

A number of government and civil organizations are conducting related research in numerical modeling. However, these programs have distinctly different objectives, e.g., improved weather prediction, determination of meteorological data requirements, and basic research in atmospheric and oceanic dynamics. The ARPA program, closely focused on military security aspects of man-made climate change, employs existing models wherever possible, modifying them as needed to make them practical tools for climate prediction. Appropriate liaison is maintained with the military weather services, the National Atmospheric and Oceanic Administration, the Environmental Protection Agency, and the National Science Foundation.

Chairman ELLENDER. What is the objective of this program?

Dr. LUKASIK. We realize today that our environment is highly sensitive to man's ever-growing activities. A sensitive and most important part of our environment is the climate. Clearly even a small deterioration in the generally favorable climate of the United States could be highly damaging to our well-being and security. But our climate is determined in large part by the distribution of land, water, and ice on the entire globe. Many large engineering projects have been proposed by other countries to change large areas of the earth's surface. One effect of these could do to alter world climate, perhaps to our detriment. In this program, we are striving to develop means to predict the climatic effects of such projects so that world opinion can be brought to bear on the problem. I would like to take this opportunity to place on the record the fact that deliberate climate modification by the United States is not in any sense a motivation for this program.

Chairman ELLENDER. Just why is this particular project included in the distributed information systems category?

Dr. LUKASIK. The project depends heavily on ILLIAC IV, its mass storage device, and the ARPA network, all of which are part of the

distributed information systems program. These resources can best be marshaled to support the project by placing its management within DIS.

Chairman ELLENDER. I note that you plan to continue this program through fiscal year 1977. When was this project initiated?

Dr. LUKASIK. ARPA was assigned this mission by the Director of Defense Research and Engineering on November 28, 1968. The first commitment of funds was made in late fiscal year 1969 and the first research contract awarded in early fiscal year 1970.

Chairman ELLENDER. How much has been made available through fiscal year 1972?

Dr. LUKASIK. Excluding contributions to ILLIAC IV development, $3,994,000 has been made available through fiscal year 1972.

Chairman ELLENDER. When you complete this effort in 1977, what will we have as an end product?

Dr. LUKASIK. We expect to have a well-tested computer model of the earth-atmosphere-ocean system which will enable us to predict the long-term climatic consequences of major man-made projects. Many of the techniques developed for the program will be useful to the operational weather services much sooner; we expect that by 1977 some of these will have been adopted to improve both short- and long-range weather forecasts.

SECURE SYSTEMS

Chairman ELLENDER. The total requested for Distributed Information Systems includes $2,347,000 for a project entitled "Secure Systems." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The use of multi-user computer systems by the Department of Defense will be severely limited until the security of such systems can be guaranteed. This subproject is attacking the problem on two fronts, the design of inherently secure computer systems and the development of certification techniques to evaluate the security of both existing and proposed systems. To be inherently secure, the design of computer systems must be reorganized to separate and simplify the security controls. To certify a computer system, analysis and test techniques must be developed which detect potential design flaws and provide the responsible officials with technical guidance on the degree of security provided by the system.

Basic technical and policy guidance for this area was developed by the Defense Science Board Task Force on Computer Security. They found that the complexity of most supposedly-secure multi-user systems designed to date renders it virtually impossible to guarantee that they will in fact provide security for individual users. Without a concerted effort to design and certify their security, shared computers can be employed only by small groups having common security classification and need-to-know. To improve the situation ARPA is attacking the system design and certification problems, the Deputy Assistant Secretary of Defense (Security Policy) is developing a new policy which incorporates this certification guidance, and the military services are retrofitting their systems with the required security controls. All of these activities are closely coordinated so as to permit the secure use of multi-user systems as soon as possible.

Chairman ELLENDER. What is the objective of this project?

Dr. LUKASIK. To develop techniques for securing multi-user computer systems so that the Defense Department may avail itself of the inherent economies and flexibilities of these systems without compromising the security of the United States. Since the computer operating systems are the most vulnerable point currently, techniques need to be

developed to build more secure systems, and verify their security after they are built. Verification requires both analysis and penetration of the software, including the determination of its weakest points.

Chairman ELLENDER. What do you plan to do with the $2,347,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. During fiscal year 1973, work at Case Western Reserve University will be in transition from a research to a development effort; the first actual operating system based on the design principles originated by the project will be implemented. The final configuration of the University of California, Berkeley, system will undergo extensive testing and evaluation. Developmental work will begin on machine aids for analyzing computer operating systems to detect potential security flaws in the design or implementation. In addition, the Computer Security Assurance effort will analyze and test several critical DOD computer systems with the dual goal of developing security assurance techniques and developing initial recommendations to DOD on the security of those systems.

Chairman ELLENDER. On page 151 of the descriptive summary, I note the following statement: "The work to develop computer security certification techniques will be completed in fiscal year 1974 and the funding responsibility for this activity transferred to an operational agency for the examination and certification of DOD computer systems." To what organization do you expect to transfer this responsibility?

Dr. LUKASIK. The operational agency has not yet been designated. This matter is currently under discussion with the Office of the Deputy Assistant Secretary of Defense (security policy). It is the intention of the DOD to set up a computer system security certification group which can provide a comprehensive technical analysis of DOD computer systems and make recommendations to security policy as to their security.

ADVANCED COMPUTER DEVELOPMENT

Chairman ELLENDER. The $24.2 million requested for distributed information systems includes $2,793,000 for a project entitled "Advanced Computer Development." Selected paragraphs from the descriptive summary will be included in the record at this point.

(The information follows:)

The military services have a continuing need for highly efficient special purpose computer systems, for a variety of tactical and strategic applications, which are often required on a short time schedule. Such requirements can sometimes be met by accessing and utilizing existing resources via network linkage. In other cases special purpose systems—often using new system architecture—must be designed and built.

The tasks included in this subproject are coordinated through organizations interested in or supporting supplementary research on the individual tasks: The Army Electronics Command (displays and memories), the National Security Agency (mass memory), and the Rome Air Development Center (associative memories and wall displays).

Chairman ELLENDER. Does this involve a computer technology that goes beyond the ILLIAC IV computer that we discussed earlier?

Dr. LUKASIK. No; it does not involve the design and manufacture of anything of the magnitude of the ILLIAC IV. Rather, we are looking for large improvements we think can be obtained by applying new approaches, and in some cases new technologies, to specific DOD requirements.

Chairman ELLENDER. Just what is the objective of this project?

Dr. LUKASIK. One objective of this project is to develop computer hardware which meets currently unfulfilled DOD requirements for reliability and memory size. High reliability, which currently requires 200–300 percent redundancy should be feasible through the proper use of 20 percent redundancy if incorporated at the logic level. This would not only reduce the cost of such hardware but permit far longer machine life without maintenance. Another objective is to develop the advanced technology and system components for DOD worldwide data communications to permit direct computer access and intercommunication within an integrated communications system framework.

Chairman ELLENDER. What do you plan to do with the $2,793,000 you are requesting for fiscal year 1973?

Dr. LUKASIK. We plan to initiate development of a large mass memory—10^{15} bits—to meet near-term DOD requirements for large computer storage capacity for such applications as intelligence and logistics. We will also start research on extremely high density electron beam memories, which potentially can provide a hundredfold improvement in the capacity of current fast access computer memories. Work will be done on a system utilizing UHF radio—instead of land lines—to link remotely located computer terminal devices with a central computer facility. This technique shows high promise of significant improvements in the speed, flexibility, and cost effectiveness of military computer usage in the field.

SONAR SIGNAL PROCESSING

Chairman ELLENDER. The last project in the distributed information systems category is entitled "Sonar Signal Processing," for which $2,800,000 is requested. Comment on the objectives of this effort.

Dr. LUKASIK. The purpose of this subproject is to explore the application of certain areas of advanced computer technology, currently being developed by ARPA, to the problems encountered in advanced signal processing. These problems arise through the need for simultaneously considering real-time data from many geographically separated sites. The program will utilize a wide range of new processing techniques to achieve a substantial improvement in our detection and tracking capability. However, this requires large increases in computer speed and the ability to distribute geographically large amounts of data quickly. The application of the ILLIAC IV and the ARPA network technology to these problems permits major improvements not only in the overall performance but also in the ability to do research on signal processing and evaluate competitive techniques. Although this research will have general applicability to many areas of signal processing, it is valuable to choose a particular application; [deleted].

Chairman ELLENDER. I note that this program was initiated in fiscal year 1972 when $880,000 was provided. What do you expect to accomplish during fiscal year 1972?

Dr. LUKASIK. Work is underway on a research facility which will include a very advanced computer system, specialized and programed to facilitate signal processing. This system will have the capability to collect sonar array data in real-time and will provide flexible capabilities for doing complex analysis, display and recording of the data.

Advanced signal processing algorithms are under development for the ILLIAC IV. Also initial experiments are being performed to determine the optimum data compression technique to be used in the program.

Chairman ELLENDER. How long do you expect this project to be under the auspices of ARPA before transferring it to the Navy?

Dr. LUKASIK. Our tentative plan is to transfer the facility to the Navy in fiscal year 1977 after 3 years of operation. By that time the main ARPA research objectives should have been demonstrated and many of the results already transferred to the Navy. However, this date could be a year earlier or later depending on the way the program deveolps in detail.

PROJECT MANAGEMENT AND SUPPORT

Chairman ELLENDER. The last item in the ARPA request is $3,740,000 for project management and support. Would you please comment on this request.

Dr. LUKASIK. As a separate Defense agency, ARPA budgets for its own support costs. These include the salaries and benefits of ARPA's 128 civilian employees both in the Washington headquarters and in the field. The pay and benefits of 60 military personnel are not included, as they are covered by the respective services.

This program element also funds travel costs for all ARPA personnel, both civilian and military, the payment of consultants, the purchase of supplies and equipment and the payment of telephone service.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that questions submitted by him be answered for the record. The questions and the responses will appear at this point.

(The questions and answers follow.:)

SENSOR RESEARCH

Senator THURMOND. Dr. Lukasik, with the demis of the Defense Special Projects Group I assume your agency is doing the necessary research work in sensors. $13 million of the $226 million in ARPA's 1973 budget request is for sensor research. Would you define some of the key projects in the fiscal year 1973 program?

Dr. LUKASIK. The Advanced Sensors program covers four areas of work, optical sensors, electronic and electromagnetic sensors, balloon technology, and unattended ground sensors. More than half of the resources are being applied to the optical sensors which include a host of individual projects which are generally aimed at one of four applications. The first of these is the use of lasers [deleted] for imaging, and also for producing acoustic energy [deleted] as it may be applied to [deleted] communication. The second application is [deleted]. The emphasis is on obtaining optical systems which operate at high efficiencies and high resolution and also are lightweight. The third is obtaining sensors which can improve our ability to see at night on the battlefield. The fourth is [deleted].

The electronic and electromagnetic sensors are aimed at two applications. One is [deleted]. The second is the development of [deleted] radars which can detect moving targets.

In recent years there has been a renewed interest in balloons—as platforms for different applications and in balloon systems for surveillance and reconnaissance, air defense, communications relays, etc. Studies and some actual test flights have shown that a balloon system is able to perform some missions better than with other systems. This is so because balloons have been shown to have less motion relative to a target thus permitting improved integration time, processing tech-

niques, and use of moving target indicator (MTI) and mapping radar modes to separate moving and stationary targets. Another factor in this renewed interest is relative low cost of a balloon system versus the use of aircraft for certain missions. ARPA is also doing exploratory research on unattended ground sensors. ARPA is investigating techniques which will allow successful communication from remote sensors [deleted].

Senator THURMOND. Has it placed the government in any disadvantage as concerns contracts?

Dr. LUKASIK. No. The contracts will continue to be funded on a year by year basis with no interruptions in the effort provided by the contractors.

REDUCTION IN UNOBLIGATED FUNDS

Senator THURMOND. Doctor, in your statement you mention that the unobligated funds from the past fiscal year have been reduced because of congressional direction. Has this policy directive impeded or hindered the orderly and efficient conduct of ARPA's programs?

Dr. LUKASIK. High end-of-year unobligated balances have been due largely to the release of funds late in the fiscal year. Contracting officers were not able to execute the contracts before June 30th, and the funds thus remained unobligated. ARPA has made a determined effort to issue its funds earlier in the fiscal year, thereby providing the contracting officers with additional time to process the procurements. This has resulted in the changing of the annual funding cycle for a number of continuing contracts, but it has not affected the efficiency with which ARPA conducts its programs.

SPECIAL PROJECTS GROUP 1972 BUDGET

Senator THURMOND. What was the size of the last Defense Special Projects Group budget?

Dr. LUKASIK. The DSPG RDT&E budget for FY 1972 was 9 million dollars.

INCREASE IN ADVANCED SENSORS

Senator THURMOND. Dr. Lukasik, the funds for the Advanced Sensors have increased significantly over 1972. What is the basis and justification of this increase?

Dr. LUKASIK. Much of the increase in the Advanced Sensors over 1972 reflects the incorporation of unattended ground sensors. As you remember, last year when Congress terminated DSPG, the House-Senate Armed Services Conference Committee suggested that ARPA play a larger role in exploratory research in this area.

HELLFIRE PROGRAM

Senator THURMOND. Dr. Lukasik, as you know the Army is working on a program called HELLFIRE which involves a laser guided missile to enable the helicopter to launch the weapon and then leave. How does the ARPA program in the film relate to this Army project?

Dr. LUKASIK. The ARPA program which addressed a laser guided missile concentrated solely on guidance and utilized standard 2.75" rocket components. It was directed at showing the capabilities of laser guidance. The small size was emphasized because of its compatibility with a launch from a small [deleted] helicopter. The Army HELLFIRE Program involves the development of an entirely new, heavier missile. However, the HELLFIRE guidance package will build upon the technological base established by ARPA.

NATO APPLICATION

Senator THURMOND. What application do these projects have for a military situation like NATO in Europe?

Dr. LUKASIK. Unattended ground sensors could be an important source of intelligence in a European war [deleted].

DEFENSE SPECIAL PROJECTS GROUP TRANSFERS

Senator THURMOND. How many of these projects were picked up directly from the Defense Special Projects Group?

Dr. LUKASIK. The unattended ground sensors project was picked up from the Defense Special Projects Group. As you are aware, most of the hardware and

the devices which have been developed by DSPG have been transferred to the Services. ARPA has taken over from DSPG the exploratory research on several aspects of advanced concepts in unattended ground sensors.

Role of ARPA in Single-Service Work

Senator Thurmond. Dr. Lukasik, in your statement you indicate that the ARPA work is multiservice in nature. Yet the Agency seems to be working on projects which are unique to one of the services such as ocean monitoring and submarine [deleted] detection which apply only to the Navy. Would you explain why these projects would be in ARPA rather than Navy R and D?

Dr. Lukasik. The issue of SLBM forces utility and vulnerability, of which submarine [deleted] detection is a part, is multiservice in nature and is so critical to U.S. strategic and tactical capabilities that every reasonable effort to search for and uncover potential technological advances must be undertaken. The problem of submarine detection is crucial not only to maintaining the viability of our present undersea deterrent but also to assess viable defense options for our strategic bomber forces and command centers and determine the role of planned or projected ABM elements in response to the emerging Soviet SLBM threat. The success in locating Soviet SSBN elements directly impacts the technical requirements for SLBM defense warning and engagement systems which are the responsibility of not only the Navy, but the Air Force and Army as well.

The same can be said for ocean monitoring. Here we worry not only about ship movement but, more importantly, the ability to detect and track ballistic and cruise missiles as well as low flying aircraft approaching from off our coasts. Again the responsibilities for detection, track and warning of these enemy forces cross service responsibilities. The ARPA role in these areas concentrates on uncovering and demonstrating on a limited basis new and novel approaches taking full account of the R&D activities in Service programs.

Determination of Projects for Support

Senator Thurmond. How does ARPA determine what technology concepts are candidates for selection and support as Defense programs?

Dr. Lukasik. It is ARPA's mission to perform advanced research projects as assigned by the Director, Defense Research and Engineering. These assignments relate to Defense problem areas whose solution may depend on the exploitation, or even creation, of several independent technology concepts. By an analysis of military potential and perceived defense needs ARPA identifies those technology concepts requisite to the solution of the assigned problems. ARPA then conducts research and exploratory development programs to evaluate the scientific and technical promise of a concept, and, if appropriate, assures that concepts are developed to the point of Defense utility. Utilization and application of those ideas which ARPA proves feasible is undertaken by one of the military services as I explained previously. The ARPA professional staff has the responsibility of searching out scientific and technological opportunities as well as Defense requirements, so that wise selections can be made.

Coordination With Services

Senator Thurmond. What coordination is made with the affected Service?

Dr. Lukasik. When a program is in the planning stage, ARPA works with representatives of the Service and with ODD&E to establish the utility of the proposed work and to formulate the program so that it will be of maximum benefit to all concerned. When a satisfactory plan of action has been agreed upon, work is undertaken by one or more performing organizations which may be industrial, university, or government laboratories. In all cases, we use an implementing directive, called an ARPA Order, which authorizes the expenditure of funds for specific research tasks. Since ARPA does not have its own contracting facilities, we use agents, generally Service sub-commands, to negotiate and place contracts for us. This procedure gives the Service an opportunity to participate in the monitoring of contract research, which is a second mode of coordination. In some instances the research is actually performed by a Service laboratory and there is an even more direct connection. Finally, the process of transfer is central to the ARPA way of doing business. When ARPA has brought a program to the point at which the feasibility of an idea has been demonstrated or useful technology has been developed, the program is picked

up by the affected service so that the research results are applied as rapidly as possible. This process of transfer of programs at the earliest feasible time works well in practice both from the standpoint of advancing Service programs and enabling ARPA to free resources to respond to new assignments.

Senator THURMOND. Who in the Department of Defense resolves any differences between the service and ARPA on overlapping research programs?

Dr. LUKASIK. The Director of Defense Research and Engineering reviews the programs of the Services and Defense Agencies, resolving such conflicts as may occur. The advanced nature of the ARPA assignments substantially reduces possibilties of overlapping research. Much of the research is in areas where the technology has not yet developed to the point that a determination can be made as to which service application is likely to result.

SELECTION OF MILITARY PERSONNEL

Senator THURMOND. How are the military personnel selected for ARPA? Provide a breakout by service and by rank. Have the current ratios been fairly constant?

Dr. LUKASIK. The usual procedure for selection begins with a request to the Military Personnel Branch, indicating the kind of officer we need in terms of professional background required for the post to be filled. This Branch then searches their files and makes a nomination. We review the nominee's record, and if it seems appropriate we accept him. If we recognize that he is not just right for the job we indicate this and another nomination is submitted. On occasion we request an officer by name when we know of his qualifications and availability. Every effort is made to find the right type of man for the particular job. We have a number of officers, for example, with PhDs in science or engineering who function very effectively.

ARPA has sixty military billets authorized. Forty-six are filled by professionals and fourteen by enlisted support staff as follows:

Grade level and service	Washington	Overseas
O–6:		
USA	2	2
USAF	5	2
O–5:		
USA	2	5
USN	3	2
USAF	5	0
O–4:		
USN	0	2
USA	0	3
USAF	3	2
O–3:		
USA	0	1
USMC	0	1
USAF	2	1
O–2: USAF	0	1
CW–4: USA	0	2
E–8: USAF	0	1
E–7: USAF	0	1
E–6:		
USN	0	1
USAF	2	1
E–5:		
USA	0	6
USAF	1	1
Total	25	35

Since, generally speaking, work in ARPA requires a good deal of technical and managerial sophistication we have always tended more towards the use of rather senior officers. Thus, the number of officers and their distribution by grade shown above, while not fixed, is typical of the situation over the years.

RATIO OF CIVILIANS TO MILITARY PERSONNEL

Senator THURMOND: Do you believe the present civilian-military ratio should be altered in either direction?

Dr. LUKASIK: We feel that the present civilian-military ratio has worked well and it should therefore not be changed. Our military officers are fully equal to our civilians in terms of technical competence and managerial skills. Their military background enables them to interact particularly effectively with their Service counterparts.

SUBCOMMITTEE RECESS

Chairman ELLENDER. The subcommittee will recess until 10 o'clock tomorrow morning.

(Whereupon, at 12 :45 p.m., Tuesday, March 14, the subcommittee was recessed, to reconvene at 10 a.m., Wednesday, March 15.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

THURSDAY, MARCH 16, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

U.S. COURT OF MILITARY APPEALS

STATEMENT OF HON. WILLIAM H. DARDEN, CHIEF JUDGE

ACCOMPANIED BY:
ALFRED C. PROULX, CLERK OF THE COURT
MARK C. SNYDER, CHIEF, BUDGET BRANCH, ODASD (ADMINISTRATION)

BUDGET REQUEST

Chairman ELLENDER. The subcommittee will please come to order.

We have under consideration this morning first the appropriation for the U.S. Court of Military Appeals.

The amount requested for fiscal year 1973 is $914,000 as compared with $869,000 for the fiscal year 1972. The fiscal year 1973 budget request includes $40,000 for the January 1, 1972, pay increases.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

JUSTIFICATION OF ESTIMATES, FISCAL YEAR 1973

Appropriation: U.S. Court of Military Appeals, Defense.

APPROPRIATION INTRODUCTION

[In thousands of dollars]

	Actual fiscal year 1971	Estimate fiscal year 1972	Estimate fiscal year 1973
Appropriation or estimate	817	869	914
Unobligated balance of appropriation	−57		
Total direct obligations	760	869	914

COMMENDATION OF JUDGE DARDEN

Chairman ELLENDER. The principal witness will be Chief Judge William H. Darden.

You may proceed, Judge.

Senator YOUNG. Mr. Chairman, I would like to say something about our witness this morning.

I believe Bill Darden was one of the best staff members the Armed Services Committee ever had, a close friend of one of the greatest Senators of all time, Senator Russell. He is making one of the finest judges we ever had, is an unusually outstanding person, and is one of the best friends I ever had.

Chairman ELLENDER. I agree with that statement. I have known Bill for quite a long time. He was always a faithful servant while he was on the Hill, and I am glad he was, shall I say, promoted. However, I think we would wish you were here, rather than where you are now.

You may proceed, Bill.

Judge DARDEN. Thank you very much, Senator Young, and Mr. Chairman, for those kind words. I am the beneficiary of an enormous amount of good will and tolerance from Members of the Senate and, except for that, I could not have been employed here for the long and happy years I did have.

Off the record.

(Discussion off the record.)

PREPARED STATEMENT

Judge DARDEN. I have a brief prepared statement, Mr. Chairman, that at your pleasure I will either deliver or present for the record.

Chairman ELLENDER. If you will, you can insert it in the record, and highlight it for us.

Judge DARDEN. All right, sir.

(The statement follows:)

Mr. Chairman and Members of the Committee:

I am pleased to have the privilege of appearing before this Committee.

For the next fiscal year the Court proposes no changes in the size of its authorized staff and no increase in amounts appropriated for other objects of expenditure. The fiscal year 1973 request of $914,000 represents an increase of $45,000 over the amount appropriated for the current fiscal year. This increase is attributable wholly to the in-grade salary increases that occur as a staff matures ($5,000), and the pay increases that were legislated for all Federal employees ($40,000).

Members of this Committee will remember that about 95% of the Court's appropriations request is for compensation and personnel benefits. The amounts budgeted for other purposes are relatively small.

The volume of the Court's business continues to be high. Ordinarily one would expect reductions in the number of our forces in Vietnam and in the active duty strengths of our armed forces to result in a decrease in the number of petitions for review submitted to the Court. But the number of petitions the Court considered in the last year was higher than in any year since 1958. Perhaps relative inactivity is the answer, but some evidence suggests that members of the armed forces tend to commit offenses in disproportionate numbers toward the end of a combat tour or when they are nearly ready for release to inactive duty.

After long and honorable service on the Court, Judge Ferguson has entered upon the status of a senior judge. He has been succeeded as an active member of the Court by Judge Robert M. Duncan, formerly a Justice of the Supreme Court of Ohio. Judge Quinn and I pleasantly anticipate his contributions to the Court's functioning.

The judges who served before me established for the Court a reputation for encouraging objective fact-finding by military courts and for extending

the procedural safeguards that are available to members of the armed forces who are accused of offenses. I hope this reputation will continue.

In any event, this Committee and the Congress have consistently supplied the Court the support it needed. We will do our best to try to deserve your continued support.

UNITED STATES COURT OF MILITARY APPEALS

STATUS OF CASES AS OF DECEMBER 31, 1971

TOTAL BY SERVICES

ARTICLE 67(b)(3), UCMJ

PETITIONS		24,890
Army	13,060	
Navy	6,776	
Air Force	4,999	
Coast Guard	55	

ARTICLE 67(b)(2), UCMJ

CERTIFICATES		538
Army	195	
Navy	236	
Air Force	96	
Coast Guard	11	

ARTICLE 67(b)(1), UCMJ

MANDATORY [1/]		37
Army	31	
Navy	3	
Air Force	3	
Coast Guard	0	
TOTAL CASES DOCKETED [2/]		25,465

MISCELLANEOUS DOCKETS
(1967 to Present)

DOCKETED		242
Denied	95	
Dismissed	80	
Withdrawn	3	
Opinions rendered (1 Pet. Recon.)	60	
Petitions for Reconsideration denied	6	
Granted	3	
Issue Moot	2	
Pending	4	3/
TOTAL		(253)

COURT ACTION

PETITIONS		24,890
Denied	21,346	
Denied by Memorandum Opinion	5	
Granted	2,902	
Dismissed	19	
Charges dismissed by Order	2	
Withdrawn	420	
Disposed of on motion to dismiss:		
With opinion	8	
Without opinion	45	
Disposed of by Order setting aside findings and sentence	6	
Remanded (2 by opinion)	191	
Court action due (30 days)	108	4/
Awaiting replies	41	(25,093)
CERTIFICATES		538
Opinions rendered	511	
Withdrawn	8	
Remanded	4	
By Order	1	
Motion to file denied	2	
Opinions pending	1	
Ready for hearing	10	5/
Awaiting briefs	2	(539)
MANDATORY		37
Opinions rendered	37	6/
Remanded	1	(38)
		7/
OPINIONS RENDERED		3,254
Petitions	2,555	
Motions to dismiss (1 Cert; 10 Petitions)	11	
Petitions Remanded	2	
Per curiam grants	57	
Certificates	449	
Certificates and Petitions	59	
Certificates (motion to stay)	1	
Mandatory	37	

COURT ACTION (CONT'D)

Petitions for a New Trial	2	
Petitions in Nature of Writ of Error Coram Nobis	3	
Petition for Writ of Habeas Corpus	1	
Petitions for Reconsideration:		
Of opinion	4	
Of Denial Order	10	
Of Petition for New Trial	1	
Motion to Reopen	1	
Motion for appropriate relief	1	
Miscellaneous Dockets (1 Pet. for Recon.)	60	
COMPLETED CASES		25,246
Petitions Denied	21,346	
Petitions Withdrawn	420	
Petitions Dismissed	19	
Certificates Withdrawn	8	
Certificate by Order	1	
By Opinion (5 Petitions denied)	3,193	
Disposed of on Motion to Dismiss:		
With opinion	8	
Without opinion	45	
Disposed of by Order setting aside findings and sentence	6	
Remanded (4 Certificates and 1 Mandatory)	194	
Writ of Error Coram Nobis by Order	3	
Motion for Bail Denied	1	
Charges dismissed by Order	2	
PENDING COMPLETION		218
Opinions pending	16	
Ready for hearing	41	
Petitions granted - awaiting briefs	10	
Petitions - Court action due 30 days	108	
Petitions - awaiting replies	41	
Certificates - awaiting briefs	2	

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1. 33 cases involving 38 accused sentenced to death; 2 cases involved flag officers; 2 cases filed twice.
2. 24,997 cases actually assigned docket numbers. Overage due to multiple actions on the same cases and some filed twice.
3. Overage due to multiple actions on the same cases.
4. Difference of 203 in total is due to more than one action taken on individual cases.
5. 2 opinions released in Docket 8,176.
6. 2 opinions released in Docket 6,388.
7. 3,254 cases were disposed of by 3,217 published opinions.

PAY RAISES: NONINCREASE OF PERSONNEL

Judge DARDEN. We are proposing no increases in the size of the staff and no increase in the amounts appropriated for other purposes and almost all of the appropriation is for personnel.

Chairman ELLENDER. Except for pay raises.

Judge DARDEN. Yes, but no additional numbers of staff.

AUTHORIZED PERSONNEL AND TEMPORARY EMPLOYMENT

Chairman ELLENDER. What is your authorized staff at present?

Judge DARDEN. The authorization is 44, sir, and we have 37 on-board.

Chairman ELLENDER. You don't need any more?

Judge DARDEN. We occasionally do, but we try to take them on temporarily as we need them. Last year, we had a temporary employee for about 6 months, but we operated at this figure without feeling that we had to go to the maximum, but occasionally we need flexibility.

ABSORPTION OF PAY RAISE

Chairman ELLENDER. How does your account stand now? Do you expect to return anything to the Department of the Treasury because you are not employing these extra personnel?

Judge DARDEN. We will have a little unexpended balance, but less than former years as a result of absorbing the pay increase.

Mr. Synder, from the Office of the Comptroller, Department of Defense, is here.

Mr. SNYDER. Mr. Chairman, the court will absorb a $20,000 pay raise out of the 1972 appropriation.

Chairman ELLENDER. And what do you think the balance is going to be this year, if any?

Mr. SNYDER. It will be very low, over and above that.

Chairman ELLENDER. Is there anything else you want to add?

1972 WORK INCREASE

Judge DARDEN. I think probably the only highlight of the statement is despite reduction in the size of the Armed Forces and bringing back some forces from Vietnam, business has continued high. In the last year the number of petitions has been larger than any year since 1958. This is contrary to what you might expect. But toward the end of a combat tour or toward the end of service commitments, servicemen apparently tend to commit offenses at a slightly higher rate than otherwise.

In years to come, particularly if we are successful in obtaining an all-volunteer force, we hope to see some diminution in infractions of military law and fewer courts-martial.

STATUTORY MANDATE FOR REVIEW WITHIN 30 DAYS

Chairman ELLENDER. Tell me, what is your backlog of cases? Are you well up with your work?

Judge DARDEN. Yes, sir. The law requires that the court act on all petitions for review within 30 days. As a result of the law, we have

to stay current on those petitions. After petitions are granted, we schedule the cases for oral argument within 2 to 3 months, and normally an opinion is issued within 6 weeks of oral argument.

I claim no credit for this, but I think the court has a commendable record of currency as a result of the law and the hard work of my predecessors.

Chairman ELLENDER. Any questions?

1972 PETITIONS: PERCENTAGE OF GRANTS

Senator YOUNG. About how many cases do you handle a year?

Judge DARDEN. Last year we had about 1,200 petitions, Senator Young, from persons who wanted the court to hear their cases. It is impossible for us to grant that many.

Statistically, this works out that we hear about 15 percent of those who submit such petitions, so we have something like 150 to 175 formal opinions in a year.

STATUTORY MANDATE TO GRANT OR DENY PETITIONS WITHIN 30 DAYS

Senator YOUNG. The current position you describe is in great contrast to many other courts, particularly in the District of Columbia.

Judge DARDEN. Thank you, sir. I think a part of that credit at least must go to the wisdom of the Congress in enacting a requirement that the court decide to deny or grant a petition within 30 days. I think that is a wise provision.

Senator YOUNG. I don't think I ever heard criticism of your decisions either, none that came to my attention.

Chairman ELLENDER. I think we should have such laws enacted for other courts, particularly in the District of Columbia.

If you have no further questions, we thank you, gentlemen.

Does anyone else desire to make a statement?

RETIRED SERVICES OF JUDGE FERGUSON

Judge DARDEN. Mr. Chairman one other thing. My statement refers to the long and honorable service of Judge Ferguson, who has entered upon the status of a senior judge and who has been succeeded by Judge Duncan.

Chairman ELLENDER. I often see Judge Ferguson. He is a very fine man.

Judge DARDEN. He is indeed, and we are fortunate in having him continue with us. He is at the court nearly every day. He has chambers there and is available to function in case one of the judges is incapacitated.

Thank you for our cordial reception here.

DEPARTMENT OF DEFENSE

CLAIMS, DEFENSE

STATEMENTS OF:

DON R. BRAZIER, PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

JACK QUETSCH, DIRECTOR OF OPERATIONS

BUDGET REQUEST

Chairman ELLENDER. The next appropriation to be considered is "Claims, Defense."

Mr. BRAZIER. Good morning, Mr. Chairman.

Chairman ELLENDER. How are you, sir?

Mr. BRAZIER. I will brief my statement.

Chairman ELLENDER. Your complete statement will be put in the record, and you can proceed to brief it.

The fiscal year 1973 request is $52.9 million as compared with $39 million provided for fiscal year 1972.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

APPROPRIATION INTRODUCTION

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Appropriation or estimate	$39,000	$39,000	$52,900
Unobligated balance transferred from other accounts	13,000	6,900	
Unobligated balance of appropriation	−393		
Total obligations	51,607	45,900	52,900

This appropriation provides for the payment of all noncontractual claims against the Department of Defense as authorized by law and represents the consolidated requirements of the Secretary of Defense and the Departments of the Army, Navy, and Air Force.

UNCONTROLLED ACCOUNT

Mr. BRAZIER. Very well. I think the significant point in our claims estimate is the fact that this is a very difficult account to make estimates for since it is largely an uncontrollable appropriation; that is to say, that the claims are filed by military personnel and others, and they are adjudicated by properly constituted review authorities, and to the extent that they are adjudicated and determined payable they must legally be paid.

1972 CLAIMS: REPROGRAMING OF FUNDS FROM DEFENSE PRODUCTION GUARANTEES

We are requesting in fiscal year 1972 an increase for claims to be financed by reprograming through a transfer under the provisions of section 736 of the fiscal year 1972 appropriation bill.

This request is for $6.9 million which we proposed to transfer to the claims appropriation from the account "Defense production guarantees" where we have determined we have excess cash available for this purpose.

We also have estimates in 1972 which range from $45 million to $49 million, indicating there is a possibility for a further requirement before the year is over beyond the $6.9 million.

We are not sufficiently certain of that at this time to recommend further financing, but if it should materialize, we would propose to use, the further transfer of approximately $3 million, if it amounts to that much, under provisions of section 736.

Chairman ELLENDER. Are these funds managed by the Comptroller of the Department of Defense—Secretary Moot?

Mr. BRAZIER. Yes, sir; they are administered by our office but made available to the military departments where the claims are adjudicated.

Chairman ELLENDER. Proceed.

1973 INCREASE

Mr. BRAZIER. In fiscal year 1973, we are estimating a requirement for $52.9 million, which is slightly higher than the fiscal year 1972 estimate at this time. The increase is based primarily on the trend and the value of claims which are constantly increasing, and we are hopeful that with the $52.9 million will not have to resort to extra financing in fiscal year 1973.

I think those are the salient points of our estimate, Mr. Chairman. We will be happy to try to answer any further questions.

PERSONAL LOSSES SUSTAINED BY INDIVIDUALS: LIMITATION ON PAYMENTS

Chairman ELLENDER. Generally speaking, what is the basis for most of these claims?

Mr. BRAZIER. Most of them arise as a result of personal claims which are sustained by individuals.

Chairman ELLENDER. I understand that these claims are paid in accordance with the provisions of existing statutes which, in most instances, impose a dollar ceiling.

Mr. BRAZIER. That is correct, Mr. Chairman.

Chairman ELLENDER. The information on pages 4 through 7 of the justifications setting out the maximum limit on claims and the description of the various types of claims will be included in the record at this point.

(The information follows:)

MAXIMUM LIMIT OF ANY ONE CLAIMS

The Department of Defense is limited by law in the maximum amounts that may be paid in settlement of claims under this appropriation as follows:

Personnel claims:	
Military Personnel and Civilian Employees Claims Act of 1964 (31 USC 240)	$10,000
Military Personnel and Civilian Employees Claims Act of 1964 (31 USC 241)	10,000
Correction of military records (10 USC 1552)	1/
Repayment of erroneous collections (no statute)	1/
Tort claims:	
Federal Tort Claims Act (28 USC 2672)	2,500*
Noncombat Activities (10 USC 2733)	15,000
Noncombat Activities (32 USC 715)	15,000
Foreign Claims Act (10 USC 2734)	15,000
Foreign Claims Act (10 USC 2734a)	1/
Foreign international agreements (10 USC 2734b)	1/
Nonscope of employment (10 USC 2736)	1,000
Compromise settlements (28 USC 2677)	1/*
Admiralty claims:	
Admiralty Claims Act (10 USC 7622)	1,000,000
Maritime Claims Act (10 USC 9801)	500,000
Miscellaneous: Post Office (39 USC 712)	1/

1/ No limit.

* The Federal Tort Claims Act amendment, PL 89-506, effective January 18, 1967, made no change in the amount that may be administratively paid by the Department of Defense or Military Department. That amount will remain at $2,500. A lawsuit for damanges caused prior to January 18, 1967 which is subsequently compromised must be paid out of DoD claims funds. However, on claims resulting from damages caused after January 18, 1967, an award, compromise, or settlement may be made in any amount but if such amount exceeds $25,000, it can only be made with the prior written approval of the Attorney General or his designee. Any award, compromise or settlement made in excess of $2,500, or made by the Attorney General in any amount, "shall be paid in a manner similar to judgments and in like causes and appropriations or funds available for the payment of such judgments and compromises are hereby made available for the payment of awards, compromises or settlements under this chapter." Payment of judgments are made by the Treasury Department (28 USC 2414; 31 USC 724a).

Personnel claims include:

1. Payments, under authority of the Military Personnel and Civilian Employees Claims Act of 1964 (31 USC 240 and 241), as amended, of claims of military and civilian personnel for private property lost or damaged in the military services. Also for payment of such types of claims of National Guard personnel pursuant to 32 USC 715.

2. Section 202(8) of the Classification Act of 1949, as amended (5 USC 1082(8)), requires that the compensation of civilian marine employees shall be fixed and adjusted from time to time in accordance with prevailing maritime rates and practices as nearly as is consistent with the public interest. It is the practices of the maritime industry to provide certain benefits to merchant marine personnel for loss of life and loss of damage to personal effect due to war risks (including certain marine risks). In the maritime industry, these benefits are obtained by means of insurance. In accordance with the policy of the Department of the Army of being a self-insurer, the benefits are paid to civilian marine personnel and their beneficiaries directly by the Army. These benefits include (1) the payment up to $10,000 in the event of loss of life directly or proximately caused by war or marine risks; (2) the payment of $500 to licensed officer marine personnel for loss of personal effects; and (3) the payment of $300 to unlicensed crew members for loss of personal effects.

3. Payments, under authority contained in this appropriation, of amounts determined by the Secretary of Defense or officers designated by him, to have been erroneously collected from military or civilian personnel, including amounts previously collected and deposited in the General Fund of the Treasury.

4. Payments under the Legislative Reorganization Act of 1946 (10 USC 1552), as amended by Public Law 220, 82d Congress, for claims arising from the correction of military or naval records.

Tort claims include:

1. Payments, under authority of the Federal Tort Claims Act of 1946 (28 USC 2672), for damage to or loss of property or on account of personal injury or death, where the total amount of the claim does not exceed $2,500, caused by the negligent or wrongful act or omission of any employee of the Department of Defense while acting within the scope of his employment under circumstances where the United States, if a private person, would be liable to the claimant for such claim, in accordance with the laws of the place where the act or omission occurred.

2. Payments, under authority of the Foreign Claims Act of 1942 (10 USC 2734), to inhabitants of and in foreign countries for damage to or loss or destruction of private property or for personal injury or death, not to exceed $15,000, caused by the negligent or wrongful act or omission of employees of the Department of Defense and under authority of NATO Status of Forces (10 USC 2734a), which provided for a reciprocal and more effective remedy in the settlement of certain claims arising out of the acts or omissions of military and civilian personnel of the Armed Forces in the performance of official duty in a foreign country and which authorized the pro rata sharing of the costs of such claims with the foreign countries.

3. Payments, under authority of the Military Claims Act of 1943 (10 USC 2733), and Public Law 87-212 for damage to or loss or destruction of private property, or medical, hospital or burial expenses on account of personal injury or death caused by military or civilian personnel incident to noncombat activities of the Department of Defense.

4. Payments, under authority of the Federal Tort Claims Act of 1946 (28 USC 2677), for claims compromised, arbitrated or settled by the Attorney General.

5. Payments up to $1,000, under authority of the non-scope of Employment Tort Claims Act of 1962 (Public Law 87-789), damage to or loss of privately-owned property where personnel of the Department of Defense are found to be responsible.

Admiralty claims include:

1. Payments by the Department of the Navy, under authority of the Admiralty Claims Act (10 USC 7622), for personal injury or death or property damage caused by vessels of the Navy or in the naval service and for compensation for towage and salvage services rendered to such vessels.

2. Payments by the Departments of the Army and Air Force, under authority of the Maritime Claims Act of 1951 (10 USC 4802-4806 and 10 USC 9801-9806), for claims arising from similar marine accidents and incidents.

Other miscellaneous claims, include:

1. Amounts under authority of the Post Office Claims Act of June 6, 1953 (67 Stat. 55, 39 USC 141-145), for the Departments of the Army, Navy and Air Force to provide for indemnification of the Post Office Department for funds embezzeled or for claims arising from error, loss or defalcation by unbonded mail clerks and commissioned officers.

2. Payments, under authority contained in this appropriation of claims for damage arising under training contracts with contractors, caused by the negligency of military trainees in accordance with the provision of agreements whereby military personnel are trained by contracts for the convenience of the Government.

AVERAGE TIME FOR PROCESSING CLAIM

Chairman ELLENDER. How long does it usually require to service a claim after it is filed with you?

Mr. BRAZIER. That varies depending upon the complexity of the claim. Mr. Quetsch, do we have statistics on the average?

Mr. QUETSCH. Yes, the personnel claims, which constitutes the largest number, takes an average of a year from the time of the incident and part of that is the time to file and the rest is the smaller part, the rest is the processing of the claim and payment.

PROCESSING PROCEDURE

Chairman ELLENDER. How do you go about processing a claim? What kind of proof do you require?

Mr. BRAZIER. The serviceman is required to provide a statement of loss. He would have a permanent change of station travel order that authorizes him to move material into the common claim and he would have an inventory that would be approved at the transportation office of what they actually ship and a statement at the other end certifies what he received and what was lost. So there is evidence at both ends certified by the Government and he would file a claim; and the review board, whether it be at the base or higher echelon, would make the determination as to validity of the claim.

CLAIMANT EVALUATION OF LOSS

Chairman ELLENDER. Is there a value put on the items inventoried for shipment?

Mr. QUETSCH. Not at the time of the shipment, but at the time of the claim. He does not have to estimate everything he ships, but he has to estimate at the filing of the claim.

Chairman ELLENDER. I presume you can judge whether it is overvalued or not.

Mr. BRAZIER. This is one of the responsibilities of the reviewing authorities, to determine what the fair value of the loss is.

CLAIMS OF ADMIRALTY

Chairman ELLENDER. What about admiralty claims? Do you have any of those?

Mr. BRAZIER. Yes, but there are very few of them. Only $450,000 of the 1973 estimate is estimated for that purpose, which is less than 1 percent of our total.

Chairman ELLENDER. How do those claims differ from the ones you usually handle?

Mr. BRAZIER. Well, they are under an Admiralty Claims Act, which is a specific act, that lays down the specific circumstances for payments, and they are payments arising primarily from marine accidents and other incidents of vessels that belong to the U.S. Government that are involved in some type of incident with a civilian vessel.

Chairman ELLENDER. That does not involve individuals?

Mr. BRAZIER. No, sir.

Chairman ELLENDER. Does it involve the Government itself?

Mr. BRAZIER. Well, it could involve an individual in the sense that a Government vessel could run into or have a collision with an individual and he would have a right, then, to file a claim.

Chairman ELLENDER. But the primary function, as I understand it, is to handle claims made by boatowners who claim damages?

Mr. BRAZIER. That is right.

Chairman ELLENDER. That is by virtue of a collision with ships owned by the Federal Government?

Mr. BRAZIER. That is correct, sir.

TYPES OF CLAIMS

Chairman ELLENDER. In looking over the justifications I note that the total request of $52.9 million includes $34 million for personnel claims, $18.4 million for tort claims, $450,000 for admiralty claims, and $50,000 for miscellaneous claims. This is your best estimate based on prior experience.

Mr. BRAZIER. Yes, sir.

Chairman ELLENDER. Any questions?

Senator YOUNG. No questions.

Chairman ELLENDER. Is there anything you want to add on that subject?

Mr. BRAZIER. No.

PREPARED STATEMENT

Chairman ELLENDER. Your statement will be inserted in the record at this point.

(The statement follows:)

I am appearing before your committee today to discuss the estimated fiscal year 1973 requirements for the appropriations, "Claims, Defense." This appropriation provides the necessary funds for the payment, as prescribed by law, of all noncontractual claims against the Department of Defense.

For fiscal year 1971 Congress appropriated $39 million and authorized a $13 million transfer from the Defense Production Guarantees accounts. During fiscal year 1971 we obligated $51.6 million of the $52 million made available to us, the lapse of $.4 million representing less than one percent of our total availability. During fiscal year 1971 we noted: (1) that there was approximately a one-year lapse between the claim incident and the claim obligation; (2) that a major portion of our personnel claims appeared to be related to PCS movements; and (3) that we had been underestimating the average unit cost of our claims. The time lag, between claim incident and claim obligation, resulted almost entirely from the time elapsed between the date of the incident and the filing date of the related claim. We found no evidence indicating that it took longer to adjudicate and pay the claim; to the contrary service to the individual submitting the claim appears to have been improved.

We requested and the Congress appropriated $39 million for fiscal year 1972 for the Claims, Defense Appropriation. Utilizing our fiscal year 1971 experience we are now forecasting a requirement of $48.9 million which is down slightly from the $51.6 million obligated in fiscal year 1971. In order to finance this requirement, as forecasted, we plan to transfer up to $6.9 million from the Defense Production Guarantees Revolving Fund to Claims, Defense. If the additional $3.0 million of Claims materialize, we would plan to recommend a further Section 736 transfer to the Committee to cover any deficiency.

Since our fiscal year 1973 budget estimates were developed several months ago, I though it would be appropriate to give you a brief update on where we stand with regard to our revised estimates for fiscal year 1972.

Reports on the Claims, Defense Appropriation show that through January 1972 we have obligated $25.3 million. Estimates from the services for the balance of fiscal year 1972 and estimates for the last 5 months based on the phasing experienced during the last three years both indicate a total claim requirement for fiscal year 1972 in the $45 million to $49 million range.

For fiscal year 1973 we are requesting $52.9 million. The trend of increasing average cost per claim is expected to continue; partially as a result of inflation, but primarily as a result of increase in living standards, i.e., our claims are apparently involving the loss or damage of more, and more expensive, personal property.

The following table provides a summary of our claims requirements and related financing:

CLAIMS
(In Millions of Dollars)

				Estimate	
	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Carryover from previous yr.	1.1	-	1.8	-	-
Claims adjudicated during the year	36.4	40.2	49.8	48.9	52.9
Total Claims	37.5	40.2	51.6	48.9	52.9
Lapsed	.5	.6	.4	-	-
Financing:					
Appropriation (Initial)	38.0	39.0	52.0	45.9	52.9
Transferred	(38.0)	(39.0)	(39.0)	(39.0)	(52.9)
Transfer Requested	-	-	(13.0)	-	-
Adjudicated claims carried over into subsequent year	-	-	-	(6.9)	-
Possible Additional Request	-	1.8	-	-	-
	-	-	-	3.0	-

The various types of claims for which provision has been made in this appropriation request are grouped into four major categories; namely, personnel claims, tort claims, admiralty claims and other miscellaneous claims.

PERSONNEL CLAIMS

The personnel claims category which accounts for 64.3 percent of the appropriation request for fiscal year 1973 includes (1) claims of military and civilian personnel for private property lost or damaged in the military services, (2) repayments of erroneous collections, and (3) claims arising from the correction of military or naval records. It is estimated that the general category of personnel claims will require approximately $34.0 million in fiscal year 1973.

TORT CLAIMS

The tort claims category which accounts for 34.8 percent of the appropriation request for fiscal year 1973 includes (1) cases arising under the Federal Tort Claims Act, (2) foreign claims against the services under the act of October 9, 1962. Approximately $18.4 million is expected to be required for claims of these types during fiscal year 1973.

ADMIRALTY CLAIMS

Admiralty claims which account for .9 percent or almost the balance of the appropriation request for fiscal year 1973 include payment under authority of the Admiralty Claims Act and Maritime Claims Act for claims arising from marine accidents and incidents involving vessels of the military departments. Admiralty claims are expected to require $450,000 in fiscal year 1973.

OTHER MISCELLANEOUS CLAIMS

The other miscellaneous claims category account for only one tenth of one percent of the appropriation request for fiscal year 1973 and includes (1) amounts for the indemnification of the Post Office Department for funds embezzled or for claims arising from error, loss due to defalcation of unbonded mail clerks and commissioned officers, and (2) claims for damage due to accidents arising under training contracts with contractors caused by the negligence of military trainees. It is estimated that $50,000 will provide for such miscellaneous claims in fiscal year 1973.

In summary, the appropriation request of $52.9 million for fiscal year 1973 represents in our judgment a reasonable estimate of the requirements for all types of noncontractual claims against the Department of Defense.

All payments made from this appropriation are authorized by various statutes governing the settlement of claims. No provision is made for any of the administrative or personnel costs required to process the claims under this appropriation.

CONTINGENCIES, DEFENSE

STATEMENT OF DON R. BRAZIER, DEPUTY ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

ACCOMPANIED BY CALVIN M. VOS, OFFICE OF ASSISTANT GENERAL COUNSEL (FISCAL MATTERS), OFFICE OF THE SECRETARY OF DEFENSE

BUDGET REQUEST

Chairman ELLENDER. The next appropriation is "Contingencies, Defense," for which the fiscal year 1973 request is $5 million, the same amount as was provided for fiscal year 1972.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE—MILITARY CONTINGENCIES, DEFENSE—PROGRAM AND FINANCING

[In thousands of dollars]

	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Emergency and extraordinary expenses (obligations) (object class 91.0)	297	5,000	5,000
Financing:			
Unobligated balance lapsing	4,703		
Budget authority (appropriation)	5,000	5,000	5,000

CERTIFICATION BY SECRETARY OF DEFENSE THAT EXPENDITURES ARE REQUIRED FOR CONFIDENTIAL MILITARY PURPOSE

Chairman ELLENDER. The principal witness will also be Mr. Brazier. You may proceed.

Mr. BRAZIER. I have a short statement which I will provide for the record, and just indicate that this account is exactly what it is stated to be, a contingency account, which means we have no program to back up the estimate. We cannot tell you at this time what the money would be used for.

There is a requirement with respect to this money, however, that each use must be certified by the Secretary of Defense as being required for a confidential military purpose and that the moneys cannot be used without that specific certification.

Chairman ELLENDER. As I recall, under the terms of the appropriation language the Secretary of Defense is the only person who can authorize the use of these funds.

Mr. BRAZIER. Yes, sir. He or the Deputy Secretary of Defense are the only ones that can authorize the use of these.

Chairman ELLENDER. Can you give us a few examples of such claims?

Mr. BRAZIER. This year we had only one and it is for $25,000 [deleted] and is considered of a very confidential nature.

Chairman ELLENDER. I presume that the unobligated balance of this appropriation on June 30 lapses, that is it is not available for obligation after the end of the fiscal year for which appropriated.

Mr. BRAZIER. That is correct, Mr. Chairman. This is an annual appropriation.

Chairman ELLENDER. It goes back to the Treasury?

Mr. BRAZIER. Yes, it does.

Chairman ELLENDER. The only obligation to this point would be the $25,000 you speak of?

Mr. BRAZIER. Yes, sir.

Chairman ELLENDER. The information on pages 4 and 5 pertaining to the request of $5 million for contingencies will be included in the record at this point.

(The information follows:)

JUSTIFICATION OF ESTIMATES

INTRODUCTORY STATEMENT

[In thousands of dollars]

	1971 actual	Fiscal year— 1972 estimate	1973 estimate
Appropriation estimate	$5,000	$5,000	$5,000
Unobligated balance of appropriation	4,703		
Total direct obligations	297	5,000	5,000

This appropriation provides the Secretary of Defense with funds to meet emergencies and extraordinary expenses arising in connection with the national security and for such other purposes as he deems proper.

The funds in this appropriation are required by the Secretary of Defense to finance unforeseeable emergency and extraordinary expenses for confidential military purposes. Such funds are expended on the approval or authority of the Secretary of Defense and may be accounted for solely on his certificate that the expenditures are necessary for confidential military purposes. Because of the very nature of this appropriation, there is no program underlying the estimates. It is believed that the $5,000,000 level should be available to the Secretary of Defense to finance unforeseeable emergencies and extraordinary expenses for confidential military purposes when the need materializes. If the funds are not required as of June 30, the unobligated balance automatically reverts to the U.S. Treasury.

The Secretary of Defense or the Deputy Secretary of Defense personally reviews each project proposed for financing by this appropriation. Their approval of the use of these funds must be expressed by written memoranda which limit the maximum amount of obligations that may be incurred for the purposes stated. This practice limits the use of these funds to only those specific projects which, in the Secretary's judgment, should be financed in this manner.

Chairman ELLENDER. Anything else you want to add?

Mr. BRAZIER. Nothing else.

Chairman ELLENDER. Senator Young?

Senator YOUNG. No questions.

PREPARED STATEMENT

Chairman ELLENDER. Your prepared statement will be inserted in the record at this point.

(The statement follows:)

I appreciate the opportunity to meet with the Committee, and to discuss our request for funds under the Contingencies, Defense Appropriation for FY 1973.

The estimates for the appropriation "Contingencies, Defense" total $5 million for FY 1973.

These funds are required to meet unforeseeable emergencies and extraordinary expenses arising in the Department of Defense. Such funds are expended on the approval or authority of the Secretary of Defense, and may be accounted for solely on his certificate that the expenditures were necessary for confidential military purposes.

This appropriation provides the Secretary of Defense with funds to meet unforeseeable emergencies and extraordinary expenses for which provision cannot be anticipated in advance and which require expeditious handling. Under these circumstances, this appropriation serves as a ready reserve for use as determined by the Secretary of Defense for emergency type situations as they occur. These are the only contingency funds available to the Department of Defense which the Secretary may use on a timely basis to finance unplanned programs requiring discreet and immediate action by him. If these types of requirement could be determined in advance, provision for their support would be made in the regular appropriations.

We have implemented strict controls over the use of funds made available under the Contingencies, Defense Appropriation. Each individual project proposed for financing with these funds is reviewed by the Secretary of Defense. If financing of the proposed projects from other appropriations is appropriate, the use of contingency funds is not authorized. For each specific project approved by the Secretary for financing with Contingencies, Defense funds, a dollar ceiling is established, and this ceiling cannot be exceeded for that project.

In consideration of the fact that the Contingencies, Defense Appropriation provides the only timely source of funds which the Secretary has to meet unprogramed urgent requirements of a confidential, emergency, and extraordinary nature, approval of the $5 million for FY 1973 is considered essential.

Special Foreign Currency Program

STATEMENT OF DON R. BRAZIER, PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

ACCOMPANIED BY:

WILLIAM H. T. GLENN, DEPUTY DIRECTOR FOR PLANS AND SYSTEMS, OFFICE OF ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

AARON J. COHEN, HEAD, FOREIGN FINANCIAL AFFAIRS BRANCH, OFFICE OF THE COMPTROLLER OF THE NAVY

DR. J. P. POLLARD, DIRECTOR, BIOLOGICAL AND MEDICAL SCIENCES DIVISION, OFFICE OF NAVAL RESEARCH

BUDGET REQUEST

Chairman Ellender. The next appropriation to be considered is the special foreign currency program for which the fiscal year 1973 request is $3.4 million as compared with $12 million for fiscal year 1972.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

PROGRAM AND FINANCING

[In thousands of dollars]

	Budget plan (amounts for foreign currency undertakings programed)			Obligations		
	1971 actual	1972 estimate	1973 estimate	1971 actual	1972 estimate	1973 estimate
Program by activities:						
1. Operation and maintenance		4,161		1,937	1,600	2,400
2. Purchase of goods and equipment		1,395	400	4	500	1,700
3. Research	2,853	2,605	3,000	1,070	1,300	6,600
4. Construction	5,035	3,839		208	8,600	1,300
Total	7,888	12,000	3,400	3,219	12,000	12,000
Financing:						
Unobligated balance available, start of year:						
For completion of prior year budget plans				−8,134	−12,803	−12,803
Available to finance new budget plans	−5,267			−5,267		
Unobligated balance available, end of year for completion of prior year budget plans				12,803	12,803	4,203
Budget authority (appropriation)	2,621	12,000	3,400	2,621	12,000	3,400

Chairman Ellender. Mr. Brazier will also speak to this appropriation.

PREPARED STATEMENT

Mr. Brazier. If I may provide the statement for the records, sir, I will run over the essential elements of our request for this fiscal year.

(The statement follows:)

It is my privilege to present this statement on the Department of Defense Special Foreign Currency Program. As you know, this program was established for Government agencies to promote the use of excess foreign currencies which are available for U.S. use. Under the language of this appropriation, the dollars appropriated may be used only to purchase from the Treasury currencies needed to finance undertakings which can be carried out with these excess currencies.

There are two principal points in connection with this appropriation which distinguish it from all other Defense appropriation requests:

1. First, the currencies spent under this program are already owned by the U.S. Treasury. Consequently, there are no net U.S. Government dollar outlays for transactions carried out under the program. While budget authority shows up as a part of DoD budget authority and obligations and outlays, there is no net outlay from the U.S. Treasury.

2. Second, the undertakings which we propose for financing under this program are of such priority that they would not be included in the regular dollar appropriation requests. Nevertheless, our regulations require that projects must be clearly in the national interest; they must not involve excessive dollar costs and only minimal balance of payments outlays; and the projects cannot cover items which have been specifically denied by Congress in other appropriation or authorization requests or be above levels beyond specific Congressional recommendations. For research, the criteria also limits undertakings to those which take advantage of (a) special geographical, environmental or cultural conditions, fauna or flora; (b) diseases, epidemiological situations, or availability of clinical material; or (c) unique research ideas highly relevant to the Department of Defense.

In addition, it is required that each DoD component obtain clearance from the State Department to assure that the proposed undertakings are consistent with the foreign policy of the United States.

Our budget request is made up of undertakings that have been proposed by the Military Departments. These proposals are reviewed during the course of the annual budget review to assure their adherence to the criteria for this program. They are then consolidated into a single appropriation request for inclusion in the President's Budget.

Let me point out that the opportunities for the Department of Defense to use this program are quite limited. The countries whose currencies are on the excess list are not countries in which there is a significant defense involvement.

The total request for FY 1973 is for $3.4 million of which $0.4 million is for purchase of goods and equipment and $3.0 million is for research.

The $0.4 million for purchase of goods and equipment is to finance the 20% Yugoslavia currency part of an Army project to purchase furniture for family housing in Europe.

The research portion is all for medical research projects. The larger share of this program, $1.9 million, is to support the research activities being conducted by the Naval Medical Research Unit Number 3 in Egypt. For several years we have been augmenting the funding for this research unit with funds from this appropriation. This has enabled them to conduct research related to the many diseases that occur in Africa and the Middle East and that are not endemic to the United States. The request this year is a continuation of the same plan. A major objective of this year's program will involve research on one of the most debilitating diseases in this part of the world, namely Schistosomiasis, a parasitic infestation which affects the bladder and lower intestinal tract.

The remainder of the program is for medical research projects to be carried out in India, Pakistan, and Yugoslavia. Five of these projects involve research in the various aspects of physiological stress. For example, in India, it is possible to take advantage of the climatic conditions prevailing in that area to study acclimatization, debilitation, and fatigue, and biomedical diving problems. In Yugoslavia, it is possible to take advantage of special techniques and devices which they have developed in studying abnormal breathing and work fatigue. A total $0.5 million is included for these five projects in these two countries. Also included for Yugoslavia and Pakistan are two projects totalling $0.6 million which will cover studies in diseases endemic to these areas. We consider that all of the projects selected for this program are in the areas where the research efforts will be responsive to the needs of the Defense medical program. Moreover, we consider that these are projects which are appropriate to conduct in these excess foreign currency countries.

This completes my statement. I will attempt to answer any questions the Committee may have concerning this program.

PURCHASE OF EXCESS FOREIGN CURRENCIES FROM TREASURY DEPARTMENT: DEPARTMENT OF STATE APPROVAL OF PROGRAMS

Mr. BRAZIER. This appropriation, sir, is entirely for the purchase of excess foreign currencies from the Treasury Department, such currencies being currently owned by the U.S. Government and generated primarily through transactions, under Public Law 480, the Agricultural Trade Development and Assistance Act.

The currencies are used by the Department of Defense only after approval of the programs by the Department of State. This to insure that the purpose of the undertakings are consistent with the foreign policies of the United States. In the Department of Defense programs are considered important but not of sufficient priority to be included within our regular appropriations.

Our capability of using these funds is becoming more and more limited as these currencies are being drawn down and our requirements in the excess currency countries are relatively small.

1972 PROGRAM

Chairman ELLENDER. You were provided $12 million for fiscal year 1972?

Mr. BRAZIER. Yes, sir.

Chairman ELLENDER. How much was unobligated from last year's appropriation?

Mr. BRAZIER. We expect to use all of the $12 million, sir. All of this amount has not been obligated as of this date, but it is currently programed for use.

MOROCCO PROGRAM

Chairman ELLENDER. Why is it that the amount you are asking now is so much less than your needs last year?

Mr. BRAZIER. There are two reasons. Last year we had some significant one-time projects in Morocco, involving construction, repair, and maintenance, and equipment procurement. Second, the availability of excess currency in Morocco has now been exhausted or will be in fiscal year 1973.

UTILIZATION OF YUGOSLAVIAN CURRENCY FOR PURCHASE OF FURNITURE FOR MILITARY QUARTERS IN GERMANY

Therefore, our request for this year is limited to those areas where we have a current requirement, and cover two primary areas, both of which, by the way, are continuing areas having been in prior year programs. The first is the purchase of furniture from Yugoslavia for use in military quarters in Germany, which will require $400,000 of the $3.4 million.

Chairman ELLENDER. Who is the beneficiary of this?

Mr. BRAZIER. The U.S. Government is, sir, in the sense that we own the Yugoslavian currency and to the extent that we can use that currency to obtain supplies in Yugoslavia that are needed by the U.S. forces.

Chairman ELLENDER. This is simply authority to use currencies wherever they may be generated belonging to the Treasury that you propose to use?

Mr. BRAZIER. That is correct, sir.

Chairman ELLENDER. Senator Young?

Senator YOUNG. In reference to buying furniture for our forces in Europe in Yugoslavia, I think is a very good use of these funds. We don't seem able to find much use for such currencies in many countries around the world.

YUGOSLAVIAN CURRENCY AVAILABILITY

Do you happen to know how much of the Yugoslavian currency we still hold?

Mr. BRAZIER. I think we have that.

Mr. GLENN. The balance available as of June 30, 1971, for Yugoslavia was $52.5 million.

Senator YOUNG. That is the equivalent in dollars?

Mr. GLENN. Yes.

UTILIZING OTHER COUNTRY CURRENCY AVAILABILITY

Senator YOUNG. What other currencies are you using?

Mr. GLENN. I could read the statement.

Senator YOUNG. Read a few.

Mr. GLENN. Burma, Guinea, India, Israel. Israeli pounds are no longer available. That is, no new obligations are permitted.

Chairman ELLENDER. Give the amounts.

Mr. GLENN. Yes, sir. Burma was $11.6 million and Guinea was $5.4 million.

Senator YOUNG. What do you use the money for in Burma?

Mr. GLENN. Defense has not used Burmese currency in this program.

Mr. BRAZIER. We have no military requirements in Burma.

Chairman ELLENDER. But could you use the Burmese money, let's say, to buy anything in Burma that may be of use to the Defense Department?

Mr. BRAZIER. We know of nothing that we can use Burmese currency at this time, Mr. Chairman. We have investigated all excess currencies with respect to the capabilities of the Defense Department to use them.

Senator YOUNG. I was really more interested in this. What do you use the Indian, Pakistan, and Egyptian currencies for?

Mr. BRAZIER. Primarily for research and development projects, sir.

Senator YOUNG. In Egypt, is that right? They are restoring some old historic sites. That does not come under your jurisdiction?

Mr. BRAZIER. No, sir; that is not our purpose.

INDIAN CURRENCIES

Senator YOUNG. What does the Defense Department use these currencies for?

Mr. BRAZIER. The biggest amount in India is the research and development program for physiological stress and biomedical problems. Indian scientists are eminent in this field and the Government of India is receptive to Defense Department sponsorship of such medical programs. The results of this research are important to our medical programs.

Senator YOUNG. What about Egypt?

EGYPTIAN CURRENCIES

Mr. BRAZIER. In Egypt, there is a project concerning research and development on international diseases. These are diseases that are endemic in the Middle East area and which we do not experience in the United States. However, U.S. forces can be subjected to these diseases when they are stationed in those areas.

Senator YOUNG. That is all the questions I have.

OTHER AGENCY PARTICIPATION IN SPECIAL FOREIGN CURRENCY PROGRAM

Chairman ELLENDER. In order to establish a use for this, there must be a need from the Defense Department?

Mr. BRAZIER. That is correct, sir.

Chairman ELLENDER. That does not apply to any other department of Government?

Mr. BRAZIER. Other U.S. Government agencies participate in the special foreign currency program.

Chairman ELLENDER. For instance, in India, if you needed furniture or any goods that are produced there, to use at some Defense Establishment, that fact would entitle you to use those currencies?

Mr. BRAZIER. Yes, sir.

Chairman ELLENDER. If the Defense Department desires?

Mr. BRAZIER. Yes, sir; subject to approval of the Defense Department and with State Department concurrence from a foreign policy viewpoint.

Chairman ELLENDER. In other words, the moneys must be spent in the country that has the currencies available?

Mr. BRAZIER. Yes, sir.

PURCHASE OF FURNITURE FROM YUGOSLAVIA

Chairman ELLENDER. In Yugoslavia, you are going to use the currencies we now hold there to purchase furniture that is made in Yugoslavia and being shipped to Germany for our use?

Mr. BRAZIER. That is correct, Mr. Chairman.

Chairman ELLENDER. Do you know what use is made of the furniture you are seeking?

Mr. BRAZIER. It will be used in military quarters in Germany.

Chairman ELLENDER. In baracks?

Mr. BRAZIER. Some in barracks and some in family housing.

Chairman ELLENDER. Germany is now in the process of improving some of these barracks, I presume that it is in connection with that work that this furniture will be used.

Mr. BRAZIER. There may be an association, Mr. Chairman, but it is not directly related to that. This is a program that we have had underway for several years. The German moneys that are being made available for barracks rehabilitation are not available for the purpose of equipment and furniture.

Chairman ELLENDER. But, I say, it is the result of these barracks being renewed?

Mr. BRAZIER. Yes, that would generate a requirement for furniture.

FISCAL 1973 PLANNED PROGRAM

Chairman ELLENDER. The information on pages 7, 8, and 9 of the justifications pertaining to this request will be included in the record at this point.

(The information follows:)

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SUMMARY OF UNDERTAKINGS IN FY 1973 PROGRAM
(in thousands of dollars and thousands of foreign currency units a/)

	INDIA		PAKISTAN		EGYPT		YUGOSLAVIA		Total
	Dollars	Rupees	Dollars	Rupees	Dollars	Pounds	Dollars	Dinars	Dollars
Purchase of goods and equipment:									
Furniture for family housing Army							400	6,800	400
Total purchase of goods and equipment							400	6,800	400
Research:									
Navy Research Program (India Rupees):									
Physiological stress - Acclimatization	59	429							59
Physiological stress - debilitation and fatigue	123	895							123
Physiological stress - biomedical problems	147	1,070							147
Navy Research Program (Pakistan Rupees):									
International diseases			258	1,229					258
Navy Research Program (Egyptian Pounds):									
International diseases					1,898	1,055			1,898
Navy Research Program (Yugoslavia Dinars):									
International diseases							355	6,035	355
Physiological stress - abnormal breathing							80	1,360	80
Physiological stress - work fatigue							80	1,360	80
Total Research	329	2,395	258	1,229	1,898	1,055	515	8,755	3,000
Total FY 1973 Program	329	2,395	258	1,229	1,898	1,055	915	15,555	3,400

a/ Foreign currency units are computed on basis of "Treasury Reporting Rates of Exchange" as of December 31, 1971.

PURCHASE OF GOODS AND EQUIPMENT

Furniture for family housing - Army (Yugoslavia dinars) $400,000

This undertaking covers the foreign currency portion of an Army proposal to buy furniture from Yugoslavia sources using part Yugoslavia dinars purchased from Treasury with Special Foreign Currency Program funds and part dollars from the Family Housing, Defense appropriation. This technique of combining excess currencies and dollars is considered appropriate in view of the P.L. 480 agreements which permit the foreign government to refuse to accept payment with 100% of their own currencies in cases where the undertaking is for the export of merchandise from the country. The furniture is needed to replace badly worn furniture in family quarters of Army personnel in West Germany. The items to be procured under this proposal are principally wood items, including bedsteads, book cases, buffets, dining chairs, china cabinets, kitchen cabinets, desks, mirrors, servers, dining tables and wardrobes.

Total Purchase of Goods and Equipment $400,000

RESEARCH

Navy Research Program (India Rupees)

Physiological Stress - Acclimatization $59,000

This undertaking will deal with subjects who are transported into a hot, humid environment from a temporate region as is often the case with Naval personnel. The research will involve different ethnic groups who will serve as a source of comparative data to determine if there are any ethnic and/or cultural aspects affecting acclimatization processes.

Physiological Stress - Debilitation and Fatigue $123,000

Military personnel are often forced to undergo the double privation of environmental stress and reduced food intake (e.g., shipwreck, prisoners of war, etc.) resulting in a greatly reduced performance capability. This undertaking proposes that the investigators follow various physiological processes and psychomotor performance in a number of patients who are being restored to health after suffering from malnutrition.

Physiological Stress - Biomedical Diving Problems $147,000

This undertaking proposes that indigenous divers be screened during their annual physical examinations for (a) electroencephalographic changes and (b) development of aseptic bone necrosis. Correlations, if any, between such changes and the various parameters related to diving profiles would be developed by statistical analysis.

Navy Research Program (Pakistan Rupees)

Diseases of International Importance $258,000

The proposed research would attempt to determine the epidemiology, etiologic agents, reservoirs, vectors, and mode of transmission and develop adequate protective and treatment methods for diseases endemic to this area.

Navy Research Program (Egyptian Pounds)

Diseases of International Importance in the Middle East $1,898,000

There are many diseases that occur in Africa and the Middle East that are not endemic to the U.S. and, therefore, when U.S. military personnel are assigned to this geographic area, they are exposed to these diseases to which they have little or no immunity. One of the most debilitating diseases in this area of the world (as well as in Asia and South America), namely Schistosomiasis, will be stressed in the course of this research although other diseases will also be studied.

Navy Research Program (Yugoslav Dinars)

Diseases of International Importance $355,000

It is proposed that selected investigators expand upon the knowledge of the more serious endemic diseases and attempt to develop new and improved prophylactic and treatment methods.

Physiological Stress - Abnormal Breathing $80,000

The basic physiological mechanism underlying such deleterious effects of high pressure (e.g., underwater) environments such as oxygen convulsions, inert gas narcoses, helium tremors, hypoxia and hypercapnia are not fully understood. This investigation, using a special technique and device developed by a Yugoslav scientist called a Magnetic Cartesian Diver on metabolic or other physiological changes in cells related to inert gas narcosis, oxygen convulsions, helium tremors and hypoxia would be very valuable in understanding how to cope with these problems in man.

Physiological Stress - Work Fatigue $80,000

This research will deal with the effect of varying a number of different physical parameters that act as cues to physiological functions. Such problems become very important in such isolated naval environments as submarines, polar regions and underwater habitations. A unique work/living simulator would be employed which exists only in Sarajevo.

Total Research $3,000,000

PRIOR UTILIZATION AND AVAILABILITY OF FUNDS

Chairman ELLENDER. I wish you would provide for the record the use of these funds in past years as well as the amount of such funds available at the present time by country.

Mr. BRAZIER. Very well, sir.

Chairman ELLENDER. It may be that some use for these currencies can be developed.

(The information follows:)

Since inception of the Special Foreign Currency Program in fiscal year 1967, there have been expenditures of excess Yugoslavian currencies for furniture and furnishings amounting to $1.6 million by Department of Army and $0.1 million by Defense Intelligence Agency.

DOLLAR VALUE OF EXCESS FOREIGN CURRENCIES AVAILABLE FOR U.S. USE AS OF JUNE 30, 1971

[In millions of dollars]

Burma	11.6
Guinea	5.4
India	788.7
Israel	4.1
Morocco	12.0
Pakistan	224.9
Poland	384.9
Tunisia	15.2
Egypt	212.0
Yugoslavia	52.5

REQUIREMENT FOR ANNUAL AUTHORIZATION

Senator YOUNG. I note in the tabulation on page 4 of the justifications that $3 million of the request of $3.4 million is for various research projects. Does this $3 million require annual authorization pursuant to section 412?

Mr. BRAIZER. Yes, it does. This is a part of the total authorization for R.D.T. & E., Navy.

Chairman ELLENDER. Any further questions on the foreign currency program?

Senator YOUNG. No.

Chairman ELLENDER. You desire to add anything, Mr. Brazier?

Mr. BRAIZER. No. I think we have covered the item, Mr. Chairman.

Operation and Maintenance, Defense Agencies

Budget Activity, Project Office of the Secretary of Defense

STATEMENT OF DAVID O. COOKE, DEPUTY ASSISTANT SECRETARY OF DEFENSE (ADMINISTRATION)

ACCOMPANIED BY:

CARL W. FISHER, DIRECTOR, BUDGET AND FINANCE DIVISION, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (ADMINISTRATION)

MARK C. SNYDER, CHIEF, BUDGET BRANCH, BUDGET AND FINANCE DIVISION, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (ADMINISTRATION)

ORGANIZATION OF THE JOINT CHIEFS OF STAFF

RALPH G. NESTOR, CHIEF, FINANCIAL MANAGEMENT BRANCH, DIRECTORATE OF ADMINISTRATIVE SERVICES, ORGANIZATION OF THE JOINT CHIEFS OF STAFF

U.S. ARMED FORCES INSTITUTE

DR. NATHAN BRODSKY, DIRECTOR, EDUCATION PROGRAMS AND MANAGEMENT TRAINING, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (EDUCATION)

OFFICE OF INFORMATION FOR THE ARMED FORCES

JOHN C. BROGER, DIRECTOR, OFFICE OF INFORMATION FOR THE ARMED FORCES, OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE (MANPOWER AND RESERVE AFFAIRS)

BUDGET REQUESTS

Chairman Ellender. The next appropriation the subcommittee will consider will be certain budget activities contained in appropriations for "Operation and maintenance, Defense Agencies."

These are for the Office of the Secretary of Defense, $43,700,000.

For the Organization of the Joint Chiefs of Staff, $8,418,000.

For the education program, $6,486,000; and the Office of Information for the Armed Forces, $9,703,000.

PROGRAM AND FINANCE: "OPERATION AND MAINTENANCE, DEFENSE AGENCIES"

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

Program and Financing (in thousands of dollars)

07-10-0100-0-1-051	1971 actual	1972 estimate	1973 estimate
Program by activities:			
Direct program:			
2. General purpose forces	1,599	1,228	.....
3. Intelligence and communications	411,019	440,264	468,649
7. Central supply and maintenance	663,403	665,072	695,954
8. Trainings, medical, and other general personnel activities	11,684	14,265	16,189
9. Administration and associated activities	103,518	106,363	110,309
Total direct program	1,191,223	1,227,192	1,291,101
Reimbursable (Total)	48,232	46,098	42,499
10 Total obligations	1,239,455	1,273,290	1,333,600
Financing:			
Receipts and reimbursements from:			
11 Federal funds	-38,421	-36,546	-33,794
14 Non-Federal sources 1/	-9,811	-9,552	-8,705
25 Unobligated balance lapsing	7,422	.....	.....
Budget authority	1,198,645	1,227,192	1,291,101

Program and Financing (in thousands of dollars)

07-10-0100-0-1-51		1971 actual	1972 estimate	1973 estimate
	Budget authority:			
40	Appropriation	1,203,207	1,202,465	1,242,307
41	Transferred to other accounts	-4,562	-180	.....
43	Appropriation (adjusted)	1,198,645	1,202,285	1,242,307
44.10	Proposed supplemental for wage-board increases	.....	1,200	.....
44.95	January 1972 Pay increase supplemental/amendment	.....	23,707	48,794

PROGRAM AND FINANCING: "PROCUREMENT, DEFENSE AGENCIES"

Chairman ELLENDER. There is also an appropriation for "Procurement, defense agencies," consisting of procurement requests for a number of defense agencies. This seems to be an appropriate place to insert pertinent information including "Program and Financing" and the "Summary of Requirements" in the record, although Mr. Cooke will not address himself to these matters.

(The information follows:)

PROGRAM AND FINANCING

[In thousands of dollars]

	Budget plan (amounts for procurement actions programed)			Obligations		
	1971 actual	1972 estimate	1973 estimate	1971 actual	1972 estimate	1973 estimate
Program by activities:						
Direct: Major equipment	40,007	55,260	69,730	49,775	58,491	64,228
Reimbursable (total)	13,829	9,554	10,636	13,462	10,788	10,636
Total	53,836	64,814	80,366	63,237	69,279	74,864
Financing:						
Receipts and reimbursements from: Federal funds	−13,829	−9,554	−10,636	−13,607	−8,741	−10,636
Unobligated balance available, start of year:						
For completion of prior year budget plans				−37,769	−23,803	−17,913
Available to finance new budget plans	−1,142	−4,388	−2,711	−1,142	−4,388	−2,711
Reprograming from (−) or to prior year budget plans	−4,343	−612				
Unobligated balance transferred from other accounts		−5,000				
Unobligated balance transferred to other accounts		5,000			5,000	
Unobligated balance available, end of year:						
For completion of prior year budget plans				23,803	17,913	23,415
Available to finance subsequent year budget plans	4,388	2,711	2,711	4,388	2,711	2,711
Budget Authority: Appropriation	38,910	52,971	69,730	38,910	52,971	69,730

SUMMARY OF REQUIREMENTS

[In thousands of dollars]

	1971 actual	1972 estimate	1973 estimate
Defense Nuclear Agency		[Deleted]	
Defense Communications Agency	$5,715	$5,661	$13,235
Defense Intelligence Agency		[Deleted]	
Defense Supply Agency	1,718	8,839	8,392
National Security Agency		[Deleted]	
Office of the Secretary of Defense	199	232	243
Total direct program	40,007	55,260	69,730

INTRODUCTION OF ASSOCIATES

Chairman ELLENDER. The principal witness is Mr. David O. Cooke, Deputy Assistant Secretary of Defense for Administration.

It is good to see you, sir.

Mr. COOKE. Thank you, Mr. Chairman. I would like to briefly introduce some of the people I have with me.

I have from my own Budget and Finance Division, Carl W. Fisher, Director; and Mr. Mark Snyder, Chief of the Budget Branch.

I have representing the Organization of the Joint Chiefs of Staff, Mr. Ralph Nestor, Chief, Financial Management Branch.

And the U.S. Armed Forces Institute, Dr. Nathan Brodsky, Acting Deputy Assistant Secretary for Education.

And I am sure you know Mr. John Broger, Director of the Office of Information for the Armed Forces.

Chairman ELLENDER. I have seen his face many times.

PRESENTATION FORMAT

Mr. COOKE. I have a short statement, and I would be glad to read it, or insert it in the record and summarize the high points for you.

Chairman ELLENDER. I think this covers quite a few programs. The committee would appreciate a description of the various areas you represent. Have you a sequence in which you want to take up the various appropriations?

Mr. COOKE. Mr. Chairman, I will first cover as my schedule indicates the Office of the Secretary of Defense, to be followed by the Organization of the Joint Chiefs of Staff, to be followed by the U.S. Armed Forces Institute, and finally, the Armed Forces information program.

Chairman ELLENDER. As you go along, I will ask for the number of people involved in each appropriation.

Proceed.

Mr. COOKE. You want me to read my statement?

Chairman ELLENDER. Yes.

APPROPRIATION COMPONENTS

Mr. COOKE. My presentation today will cover the budget requirements of the Office of the Secretary of Defense, the Organization of the Joint Chiefs of Staff, education programs and the Office of Information for the Armed Forces. Other activities included in the operation and maintenance, defense agencies appropriation, have already made or will make individual presentations to you.

Pay, allowances, and permanent change of station costs for military personnel assigned to the activities under discussion are not included in these estimates. Such costs are contained in the military personnel appropriation estimates of the military departments. However, all other support costs for military personnel assigned to these activities, such as temporary duty travel, supplies, and office equipment, are included.

OFFICE OF THE SECRETARY OF DEFENSE

Chairman ELLENDER. The information on pages 1 through 4 of the justifications pertaining to the request of $43.7 million for Secretary of Defense activities will be included in the record at this point.

(The information follows:)

Purpose and Scope

Included in this budget project are civilian salaries and other necessary expenses for the Office of the Secretary of Defense, the Deputy Secretary of Defense, the Director of Defense Research and Engineering, the Assistant Secretaries of Defense, the General Counsel of the Department of Defense and such special assistants as the Secretary requires to advise him in specialized fields.

Pay and allowances for the military personnel assigned to these activities are not included in the estimates for this appropriation, but are provided in the military personnel appropriation estimates under Title I. Other necessary expenses include the transportation and per diem expenses for both civilian and military personnel assigned, their office supplies and equipment, communication expenses, printing and reproduction, and contractual services.

Summary of Obligations by Sub-Project

(In Thousands of Dollars)

Sub-Project	Actual FY 1971	Estimate FY 1972	Estimate FY 1973
Secretary of Defense	154	170	174
Deputy Secretary of Defense	107	129	132
Defense Research and Engineering	3,953	4,437	4,762
Advanced Research Projects Agency	1,818	-	-
ASD(Comptroller)	12,428	12,440	12,525
Formerly in ASD(Administration)	(4,337)	(4,734)	(4,843)
ASD(Health & Environment)	237	380	474
ASD(Installations & Logistics)	7,242	6,738	6,888
ASD(Intelligence)	242	406	455
ASD(International Security Affairs)	1,615	1,824	1,911
ASD(Manpower and Reserve Affairs)	2,445	2,521	2,671
ASD(Public Affairs)	1,455	1,507	1,688
(Security Review)	(305)	(321)	(414)
ASD(Systems Analysis)	2,087	2,416	2,513
ASD(Telecommunications)	402	623	667
General Counsel	955	1,139	1,222
Special Staff Assistants	1,199	1,340	1,381
ATSD(Atomic Energy)	153	162	161
ATSD(Legislative Affairs)	293	293	299
Central Services	4,563	4,951	5,777
Total Direct Obligations	41,348	41,476	43,700
Reimbursable Obligations	137	25	25
Total Obligations	41,485	41,501	43,725

Secretary of Defense Activities
Summary of Year End Personnel Requirements By Sub-Project

Sub-Project	Actual Year End Strength FY 1971			Estimated Year End Strength FY 1972			Estimated Year End Strength FY 1973		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Secretary of Defense	5	2	7	5	2	7	5	2	7
Deputy Secretary of Defense	4	2	6	5	2	7	5	2	7
Defense Research and Engineering	152	48	200	180	60	240	180	60	240
Advanced Research Projects Agency	81	22	103	-	-	-	-	-	-
ASD(Comptroller)	524	120	644	535	125	660	528	125	653
Formerly in ASD(Administration)	(219)	(105)	(324)	(247)	(113)	(360)	(240)	(113)	(353)
ASD(Health & Environment)	12	16	28	19	22	41	22	19	41
ASD(Installation & Logistics)	218	48	266	221	44	265	221	44	265
ASD(Intelligence)	12	11	23	20	15	35	20	15	35
ASD(International Security Affairs)	75	80	155	88	61	149	88	61	149
ASD(Manpower & Reserve Affairs)	105	81	186	111	84	195	111	84	195
ASD(Public Affairs)	77	90	167	75	96	171	79	92	171
(Security Review)	(14)	(18)	(32)	(14)	(20)	(34)	(18)	(16)	(34)
ASD(Systems Analysis)	105	50	155	104	48	152	104	48	152
ASD(Telecommunications)	21	5	26	27	4	31	27	4	31
General Counsel	43	3	46	49	2	51	49	2	51
Speical Staff Assistants	55	32	87	53	27	80	53	27	80
ATSD(Atomic Energy)	9	19	28	9	18	27	9	18	27
ATSD(Legislative Affairs)	16	13	29	17	13	30	17	13	30
Intermittent Consultants	13	-	13	17	-	17	17	-	17
Central Services	70	-	70	62	-	62	62	-	62
Total Personnel Requirements	1,597	642	2,239	1,597	623	2,220	1,597	616	2,213

Secretary of Defense Activities
Summary of Average Personnel Requirements by Sub-Project

Sub-Project	Average FY 1971			Average FY 1972			Average FY 1973		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Secretary of Defense	5	2	7	5	2	7	5	2	7
Deputy Secretary of Defense	5	2	7	5	2	7	5	2	7
Defense Research & Engineering	162	50	212	170	60	230	178	60	238
Advanced Research Projects Agency	85	23	108	-	-	-	-	-	-
ASD(Comptroller)	575	150	725	528	125	653	522	125	647
Formerly in ASD(Administration)	(238)	(130)	(368)	(235)	(113)	(348)	(238)	(113)	(351)
ASD(Health & Environment)	13	16	29	16	22	38	21	19	40
ASD(Installations & Logistics)	256	60	316	227	44	271	224	44	268
ASD(Intelligence)	12	10	22	18	15	33	20	15	35
ASD(International Security Affairs)	79	80	159	85	61	146	86	61	147
ASD(Manpower & Reserve Affairs)	112	90	202	105	84	189	109	84	193
ASD(Public Affairs)	78	98	176	75	96	171	79	92	171
(Security Review)	(15)	(20)	(35)	(14)	(20)	(34)	(17)	(16)	(33)
ASD(Systems Analysis)	102	58	160	104	48	152	105	48	153
ASD(Telecommunications)	14	4	18	25	4	29	26	4	30
General Counsel	43	3	46	46	2	48	48	2	50
Special Staff Assistants	52	31	83	53	27	80	53	27	80
ATSD(Atomic Energy)	10	18	28	10	18	28	9	18	27
ATSD(Legislative Affairs)	17	15	32	17	13	30	17	13	30
Intermittent Counsultants*	(4)	-	(4)	(5)	-	(5)	(6)	-	(6)
Central Services	39	-	39	35	-	35	35	-	35
Total Average Personnel Requirements	1,659	710	2,369	1,524	623	2,147	1,542	616	2,158

* Averages included in respective employing activities

IMPACT OF CIVILIAN PERSONNEL COSTS

Mr. COOKE. The funds required to operate the Office of the Secretary of Defense are largely determined by the number of civilian personnel employed. The impact of personnel costs on our funding requirements is clear from the following table:

(The table follows:)

[Dollar amounts in thousands]

	Civilian personnel cost	Total direct obligations	Percentage relationship
Fiscal year—			
1969	$29,983	$37,525	79.9
1970	33,737	41,337	81.6
1971	34,447	41,348	83.3

CIVILIAN SALARIES

Chairman ELLENDER. As I understand it, the salaries for the civilian employees are included in this request, but the cost of the military personnel is not. Am I correct?

Mr. COOKE. Yes, sir. The cost of the military personnel assigned to the Office of the Secretary of Defense, is paid by their respective military departments, as far as pay and allowances are concerned, and the point I was making with regard to the budget request is that it is largely a people's budget. In our actual costs in fiscal year 1971, for example, as a percentage of direct obligations, 83.3 percent of that total relates to civilian salaries and related benefits; retirement and health benefits and the like.

Chairman ELLENDER. That includes the salaries of every civilian in the Office of the Secretary?

Mr. COOKE. Yes, in the Office of the Secretary of Defense.

Chairman ELLENDER. Including the Secretary's salary?

Mr. COOKE. Yes, sir. Under our O. & M. appropriation.

Chairman ELLENDER. How many people does it involve? Is that in the statement?

Mr. COOKE. Yes, sir.

Chairman ELLENDER. Then, proceed.

EMPLOYMENTS, 1970–73

Mr. COOKE. As I said, I would like to emphasize that these are not estimated figures but are based on actual costs recorded during the respective fiscal years. I believe the above statistics properly define this budget as a people's budget. In other words the only significant cost controls available to us are through the control of employment. This control principal has been our main management guide for the past several years. The figures below show the actual yearend employment as recorded for the past 3 fiscal years.

(The table follows:)

	Civilian	Military	Total
Fiscal year—			
1969	1,856	737	2,593
1970	1,779	712	2,491
1971	1,597	642	2,239

PERSONNEL STABILITY, 1971–73

Mr. COOKE. Since fiscal year 1969, Mr. Chairman, the table indicates we have cut the total size of the office of Secretary of Defense by 13.6 percent over the 3-year period.

As you know, reducing personnel is not an easy task; we have been able to make this progress because of phasing out jobs that were created to support the Vietnam conflict, by reassessing priorities and by a stubborn attitude toward reducing costs. Now, after over 3 years of reducing personnel, we believe it is necessary to level off our employment planning. The estimates for fiscal year 1972 and fiscal year 1973 for civilian personnel yearend employment are the same as our actual experience in fiscal year 1971, while military employment is estimated to decrease from 642 in fiscal year 1971 to 616 in fiscal year 1973. Average employment is estimated to increase by a total of 11 spaces in fiscal year 1973 over fiscal year 1972 but will still remain 8.9 percent or 211 spaces lower than our actual fiscal year 1971 experience.

Mr. Chairman, in your analysis of our personnel and our funding requirements, we would ask you to consider that even though we have reduced employment every year since fiscal year 1969 we are now seeking to maintain a level program.

FUNDING INCREASE OVER 1972

Our fiscal year 1973 funding requirements for the operation of the Office of the Secretary of Defense total $43,700,000, an increase of $2,224,000 over our current year requirements. This being a people's budget, the largest portion of the increase, 64 percent or $1,418,000 is for civilian personnel costs.

Chairman ELLENDER. This indicates that, although we have had reductions in personnel, your expenses have not gone down.

Mr. COOKE. No; our costs continue to rise, largely because of Federal pay raises, increases in the Government's contribution to retirement, health benefits, and, in some cases, increases in the cost of travel.

As I said, of our $2,224,000 increase over current requirements, 64 percent is for civilian personnel costs.

In other words, the major portion of the personnel cost increases are the result of increases authorized by law over which we have no control. For instance, the cost of annualizing the civilian pay raise granted in January of this year is $838,000 and within-grade salary adjustments for currently employed personnel will cost an addititonal $272,000. These two items alone represent 78 percent of the increase requested in personnel compensation and benefits. In looking at our overall increased requirements for fiscal year 1973, the only other significant increase is in the central services account where we budget for our day-to-day housekeeping costs. We are requesting an additional $826,000

for this category. The increases are principally attributable to the following: (1) $105,000 to cover payments for services rendered by other Government agencies (Labor, GSA, State, USPS and Agriculture); (2) $529,000 for computer services; (3) $50,000 for building maintenance and alterations; (4) $50,000 increase telephone costs and $92,000 to cover miscellaneous equipment purchases, equipment maintenance, printing, training, and accreditation expenses.

SUMMARY OF REQUIREMENTS

For your convenience, we are providing a summary of the Office of the Secretary of Defense financial requirements—attachment 1, and a summary of personnel requirements—attachment 2.

(Attachments 1 and 2 follow:)

Attachment 1

Secretary of Defense Activities
Summary of Financial Requirements
(In thousands of dollars)

Type of Expense	FY 1971 Actual	FY 1972 President's Budget	FY 1972 Adjustments	FY 1972 Revised Estimate	FY 1973 Budget Estimate
Civilian personnel costs	34,447	35,289	-1,131	34,158	35,576
Travel & transportation of persons	1,577	1,908	-77	1,831	1,850
Transportation of things	95	87	+13	100	100
Utilities and Rents	139	170	+3	173	183
Communications	769	776	+69	845	935
Purchased Equipment Maintenance (intra-DOD)	48	55	-	55	55
Purchased Equipment Maintenance (Commercial)	107	160	-30	130	140
Printing and reproduction	983	1,088	-6	1,082	1,100
Other Services:	2,738	4,214	-1,562	2,652	3,281
Building maintenance and repairs	(162)	(300)	(-150)	(150)	(200)
Official representation	(75)	(100)	(-)	(100)	(100)
Management contracts	(1,046)	(846)	(-)	(846)	(845)
Other	(1,455)	(2,968)	(-1,412)	(1,556)	(2,136)
Supplies and materials	236	250	-	250	250
Equipment purchases	209	200	-	200	230
Total (Direct Obligations)	41,348	44,197	-2,721	41,476	43,700

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Attachment 2

Office of the Secretary of Defense
Summary of Personnel Requirements

	FY 1971 Actual	FY 1972 President's Budget	FY 1972 Adjustments	FY 1972 Revised Estimate	FY 1973 Budget Estimate
Year End Strength:					
Civilian					
Full-time	1,533	1,525	-7	1,518	1,518
Temporary Employees	2	36	+1	37	37
When actually employed	62	43	-1	42	42
Sub-Total-Civilian	1,597	1,604	-7	1,597	1,597
Military	642	608	+15	623	616
Total-Year End	2,239	2,212	+8	2,220	2,213
Average Employment:					
Civilian					
Full-time	1,620	1,542	-58	1,484	1,501
Temporary Employees	9	10	-	10	10
When actually employed	30	34	-4	30	31
Sub-Total-Civilian	1,659	1,586	-62	1,524	1,542
Military	710	608	+15	623	616
Total-Average Employment	2,369	2,194	-47	2,147	2,158

CIVILIAN PERSONNEL

Mr. COOKE. Mr. Chairman, this completes the portion of the statement devoted to the Office of the Secretary of Defense, and I would be glad to answer your questions on that Office now or continue with the entire statement at this point, sir.

Chairman ELLENDER. Does that exhibit which you are putting in the record, indicate the total number of civilians, let us say, last year and the year before as compared to the 1973 request?

Mr. COOKE. Attachment 2 shows the total number of civilians under this appropriation; our fiscal year 1971 actual, fiscal year 1972 President's budget, our revised fiscal year 1972 estimate, and fiscal year 1973 budget estimate.

MILITARY PERSONNEL

Chairman ELLENDER. Is the same information provided for military personnel?

Mr. COOKE. Yes, sir. The same thing for the military.

Chairman ELLENDER. To what extent does it indicate that the number of military people in the Office of the Secretary of Defense either increase or decrease?

Mr. COOKE. Our actual number of military in fiscal year 1971 was 642. This is year-end strength. Our projected year-end strength in the fiscal year 1973 budget as shown in attachment 2 is 616.

MILITARY RANKS

Chairman ELLENDER. Have you the grades of the people involved in that work? How many generals and how many admirals do you have? If you don't have it available, please furnish it for the record.

Mr. COOKE. I would be glad to furnish it for the record, Mr. Chairman.

I do have the authorized fiscal year 1973 strength available, which indicates we have approximately 36 flag and general officers of that total and 244 colonels or captain equivalents. Now, we have a total of 475 officers and the rest of the 616 are enlisted personnel.

(The information follows:)

SecDef Military End Strengths

Based on Authorized Positions

FY 19 73

73 Column of 73 Budget

	OFFICERS										ENLISTED								GRAND TOTAL
	O-9	O-8	O-7	O-6	O-5	O-4	O-3	O-2 & O-1	W. O.	Total Officers	E-9	E-8	E-7	E-6	E-5	E-4	E-3 & E-2	Total Enlisted	
Sec Def		1		1						2									2
Dep Sec			1	1						2									2
DDR&E	1		5	47	7					60									60
ARPA																			
ASD (Comp)			1	19	20	8	5	2	1	56	5	5	20	24	9	6		69	125
DASD (A)				(17)	(15)	(6)	(3)	(2)	(1)	(44)	(5)	(5)	(20)	(24)	(9)	(6)		(69)	(113)
ASD (H&E)		2	1	13						16				2	1			3	19
ASD (I&L)	1		7	28	6	1				43			1					1	44
ASD (I)	1			8	1		1			11	1		1	1	1			4	15
ASD (ISA)		5		31	12	1	1			50			2	5	4			11	61
ASD (M&RA)	1	2		41	17	3	3			67		1	2	3	11			17	84
ASD (PA)		1	3	17	39	8	3			71	4	2	4	8	3			21	92
ASD (SA)				4	33	6	4			47					1			1	48
ASD(T)				3						3			1					1	4
Gen. Counsel						1	1			2								-	2
Spec. Staff Asst.		1		16	2	1				20	1		3	3				7	27
ATSD (AE)			1	7	6					14	1		1	2	2			4	18
ATSD (LA)		1		8	2					11								2	13
TOTALS	4	13	19	244	145	29	18	2	1	475	12	8	35	48	32	6		141	616

CIVILIAN PERSONNEL

Chairman ELLENDER. Are reductions contemplated in civilian personnel in the Office of the Secretary of Defense in fiscal year 1973?

Mr. COOKE. Mr. Chairman, there are no civilian reductions projected from the end of fiscal year 1972 to the end of fiscal year 1973 strength. If I may, in civilians we have in the 3-year period from 1,856 actually on board at the end of fiscal year 1969 to 1,597 at the end of fiscal year 1971, and we are leveling out as of that date. So we have made some substantial reductions.

Chairman ELLENDER. I wish you would provide by grade the number of civilian personnel employed in the Office of the Secretary of Defense.

Mr. COOKE. I will supply it for the record.

(The information follows:)

Office of the Secretary of Defense
Civilian Personnel End Strengths By Grade

Permanent Positions	FY 1973
Executive Levels I thru V	25
GS-18	33
GS-17	46
GS-16	89
GS-15	345
GS-14	116
GS-13	58
GS-12	33
GS-11	35
GS-10	19
GS- 9	74
GS- 8	75
GS- 7	233
GS- 6	190
GS- 5	41
GS- 4	10
GS- 3	16
GS- 2	1
PL-313 (10 U.S.C. 1581)	53
FD-1 (22 U.S.C. 2385)	1
FD-2 (22 U.S.C. 2385)	4
Ungraded	21
Sub-total (permanent positions)	1,518
Temporary and Intermittent Positions	
WAE Secretarial & Clerical (GS-1 thru GS-7)	25
Summer Employees (GS-1 thru GS-7)	37
WAE Consultants (Ungraded)	17
Sub-total (temp. & int. positions)	79
TOTAL	1,597

MILITARY GRADES

Chairman ELLENDER. Would you supply for the record reductions made in the military grades in the Office of the Secretary of Defense.

Mr. COOKE. I shall supply it for the record, sir.

(The information follows:)

OFFICE OF THE SECRETARY OF DEFENSE, MILITARY PERSONNLE END STRENGTHS (BY GRADE)

Grade	Fiscal year— 1971 actual	1972 estimate	1973 estimate
O–9—Lieutenant general/vice admiral	4	4	4
O–8—Major general/rear admiral	4	13	13
O–7—Brigadier general/rear admiral	18	19	19
O–6—Colonel/captain	183	247	244
O–5—Lieutenant colonel/commander	172	149	145
O–4—Major/lieutenant commander	63	29	29
O–3—Captain/lieutenant	30	18	18
O–2 and O–1—Lieutenant/ensign	9	2	2
Warrant officer	4	1	1
Enlisted	155	141	141
Totals	642	623	616

ORGANIZATION OF JOINT CHIEFS OF STAFF

SUMMARIES OF FINANCIAL AND PERSONNEL REQUIREMENT

Mr. COOKE. Next, Mr. Chairman, I invite your attention to the budget requirements of the Organization of the Joint Chiefs of Staff. You will find attached to this statement two tabulations pertaining to OJCS; a summary of financial requirements (attachment 3) and a summary of personnel requirements (attachment 4).

Chairman ELLENDER. The information on pages 1, 2, 4, and 6 of the justifications pertaining to the request of $8.4 million for the Organization of the Joint Chiefs of Staff will be included in the record along with attachments 3 and 4 of your statement.

(The information follows:)

Justification

Purpose and Scope

This budget project provides the civilian salaries and other necessary expenses for the Organization of the Joint Chiefs of Staff. The Joint Chiefs of Staff are the principal military advisors to the President, the National Security Council and the Secretary of Defense.

Pay and allowances for the military personnel assigned to the Organization of the Joint Chiefs of Staff are not included in the estimate for this appropriation, but are provided in the military personnel appropriations. Other necessary costs include the transportation and per diem expenses for both civilian and military personnel assigned, their office supplies and equipment, communication expenses, printing and reproduction, and miscellaneous purchased services.

The Chairman serves as a member of and presides over the Joint Chiefs of Staff. He is responsible for the Organization of the Joint Staff, the subordinate structure of the Joint Chiefs of Staff, and the management of the Joint Staff and its Director on behalf of the Joint Chiefs of Staff. The Chairman furnishes the Secretary of Defense with periodic reports on important considerations of the Joint Chiefs of Staff and provides military advice to the Office of the Secretary of Defense.

The Joint Staff is composed of the Director, Joint Staff and five directorates responsible for providing assistance to the Joint Chiefs of Staff in the fields of personnel, operations, logistics, plans and policy, and communications-electronics.

The other JCS activities include the Joint Secretariat, the Directorate of Administrative Services, the Assistant to the Chairman for Strategic Arms Negotiations, the U.S. Delegation, United Nations Military Staff Committee and the Studies, Analysis and Gaming Agency. In addition, there are four Deputy Directors for Operations responsible for providing assistance to the Operations Directorate in the fields of command and control, environmental services, reconnaissance and electronic warfare, and counterinsurgency and special activities.

Summary of Average Personnel Requirements

By Type of Employment	FY 1971			FY 1972			FY 1973		
Direct Hire	Civ.	Mil.	Total	Civ.	Mil.	Total	Civ.	Mil.	Total
Full-Time Permanent	378	1,305	1,683	386	1,329	1,715	401	1,319	1,720
Temporary/Intermittent	10	-	10	11	-	11	11	-	11
Total (Direct Hire)	388	1,305	1,693	397	1,329	1,726	412	1,319	1,731
By Organizational Unit									
Office of the Chairman	13	29	42	13	34	47	13	36	49
Joint Staff	196	382	578	205	385	590	209	385	594
Other JCS Activities	179	894	1,073	179	910	1,089	190	898	1,088
Total	388	1,305	1,693	397	1,329	1,726	412	1,319	1,731

General Explanation of Estimates

The fund request of $8,418,000 for FY 1973 is an increase of $740,000 over the current year program. The estimate provides for an increase of $559,000 in civilian personnel cost for the employees normal within grade salary increases, the annualization effect of the January 1972 civilian pay raise, the increase in the amount of Government contribution for employee health benefits as a result of premium rate increases effective January 1972, and the cost of 15 additional man years of civiliam employment. The latter is primarily for the support of additional tasks assigned as a result of decisions made by the Secretary of Defense to implement recommendations in the Blue Ribbon Panel report and to support the World War II records declassification program. The remaining increase of $181,000 is needed to fund TDY travel and other support cost associated with the new tasks assigned and expansion of the Strategic Arms Negotiations.

Summary of Financial Requirements
(In thousands of dollars)

Attachment 3

Type of Expense	FY 1971 Actual	FY 1972 President's Budget	FY 1972 Adjustments	FY 1972 Revised Estimate	FY 1973 Budget Estimate
Civilian personnel costs	5,154	5,649	+94	5,743	6,302
Travel and transportation of personnel and things	389	513	-42	471	536
Utilities and rents	271	270	+34	304	330
Communications	368	300	+68	368	388
Purchased equipment maintenance (commercial)	88	85	-0-	85	87
Printing and reproduction	48	48	-0-	48	50
Other Services:	288	250	-0-	250	293
Building maintenance and repairs	(110)	(96)	-0-	(96)	(96)
Official representation	(23)	(23)	-0-	(23)	(23)
Other	(155)	(131)	-0-	(131)	(174)
Supplies and materials	285	290	-0-	290	300
Equipment purchases	208	119	-0-	119	132
Total (Direct Obligations)	7,099	7,524	+154	7,678	8,418

Attachment 4

Summary of Personnel Requirements

	FY 1971 Actual	FY 1972 President's Budget	FY 1972 Adjustments	FY 1972 Revised Estimate	FY 1973 Budget Estimate
Year End Strength:					
Civilian					
Full-time	370	400	+3	403	403
Temporary Employees	27	20	-0-	20	20
When actually employed	7	10	-0-	10	10
Sub-Total-Civilian	404	430	+3	433	433
Military	1,272	1,299	+15	1,314	1,319
Total-Year End	1,676	1,729	+18	1,747	1,752
Average Employment:					
Civilian					
Full-time	378	388	-2	386	401
Temporary Employees	6	6	-1	5	5
When actually employed	4	5	+1	6	6
Sub-Total-Civilian	388	399	-2	397	412
Military	1,305	1,299	+30	1,329	1,319
Total-Average Employment	1,693	1,698	+28	1,726	1,731

CIVILIAN AND MILITARY END STRENGTHS

Mr. COOKE. In fiscal year 1973 the end strengths for civilian and military employment are estimated to be 1,752, which is a reduction of over 16 percent when compared to the actual end strength of 2,035 for fiscal year 1969. I would like to point out that in this interval, the Joint Chiefs of Staff have been assigned additional responsibilities; that is, military representation at SALT talks, managerial supervision of the ADP system of the worldwide military command control system (WWMCCS), inspection/review responsibility for Command Headquarters and joint activities, the nuclear weapons status functions, and participation in the World War II records declassification program.

CIVILIAN GRADES

Chairman ELLENDER. Please provide for the Organization of the Joint Chiefs of Staff a breakdown by grade of civilian personnel similar to that requested for the Office of the Secretary of Defense.

Mr. COOKE. I will be glad to.

(The information follows:)

SUMMARY OF YEAREND CIVILIAN EMPLOYMENT BY GRADE

	Fiscal year—			
	1969 actual	1971 actual	1972 estimate	1973 estimat e
GS-17	2	1	1	1
GS-16	1	1	1	1
GS-15	8	8	9	9
GS-14	12	12	15	14
GS-13	11	9	10	9
GS-12	16	17	22	20
GS-11	22	14	14	13
GS-10	4	2	1	1
GS-9	32	21	23	23
GS-8	20	14	15	15
GS-7	102	91	104	104
GS-6	103	97	109	103
GS-5	102	82	90	90
GS-4	16	19	11	16
GS-3	12	4	2	6
GS-2	0	0	2	4
Total, general schedule grades	463	392	429	429
Ungraded	11	12	4	4
Total	474	404	433	433

MILITARY PERSONNEL REDUCTIONS SINCE 1969

Mr. COOKE. We had 1,272 military at the end of 1971.

Chairman ELLENDER. What reduction has been made in military personnel since 1969? Will you furnish for the record the number of military personnel in 1969, their grades, and then how such personnel has been reduced in 1971 and 1972 and your projected number for 1973?

Mr. COOKE. I will be glad to do that, sir.

(The information follows:)

SUMMARY OF MILITARY PERSONNEL END STRENGTH BY RANK

Rank	Fiscal year— 1969 actual	1971 actual	1972 revised estimate	1973 estimate
General/admiral	1	1	1	1
Lieutenant general/vice admiral	6	7	7	7
Major general/rear admiral	9	10	10	10
Brigadier general/rear admiral (LH)	26	21	22	22
Colonel/captain	396	301	365	365
Lieutenant colonel/commander	346	309	319	324
Major/lieutenant commander	111	87	51	51
Captain/lieutenant	12	10	5	5
1st lieutenant/lieutenant junior grade	2	2		
2d lieutenant/ensign	1			
Warrant	6	6	3	3
Enlisted	645	518	531	531
Total	1,561	1,272	1,314	1,319

PERSONNEL INCREASE OVER 1971: RIFS AND AVERAGE AND END STRENGTHS

Senator YOUNG. Mr. Chairman, what is the reason for the increase in personnel from 1971?

Mr. COOKE. Mr. Nestor?

Mr. NESTOR. Sir, the personnel figures for 1971 are actual onboard personnel at that date, June 30. In the previous budget JCS was authorized a total of 1,729 for fiscal year 1971 and 1,729 for fiscal year 1972. We are not really increasing the authorization as much as reflected in the budget documents since this is the actual onboard strength rather than authorization. We were unusually low in the employment at the end of fiscal year 1971 due to the fact there were several RIF's being implemented throughout Defense in order to reduce personnel in general.

The Secretary placed restrictions on employment throughout the fiscal year 1971 in an effort to relocate as many as possible of the people that were involved in the RIF.

As a result, the employment level was unusually low at that point in time.

Mr. COOKE. I might add that the year-end strength figure at the end of the fiscal year 1971 and very likely each year, the year-end strength figure for the military on the Joint Chiefs of Staff will show quite low as of that date because it is the beginning of the time when military personnel are ordered in and out of the joint staff for normal rotation of duty assignment. Perhaps the more realistic figure to look at is the second part of attachment 4, average employment tables.

Senator YOUNG. That also shows higher employment. With the winding down of the war, I still don't understand why your employment is higher now than it was then.

INCREASED DUTIES

Mr. COOKE. We show that in fiscal year 1971, our average military was 1,305 and our average military in the budget estimate for fiscal year 1973 is 1,319. The chiefs have had in this interval some rather significant expanded duties, particularly in the area of command and control, the worldwide military command and control system, and they had to augment, because of additional tasks assigned.

Senator YOUNG. You spoke previously of added duties.

Mr. COOKE. Yes, we added duties. I would like to supply an expanded version discussion of those duties to show the reason for the increase for the record, if I may.

Senator YOUNG. According to the table, the total average employment in fiscal year 1971 was 1,693 and the comparable figure in fiscal year 1973 is 1,731 which is attachment 4 on the bottom line.

Mr. COOKE. Yes, our average total employment was 1,693 in fiscal year 1971 and our estimate for fiscal year 1973, is 1,731, an increase of 38, I think.

Yes, 38 positions. I think on the military side they relate to the expanded duties that I referred to and on the civilian side, in carrying out President Nixon's directive on World War II declassification, we are adding five civilian man-years of employment directly associated with that important project. Is that correct?

Mr. NESTOR. Yes, the increase is to support the additional workload assigned.

Senator YOUNG. That helps explain the additional number. I wish you would put it in the record.

Mr. NESTOR. I will expand it for the record.

MAN-YEARS OF ADDITIONAL EMPLOYMENT

Chairman ELLENDER. I notice in your general explanation there are 15 man-years of additional employment. This is primarily for the additional tasks assigned as a result of decisions made by the Secretary of Defense to implement recommendations in the blue ribbon panel report and to support World War II directives and classification programs. Are those some of the areas?

Mr. COOKE. Yes, those are some of the areas I referred to that we will expand for the record.

Chairman ELLENDER. In answer to Senator Young, suppose you indicate what additional areas there are.

Mr. COOKE. I will be pleased to do that.

(The information follows:)

EXPLANATION OF ADDITIONAL TASKS ASSIGNED

The additional tasks assigned the JCS subsequent to the Fiscal Year 1972 President's Budget, for which funds are requested in the Fiscal Year 1973 budget estimate, follow:

1. Responsibility for Inspection/Review of Unified and Specified Command Headquarters and Joint Activities was assigned JCS effective July 1971. This task was accomplished by Office of the Deputy Assistant Secretary of Defense (Inspection Services) until the disestablishment of that office during the prior fiscal year. To support this task the JCS employment was augmented by 1 civilian and 4 military personnel.

2. The Nuclear Warfare Status Division of the Defense Atomic Support Agency (DASA) and its staff of 23 employees (2 civilian and 21 military) was transferred under the Joint Chiefs of Staff responsibility effective July 1971. This change was a result of decisions made by the Secretary to reorganize the DASA and other related activities.

3. The US Element of the US/UK Planning Group, previously under control of CINC/STRIKE Headquarters, was transferred under the control and operation direction of the Joint Chiefs of Staff effective 30 September 1971. The primary mission of the US Element is to conduct coordinated review of military matters and serve as a point of contact with the British Defense Staff. The authorized staff assigned the US Element was reduced from 6 to 5 military personnel at time of transfer to the JCS.

4. An additional 5 military positions have been authorized for Fiscal Year 1973 to provide minimum analytical capability urgently needed to support the decision processes of the Joint Chiefs of Staff. The need to correct this deficiency has become more urgent as the Secretary continues emphasis on decentralization and the Chief's increased role in the decision making process.

5. The Joint Chiefs of Staff has been assigned additional responsibility in carrying out President Nixon's directive on World War II Records Declassification. To support this effort 5 additional man years of civilian employment is requested in the Fiscal Year 1973 estimate.

DECLASSIFICATION PROGRAM

Senator YOUNG. I think your declassification program is long overdue. It will serve a good purpose.

EDUCATION PROGRAMS

BUDGET REQUEST FOR UNITED STATES ARMED FORCES INSTITUTE

Mr. COOKE. May I turn now to education programs?

In the area of education programs the original as well as the current fiscal year 1972 budget estimate for USAFI is $6,492,000. Recent pay raise costs of $69,000 are being absorbed within the original estimate.

Chairman ELLENDER. The information on pages 1, 2, 6, 7, and 8 of the justifications pertaining to the request for $6,486,000 for the Armed Forces Institute will be included in the record at this point.

(The information follows:)

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Justification

Purpose and Scope

The functions of the United States Armed Forces Institute (USAFI), Madison, Wisconsin, a field activity of the Directorate for Education Programs and Management Training, Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) are as follows:

a. USAFI develops and offers through independent study and class instruction methods of study more than 200 civilian-type educational courses ranging from literacy level through pre-high school, high school, and college levels, and in occupational and technical areas. Based on current trends in registration activity, new enrollments in the independent study and class instruction programs will exceed 313,000 during FY 1973.

b. The testing program provided by USAFI consists of course-related subject standardized tests, and a series of general measurement and placement tests. The testing instruments at the high school level and above carry American Council on Education recommendations for recognition of academic equivalency in civilian institutions and meet military educational qualification requirements for entrance into military training schools. Based on current trends in activity, 305,000 test reports will be issued in FY 1973 to participating students.

c. Counseling and guidance services are provided as an integral part of registration and testing services.

d. Research involving student activity, program offerings, and educational benefits obtained through program participation is conducted on a continuing basis.

e. All USAFI educational services and materials are provided through the central USAFI office in Madison, Wisconsin.

Summary of Estimate

Description	Obligations (In thousands of dollars) FY 1971	FY 1972	FY 1973
Direct Obligations	5,866	6,492	6,486
Reimbursable Obligations	66	75	75
Total Obligations	5,932	6,567	6,561

	Personnel Summary FY 1971			FY 1972			FY 1973		
	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total
Full time positions (year end)	224	0	224	220	0	220	220	0	220
Average strength	228	0	228	219	0	219	218	0	218

Explanation of Estimates

Total Direct Obligations	Amount (In thousands)
FY 1973	$6,486
FY 1972	6,492
FY 1971	5,866

Civilian Personnel

A stable employment level during FY 1973 of 220 authorized positions will result in 218 man-years of paid employment. However, the increase in the government's contribution to the health insurance program combined with wage rate increases and increases for the 1972 General Schedule Pay Act will increase overall personnel costs by $148,000.

Travel and Transportation of Persons

Travel funds for USAFI are utilized by professional personnel in traveling to civilian and military conferences and to military installations in order to update their contacts in their professional activities or to coordinate operations of the Institute. Administrative personnel travel to coordinate operational and policy control. Training programs for professional, technical, and administrative personnel represent a further requirement. In FY 1973 there is a priority requirement for research personnel to visit military installations.

USAFI Correspondence Lesson Service

Lessons submitted to USAFI, Madison, by USAFI correspondence course enrollees are graded by the professional staff of a large Midwestern university under contract to USAFI. On the basis of historical trends, we may anticipate an increase in per lesson grading costs due to increased faculty salaries and administrative expenses of the contractor. During FY 1973, a computer will be utilized to grade a number of lessons "in-house," resulting in an appreciable decrease in contractual costs.

University Lesson Service

There are presently forty-five colleges and universities under contract with USAFI, Madison, to make their correspondence courses available to service personnel. USAFI pays the fees required for the grading of lessons submitted by servicemen enrolled under these contracts, while the student pays the enrollment fee and materials costs.

Professional Services

The professional services which are acquired under this account consist of panels of civilian educational specialists who are retained from the civilian educational community to aid in the selection of textbooks used in USAFI courses and to assist in the development of an expanded testing program.

Study Guide Construction

The development of a study guide manuscript as a component of a USAFI course is in some instances done by civilian subject specialists under contract. The cost averages about $2,000 per manuscript.

Test Construction

The FY 1973 schedule calls for twenty USAFI Subject Standardized Tests to be developed on a contractual basis and for the development of one new form of the high school GED Tests.

American Council on Education

The American Council on Education provides a Commission on Accreditation of Service Experiences (CASE) which performs the service of evaluating the education programs of the Department of Defense in relationship to their equivalency in civilian educational credit. The work of the Commission is accomplished under a non-profit cost contract.

Research Projects

Funds budgeted for research programs are required by USAFI to conduct research and evaluation projects which are used in developing policy guidance and structuring the objectives of USAFI. A series of projects designed to obtain a better understanding of the USAFI student and his specific needs with emphasis on why correspondence course students do or do not complete courses is scheduled for FY 1973.

Educational Materials and Supplies

The educational materials comprising the major portion of the USAFI inventory are end product textbooks purchased from publishers. Through a process of stringent controls on the distribution, use, and return of these materials, USAFI will attempt to maintain a limited inventory of all educational materials with expenditures in FY 1973 which will be about $158,000 below the FY 1972 level.

Printed Educational Materials

Most educational material offered by USAFI is purchased on an end product basis from publishers. However, some items are purchased in manuscript form for later printing by government facilities. The amount budgeted for FY 1973 is a projection of FY 1972 costs.

Administration and Overhead

This account is comprised of a group of operating expenses that remain fairly constant from year to year. A slight increase reflects added demands for "software" used in computer processing and for specialized packing and crating material to be used in shipping course materials for "hands-on" laboratory projects and occupationally oriented courses.

DIRECT OBLIGATIONAL AUTHORITY

Mr. COOKE. The U.S. Armed Forces Institute (USAFI) for fiscal year 1973 has requested $6,486,000 in direct obligation authority. In spite of the additional costs for annualizing the fiscal year 1972 pay raise, within-grade costs and additional travel requirements the fiscal year 1973 request is $6,000 less than the fiscal year 1972 revised estimates. A summary of the changes is shown in attachment 5.

(Attachment 5 follows:)

EDUCATION PROGRAMS, SUMMARY OF FINANCIAL REQUIREMENTS

[In millions of dollars]

Type of expense	Fiscal year 1971 actual	Fiscal year 1972			Fiscal year 1973 budget estimate
		President's budget	Adjustments	Revised estimate	
Civilian personnel	2,160	2,246	+21	2,267	2,415
Travel of personnel	17	14		14	25
Transportation of things	17	18		18	18
Utilities and rents	208	239	−32	207	207
Communications	655	765	−59	706	706
Purchased equipment maintenance (commercial)	23	24	+2	26	26
Printing and reproduction	385	420		420	420
Other purchased services	1,005	1,156	−5	1,151	1,070
Supplies	1,385	1,606	+72	1,678	1,594
Equipment	11	4	+1	5	5
Total (direct obligations)	5,866	6,492	0	6,492	6,486

LOW COST EDUCATION FOR OFFICERS AND ENLISTED MILITARY PERSONNEL

Mr. COOKE. USAFI offers effective, low-cost educational programs for service men and women. In its academic program, USAFI emphasizes group study courses where texts are provided on a loan basis to servicemen at military installations. In its correspondence program, USAFI emphasizes course completion through counseling of prospective students and methods to encourage completion by those enrolled.

Chairman ELLENDER. This program is available to military personnel only?

Mr. COOKE. Mr. Brodsky.

Mr. BRODSKY. That is correct, Mr. Chairman.

Chairman ELLENDER. Is this service available to our military personnel station overseas?

Mr. BRODSKY. It is available throughout the world.

GROUP STUDY—CORRESPONDENCE PERCENTAGES

Chairman ELLENDER. How much of it is actual teaching in contrast to correspondence course work?

Mr. BRODSKY. It is largely correspondence. Because of the difficulties in having a young man work individually with programs, we have been moving more to what we call "group study," which is teaching.

Correspondence Course Completions

Chairman Ellender. To what extent do those who start a correspondence course complete it? I was informed that many courses are begun by enlisted men but after a short period they stop.

Mr. Brodsky. You are right, Mr. Chairman. This is a real problem with correspondence education. This is why we place greater emphasis on group study and are reducing emphasis on correspondence work.

Within that framework now, the completion of correspondence courses over the last year, since we highlighted methods for improving it, have been raised from roughly—well, where as low as 10 percent may have completd courses before, now we are running at 22 percent.

Enrollment Fee

Chairman Ellender. That is a loss. You pay for the correspondence course when the individual starts it. If he stops, is there a loss there to the Government?

Mr. Brodsky. When the enlisted man enrolls the first time, he pays an enrollment fee of $10 and as long as he completes the course he never again pays an enrollment fee, so in terms of the cost of the materials it is essentially covered by his initial enrollment fee of $10. Our costs run somewhat below that.

Chairman Ellender. Is material the only cost to the individual?

Mr. Brodsky. Yes, sir; because the programs are run basically through USAFI funds.

Chairman Ellender. Is that enrollment fee paid by everybody, or does it apply only to those who desire to pursue correspondence courses?

Mr. Brodsky. The latter, just those who desire to; yes, sir. That money goes back to the Treasury.

Chairman Ellender. I see. Those funds are not used to pay for materials that are sent to the enlisted people?

Mr. Cooke. That is right. The funds that the participants pay go into the general treasury, Mr. Chairman. We don't have the use of them to offset these costs.

Chairman Ellender. When they are appropriated we have a different situation.

Mr. Cooke. Yes.

Group Study

Chairman Ellender. Do you employ teachers who specialize in a particular course, or do the teachers handle a variety of courses to be taught at these camps?

Mr. Brodsky. At a particular camp, Mr. Chairman, an educational officer may find that he has, let us say, 15 people interested in a course in economics or business law. He will then employ a teacher who meets the educational qualifications for coming on the post and for teaching that particular course. So that it is handled locally by the educational officers to meet their local needs.

Chairman Ellender. Have you an officer responsible for activity?

Mr. Brodsky. On every base, where there are more than 750 people there normally is an education officer available who has the responsibility.

Chairman ELLENDER. Those who take those courses, do they pay a fee?

Mr. BRODSKY. Not for the group study; no, sir.

Chairman ELLENDER. That is entirely borne by the Federal Government?

Mr. BRODSKY. That is right, sir.

OFFICE OF INFORMATION FOR THE ARMED FORCES

BUDGET REQUEST

Chairman ELLENDER. If there are no further questions or comments on the Armed Forces Institute we will proceed with the request for $9,703,000 for the Office of Information for the Armed Forces.

Pages 1 through 6 of the justifications pertaining to this request will be included in the record at this point.

(The information follows:)

Justification

Purpose and Scope

The basic mission of the Office of Information for the Armed Forces (IAF) is to direct the Armed Forces Information Program (AFIP) in support of the Department of Defense (DoD) objectives. These objectives are:

1. To increase knowledge, professionalism and pride in the military and to stimulate awareness of the military as a rewarding and productive career;

2. To establish policy and operational guidance throughout DoD to assure free flow of information to military personnel;

3. To assist the individual citizen in uniform to:

   . Appreciate the freedoms he is called upon to defend;

   . Realize his responsibilities under those freedoms;

   . Comprehend the values of our Government and National Heritage;

   . Understand the threats to the nation's security.

4. To provide for commanding officers policy guidance and information including, but not limited to, personal military benefits during and after service in the Armed Forces, U. S. and friendly Military Forces, Citizenship (including voting), Orientation for Overseas Duty, Code of Conduct, World Affairs, and to provide a continuous coverage of international, national, and local U. S. news, seat of government, military and sports news and special events.

5. To provide information materials of common interest to commanding officers; policy and technical guidance, along with supporting materials, to Armed Forces newspapers; policy guidance for civilian enterprise publications and American Forces Radio and Television outlets and networks; general radio and television materials for use by American Forces Radio and Television stations representing the best from American networks and industry; and other audio or visual materials as necessary. Maintain liaison with the broadcast industry, Military Departments, JCS, White House, State Department, and other government and civilian agencies; provide policy and program guidance to Defense Information School.

6. To monitor and evaluate resources, plans, programs, and materials used throughout the Department of Defense in support of the AFIP for effectiveness and the elimination of duplication.

A. American Forces Radio and Television Service

1. AFRTS - Los Angeles - Provides the basic program materials which are used by the AFRTS outlets overseas. The weekly AM program packages provide 80 hours of music, drama, fine arts, information material and specials, and a five-hour library of latest music. A 12-hour package is produced for FM outlets. The weekly 55-hour television package contains programming received from the major commercial broadcast networks, feature films, film syndicators, and short information program materials. The activity annually produces 1,000 radio and 300 television spot announcements supporting military information themes. Over 50,000 slides and 50 short information programs are produced annually for television outlets and 125 short information programs for radio outlets. The world-wide AFRT system includes approximately 351 radio and 94 television overseas stations.

2. AFRTS - Washington - Provides continuous transmittal of international, national, seat of government, military and sports news and special events. This news, gathered from the major U.S. commercial networks, wire services and military correspondents, is transmitted 24 hours a day, seven days a week, by shortwave, direct voice cable, satellite, and teletype to all American Forces Radio and Television networks and outlets world-wide. Provides facsimile photo service to American Forces Television stations.

B. Armed Forces Information Service

1. Armed Forces Media Programming Service - Provides information and policy guidance with multi-media supporting material for use in internal information programs to the Military Services. Principal medium is the Defense Information Guidance Series, designed to disseminate quickly to Armed Forces commanders and personnel current information and policy that will contribute to a better understanding of National defense programs and aid them in accomplishing their missions through increased professional knowledge.

2. American Forces Press Service - Produces the following publications for the Armed Forces:

a. Commanders Digest distributed weekly to military commanders of all the Services and the Reserves. It is designed to provide commanders and their staffs with authoritative information of National and Department of Defense policies and goals and other events of significance.

b. Press Service distributed weekly to the field to assist in publishing base and unit newspapers throughout the world. Current addressees number more than 1,800.

3. Armed Forces Publications - Provide information publications for use by all Military Departments. Approximately 25 publications are produced annually; some are contracted and some are produced in-house. These materials take the form of pamphlets, pocket guides, brochures and similar printed materials.

4. Armed Forces Television Production Service - Produces and distributes approximately 200 video taped and filmed programs for dissemination to American Forces television stations and the military Services. These include: Weekly news features on military activities around the world; in depth programs on important Defense policies; and discussions covering topics of military and command interest, such as supplemental benefits, drugs, cost reductions, equal opportunity, race relations, and retention.

C. Armed Forces Motion Picture Service

Includes the annual procurement or production and distribution of common-use films for Service information programs, distributed in quantities of up to 1,000 prints, depending on Service requirements. In the production of films, this office works with commercial film companies and Service production agencies.

D. Policy and Program Analysis

Monitors and coordinates the Armed Forces Information Program to insure maximum effectiveness and efficiency.

E. The Federal Voting Assistance Task Force

Assists in implementing the recommendation of the Federal Absentee Voting Assistance Act, 50 U.S.C. 1451.

Summary of the Estimate

OBLIGATIONS
(In thousands of dollars)

	Actual FY 1971	Estimate FY 1972	Estimate FY 1973	Change (+) or (-)
Direct Obligations	$5,818	$7,773	$9,703	$+1,930
Reimbursable Obligations	16	1,240	41	-1,199
Total Obligations	$5,834	$9,013	$9,744	$+ 731

Personnel Summary

	FY 1971			FY 1972			FY 1973		
	Civ	Mil	Total	Civ	Mil	Total	Civ	Mil	Total
Full Time Positions (year end)	143	67	210	145	76	221	145	84	229
Average Strength	153	72	225	148	72	220	148	84	232

Summary of the Estimate by SubActivity

OBLIGATIONS
(In thousands of dollars)

	Actual FY 1971	Estimate FY 1972	Estimate FY 1973	Change (+) or (-)
Direct Obligations				
Office of the Director	$ 88	$ 102	$ 104	$ +2
Policy and Program Analysis	288	280	281	+1
American Forces Radio and Television Service	4,185	5,442	6,800	+1,358
Armed Forces Information Service	1,033	1,486	1,321	-165
Armed Forces Motion Picture Service	209	344	1,180	+836
The Federal Voting Assistance Task Force	15	119	17	-102
Total (Direct Obligations)	$ 5,818	$ 7,773	$ 9,703	$+1,930
Reimbursable Obligations				
American Forces Radio and Television Service	16	40	41	+1
Armed Forces Information Service	-	300	-	-300
Armed Forces Motion Picture Service	-	900	-	-900
Total (Reimbursable Obligations)	16	1,240	41	-1,199
Total Direct and Reimbursable Obligations	$ 5,834	$ 9,013	$ 9,744	$ +731

1972 BUDGET REQUESTS

Mr. COOKE. The original fiscal year 1972 budget estimate for this program was $6,396,000 and subsequently supplemented by $1 million to support the drug abuse information program, $306,000 for 8 months of additional TV sports programs, for Vietnam, and $71,000 for the cost of the fiscal year 1972 pay raise resulting in a fiscal year 1972 revised estimate of $7,773,000.

INCREASE OVER 1972

A direct obligational authority of $9,703,000 is requested for fiscal year 1973, a net increase of $1,930,000 over fiscal year 1972. Increases are requested in support of the following: (1) $1,200,000 to produce and distribute films and publications in support of the internal information programs of the military services and to continue replacement of obsolete films (these programs were supported in fiscal year 1972 by the military services on a reimbursable basis in the same amount stated above); (2) $162,000 to cover full year's cost of additional sports programs on film for TV and $280,000 for live television coverage via satellite of seven major sports events; (3) $397,000 for cost of two TV film circuits for approximately 20 Navy ships; and (4) $169,000 for cost of radio voice-grade circuit to the Caribbean and Panama Canal Zone, and the balance of $397,000 is attributable primarily to increased costs of penalty mail, annualization of the fiscal year 1972 pay increase and inflationary and other cost increases in radio and television contract services, supplies, and rent.

DECREASES

The total increase of $2,605,000 is offset by decreases of $75,000 in distribution of video taped and filmed programs, $100,000 on one-time funds provided in fiscal year 1972 for a postelection survey of persons covered by the Federal Voting Assistance Act of 1955, and $500,000 in the drug abuse information program.

SUMMARY OF FINANCIAL REQUIREMENTS

For your convenience, the detailed summary of the Office of Information for the Armed Forces financial requirements is provided as attachment 6.

(Attachment 6 follows:)

Attachment 6

Office of Information for the Armed Forces
Summary of Financial Requirements
(In thousands of dollars)

Type of Expense	FY 1971 Actual	FY 1972 President's Budget	FY 1972 Adjustments	FY 1972 Revised Estimate	FY 1973 Budget Estimate
Civilian Personnel	2,290	2,314	+63	2,377	2,455
Travel of Personnel	69	89	-17	72	62
Transportation of Things	2	1	-	1	1
Utilities and Rents	62	66	+3	69	80
Communications	476	537	+10	547	1,175
Purchased Equipment Maintenance (Intra-DoD)	6	2	+2	4	6
Purchased Equipment Maintenance (Commercial)	37	30	+13	43	45
Printing and Reproduction	502	319	+221	540	671
Other Purchased Services	2,113	2,837	+733	3,570	4,922
Supplies	223	169	+337	506	247
Equipment	38	32	+12	44	39
Total (Direct Obligations)	5,818	6,396	+1,377	7,773	9,703

FURNISHING OF MATERIAL TO POSTS

Chairman ELLENDER. This program is exclusively for the military personnel.

Mr. BROGER. Yes, sir.

Chairman ELLENDER. If a post has a theater, you provide films?

Mr. BROGER. It may not be always in a theater, just in a dayroom, and the number of people may vary from area to area, but, yes, sir, we will supply the film to the post and it will be through a film library, but directly to the commander and his troops wherever they are.

Chairman ELLENDER. That is done more or less for the entertainment of the men in the service?

Mr. BROGER. No, sir, most of these programs in that category are things like drug abuse or benefits to the serviceman, things he needs to know, benefits and advantages directly to him. This is not entertainment, sir.

SPORTS PROGRAM

Chairman ELLENDER. What about sports?

Mr. BROGER. That is another program. The Secretary of Defense was in Vietnam and discovered that when many people were off duty they had too much free time on their hands in the evening and he decided we needed something more highly motivational and we put in increased sports programs and we hoped to obtain money to increase sports programing considerably for television and we hope, also, to have some funds available for seven sports events which we will provide live through satellite, that is the Army-Navy game and the World Series, and games like this, and we find this is one of the most highly appreciated and motivated things we can do.

Chairman ELLENDER. That is particularly applicable to troops abroad?

DRUG ABUSE AND OTHER MANDATORY PROGRAMS

Chairman ELLENDER. How do you deal with material on drug abuse?

Mr. BROGER. The films which do not go over television only, we do put them on television, but they are for direct projection, where you have a projector, a screen, and the troops around it, so that the films on drug abuse, veterans' benefits, anything that the troops ought to know is a mandatory program, whereas television is not a mandatory program.

Chairman ELLENDER. Such information is furnished both to the troops abroad and those here in this country?

Mr. BROGER. Yes, sir.

Chairman ELLENDER. Continue, Mr. Cooke.

DRUG ABUSE INFORMATION INCREASE

Senator YOUNG. First, Mr. Chairman, I want to commend you, Mr. Broger, for expanding these athletic programs and things of that sort. I would think they would be of invaluable help to the servicemen when they might not have much to do.

I note an increase in funds for drug abuse information. Just what kind of information do you provide and why is there an increase in the program?

Mr. BROGER. We were provided, Senator, a $1-million fund for a crash program this year in drug abuse information and it included nine feature films which will also be good in fiscal year 1973 programs.

So there will be a carryover of the use of the films even though we should have additional funds for use in fiscal 1973. This will include drug abuse kits, the most important, information that is available from anywhere in the country, which will be in printed kit form for the use of teams who will be working in the military. This will also be good next year. We will supplement it by the $500,000 requested for fiscal year 1973, to update material or add new additional material that will come along. We believe this $500,000 will carry the program.

Senator YOUNG. Aren't you asking for more than $500,000?

Mr. BROGER. No, sir; we are not. As a matter of fact, this is the first time we have had and asked for a specific budget program on the subject of drug abuse.

Senator YOUNG. Thank you.

Chairman ELLENDER. You have completed your testimony?

Mr. COOKE. Yes, Mr. Chairman; that completes our testimony.

Chairman ELLENDER. Be sure to furnish the information.

Mr. COOKE. Yes, sir; we will furnish the information.

Thank you.

LANGUAGE CHANGES

Chairman ELLENDER. At this point in the record there will appear a statement by Mr. Maurice H. Lanman, Assistant General Counsel of the Department of Defense, outlining proposed language changes in the fiscal year 1973, appropriations bill.

(The statement follows:)

STATEMENT OF MAURICE H. LANMAN, ASSISTANT GENERAL COUNSEL, FISCAL MATTERS, OFFICE OF THE GENERAL COUNSEL

Mr. Chairman and members of the committee, I am pleased to submit this statement setting forth the Department of Defense position on the proposed language changes in the Department of Defense Appropriation Act of 1973. The statement covers all language changes submitted in the President's Budget for FY 1973 on January 12, 1972. (Page references are to the President's Budget).

Each of the language changes for each appropriation heading and the general provisions are considered in the order in which they appear in the President's Budget. But first, I will address the availability of the procurement appropriations.

In each of the appropriation accounts for "Procurement", language has been included to provide for their availability "until expended". As you know prior to FY1971 appropriations available for "Procurement" have been made available for obligation "until expended" i.e. without fiscal year limitation as authorized pursuant to 31 U.S.C. 649(c). In connection with the consideration of the Department of Defense Appropriation Act for 1971 the committee expressed concern that large unobligated balances had accumulated in these appropriations. To remedy that situation the Appropriation Act for 1971 provides that all such funds (prior balances plus those to be provided for FY 1971) will be available until June 30, 1975 for shipbuilding and June 30, 1973 for the other procurement appropriations. We believe that the purposes Congress intended by this action will be accomplished by providing this one time terminal date for all funds provided to the Department of Defense through FY 1971. However, in connection with the FY 1972 the Congress provided that the "Procurement" appropriations would remain available for obligation until June 30, 1974; with the date for shipbuilding being June 30, 1976.

We are asking that the FY 1973 Procurement program be financed with no-year appropriations, which will be kept totally separate both from the older balances which were provided through FY 1971 and those provided in FY 1972. We are faced with difficult and significant administrative effort as a result of the actions taken by the Congress as outlined above. The administrative workload and related presentation and control problems, would be greatly multiplied if the Congress were to provide a succession of multiple-year appropriations. Since we believe that the problem of unobligated balances is under control as a result of the congressional action in FY 1971, and faced with the burden of successive multi-year appropriations, we strongly urge that the appropriation accounts in this year's Act be made available "until expended". Necessary language changes are indicated under each appropriation heading.

The recommended changes for each appropriation heading are set forth below. As in the past the new numbers pertaining to the purchase of passenger-carrying motor vehicles in these accounts reflect the number of such vehicles proposed for purchase by the dollar amounts requested and the changes in such numbers are not considered language changes for the purpose of this statement.

RESERVE PERSONNEL, MARINE CORPS (P. 166)

Entitlements of the Marine Corps platoon leaders class are in no way related to Section 265 of Title 10 United States Code. Accordingly, as an editorial change the words "and for members of the Marine Corps platoon leaders class", have been relocated to correct any erroneous impression to that effect.

AIRCRAFT PROCUREMENT, ARMY (P. 179)

The words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

MISSILE PROCUREMENT, ARMY (P. 180)

The language providing for transfer of funds from "Procurement of Equipment and Missiles, Army, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES, ARMY (P. 181)

The words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

PROCUREMENT OF AMMUNITION, ARMY (P. 182)

The language providing for transfer of funds from "Procurement of Equipment and Missiles, Army, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

OTHER PROCUREMENT, ARMY (P. 183)

The words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

PROCUREMENT OF AIRCRAFT AND MISSILES, NAVY (P. 184)

The language providing for transfer of funds from the Defense stock fund and "Procurement of Aircraft and Missiles, Navy, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

SHIPBUILDING AND CONVERSION, NAVY (P. 185)

The language providing for transfer of funds from "Shipbuilding and Conversion, Navy, 1971/1975" is deleted as no longer necessary. Also,

the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1976".

OTHER PROCUREMENT, NAVY (P. 186)

The language providing for transfer of funds from the Defense stock fund and from "Other Procurement, Navy, 1971/1973" is deleted, as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

PROCUREMENT, MARINE CORPS (P. 188)

The language providing for transfer of funds from "Procurement, Marine Corps, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

AIRCRAFT PROCUREMENT, AIR FORCE (P. 188)

The language providing for transfer of funds from the Air Force stock fund, the Defense stock fund, and "Aircraft Procurement, Air Force, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

MISSILE PROCUREMENT, AIR FORCE (P. 190)

The language providing for transfer of funds from the Defense stock fund and "Missile Procurement, Air Force, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

OTHER PROCUREMENT, AIR FORCE (P. 191)

The language providing for transfer of funds from "Other Procurement, Air Force, 1971/1973" is deleted as no longer necessary. Also, the words

"to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

PROCUREMENT, DEFENSE AGENCIES (P. 192)

The language providing for transfer of funds from "Procurement, Defense Agencies, 1971/1973" is deleted as no longer necessary. Also, the words "to remain available until expended" are used instead of "to remain available for obligation until June 30, 1974".

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY (P. 194)

The language providing for transfer of funds from "Research, Development, Test,and, Evaluation, Army, 1971/1972" is deleted as no longer necessary.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, NAVY (P. 196)

The language providing for transfer of funds from "Research, Development, Test, and, Evaluation, Navy, 1971/1972" is deleted as no longer necessary.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, AIR FORCE (P. 197)

The language providing for transfer of funds from "Research, Development, Test, and, Evaluation, Air Force, 1971/1972" is deleted as no longer necessary.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE AGENCIES (P. 199)

The language providing for transfer of funds from "Research, Development, Test, and, Evaluation, Defense Agencies, 1971/1972" is deleted as no longer necessary.

SECTION 707(a)- DEPENDENTS EDUCATION (P. 232)

The dollar amount in section 707 pertaining to the overseas education of minor dependents of military and civilian personnel is proposed for increase from $152,100,000 to $171,900,000 in the budget. This increase is necessary primarily because of increased teacher pay and increases in the cost of suppliers and other operating expenses. (See in this connection the detailed statement of Dr. Nathan Brodsky, Acting Deputy Assistant Secretary of Defense (Education)).

SECTION 707(f)- CONTRACTS FOR MAINTENANCE (P. 232)

It is proposed that section 707(f) be modified by broadening its application to "maintenance of equipment and facilities" instead of just "maintenance of tools and facilities". This recurring provision now has allowed maintenance contracts for tools or facilities to run for not to exceed a twelve month period, even though such periods overlap the end of the fiscal year. Under prior procedures, all such contracts terminated, at one time and were required to be renewed at the same time, i.e. at the end of the fiscal year thus creating a heavy and concentrated workload in the renewal of these annual contracts at that time. The spreading of the workload has proved beneficial. However, the current authority is limited to tools and facilities, the same procedures could be effectively applied to maintenance of types of personal property other than tools, such as all types of plant equipment as well as office machines. Broadening the coverage to "equipment" would permit this to be done.

SECTION 707(l)- SENIOR ADVISORS IN VIETNAM (P. 232)

Section 707(l) as contained in last year's Department of Defense Appropriation Act is recommended for deletion. That provision related to transportation and per diem for dependents of military personnel assigned

as province or district senior advisors in Vietnam in connection with special and incentive leave at rest and recuperation centers. The authority provided for by that provision specifically expired on March 31, 1972, and therefore is recommended for deletion. In accordance with the recommendation of this committee, legislation has been submitted to the Congress by this Department which has resulted to date in the introduction on November 9, 1971, of H.R. 11936, a bill "To authorize the transportation of dependents of certain military personnel to and from rest and recuperation centers, and for the payment of per diem allowances for such dependents, and for other purposes."

SECTION 707(1) - NATIONAL INDUSTRIAL EQUIPMENT RESERVE (P. 232)

As recommended for amendment to the President's Budget for FY 1973 (House Document 92-267), it is proposed that a new provision be added to section 707 which would authorize Department of Defense to reimburse the General Services Administration for expenses of the National Industrial Equipment Reserve (NIER) incurred pursuant to section 8 of the National Industrial Reserve Act of 1948.

The NIER was created in 1948 for the purpose of providing industrial equipment to expand defense supporting industries in time of national emergency. It was used extensively during the Korean War but only to a very limited degree during the Vietnam conflict due to the overall high level of national production compared to the support required for our military forces. Without the NIER many vital defense supporting industries would be incapable of rapid expansion in an emergency for fulfillment of the needs of defense contractors.

Defense supporting industries are those which do not receive direct defense contracts but upon which defense contractors are dependent for

vitally needed components and equipment. Examples are producers of bearings, electric motors, electronic components and machine tools. Planning for defense supporting producers is conducted by the Bureau of Domestic Commerce of the U.S. Department of Commerce rather than the Department of Defense. In fact, emergency plans call for transfer of the functions which the Secretary of Defense has with respect to the NIER to the agency established for control of National Production in time of emergency.

In 1958 the Department of Defense sponsored a program whereby tools from the NIER are loaned to vocational training institutions. The value of this program to industrial preparedness is the number of skilled machinists that are trained each year. About 90 percent of the trainees who have successfully completed such training have obtained gainful employment in private industry. About 30,000 individuals receive training under this program annually and the Congress maintains a keen interest in it.

At present about 355 school loans are in effect to schools in 44 states, covering some 7,257 items of equipment. In addition, there are 16 loans currently awaiting approval. The tools loaned to schools are still a part of the NIER and, when required, can be withdrawn from the schools to support urgent defense needs. In the meantime the tools are receiving proper maintenance at dispersed locations at no cost to the Government and most importantly they assist in alleviating the critical shortage of skilled machinists.

In view of the importance of the NIER, the Department of Defense proposes, for FY 1973, to have the General Services Administration continue to perform the work on a reimbursable basis since funds were not provided in the GSA budget request for this purpose. This arrangement has been discussed with and is concurred in by the General Services Administration. The current estimate of the minimum FY 1973 cost of administering the NIER, which we

propose to finance through the Operation and Maintenance, Defense Agencies Appropriation, is $1.9 million. Since there are currently no unprogrammed funds in that Appropriation request it may be necessary to transfer funds from other appropriations when a source of funding has been identified.

SECTION 714 - COMMISSARY STORES (P. 233)

It is proposed that section 714 of the general provisions treating with the operation of commissary stores be modified to permit the use of appropriated funds to finance the shipping of commissary store items to Alaska and Hawaii as well as within those States. In the past this recurring provision has permitted the use of appropriated funds for such transportation outside the United States but has prohibited the use of appropriated funds to the place of sale inside the United States. With statehood for Alaska and Hawaii the commissary store customers have had to bear the high cost of transportation. It is considered that for this purpose commissary stores in Alaska and Hawaii are more comparable to those outside the United States than those in the conterminous states. The facts relevant to this proposal are as follows.

Until Alaska and Hawaii became States, appropriated funds supported the cost of transportation of commissary items to Alaska and Hawaii under a recurring provision of the Defense Appropriation Act which authorized appropriated funds to pay for "transportation outside the United States". When Alaska and Hawaii became States, an interpretation was made by the Comptroller General of the United States (Comptroller General Decision, B-138800, Nov. 18, 195 that required the commissary patron to support overseas transportation cost.

Due to the inordinate costs incurred to transport commissary items, as a result of the geographic separation of these States from the continent, it became necessary to provide military personnel stationed in Hawaii and Alaska a compensatory "Cost of Living Allowance (COLA)".

The transportation costs (12% Hawaii-30% Alaska) added to the invoice price of commissary items and therefore reflected in the costs of each item sold is applied equally regardless of the commodity shipped or the actual costs of transportation for individual items or shipments. The percentage add-on is an average factor for the entire transportation costs computed quarterly by the Defense Personnel Support Center (DPSC) who is the Single Commodity Manager for subsistence in DOD.

Approximately 9 million dollars of COLA was paid to military members in Hawaii and Alaska during FY 72 (Hawaii $3.725 million-Alaska $5.225 million). About 80% of COLA is related to the cost of food items ($7.2 million).

DPSC sales and transportation charges for FY 71 were as follows:

Area	Sales	Trans. Costs
Hawaii	$7,111,200	$ 853,344
Alaska	$1,566,451	572,714
TOTAL	$8,677,651	$1,426,058

Commissary store sales during CY 71 were as follows:

Area	Sales
Hawaii	$44,400,000
Alaska	$27,100,000
TOTAL	$71,500,000

Analysis of Commissary Store sales to wholesale receipts provided through DPSC depicts that DPSC is only providing approximately 16% of stocks sold through the commissaries in Hawaii and 6% in Alaska. Basically, this means

that the Commissary Stores are procuring the major portion of their resale stocks from suppliers with sales representatives in those commands, or from stateside suppliers shipping directly at prices based on F. O. B. destination.

A breakout of total commissary sales is approximated below:

Hawaii	(Millions)
DPSC Furnished Sales	$ 7.111
DPSC Transportation Charges	$ .853
Vendor Furnished Sales	$31.565
Est. Vendor Trans. Charges	$ 3.788
Sub-Total	$43.317
2 1/2 % Surcharge	1.083
TOTAL	$44.400

Alaska	
DPSC Furnished Sales	$ 1.567
DPSC Transportation Charges	$ .573
Vendor Furnished Sales	$18.691
Est. Vendor Transportation Charges	$ 5.607
Sub-Total	$26.438
2 1/2% Surcharge	.661
TOTAL	$27.100

COLA in Hawaii related to food costs (80%) is $2.980 million. Transportation charges added to the base invoice approximates $4.130 million. It would

appear that the military member is supporting out-of-pocket $1.150 million per year for transportation costs of food stuffs. COLA in Alaska related to food costs (80%) is $4.180 million. Transportation charges added to the base invoice approximates $5.825 million. It would appear that the military member is supporting out-of-pocket $1.645 million per year for transportation costs of food stuffs in Alaska.

In the event the government assumes the cost of transportation for commissary resale stocks to Hawaii and Alaska, the estimated increase to that segment of the Transportation Budget would approximate $10.8 million per annum.

It is expected that COLA would be reduced in Hawaii and Alaska by approximately $7.2 million if the government assumes the transportation costs. The overall increase to the Services transportation budgets would therefore be approximated, $3.6 million per annum. This would appear to be an equitable charge to appropriated funds in view of the $2.8 million now being charged the patron out-of-pocket above that which is provided by COLA. On a per-capita basis, this added support cost ($3.6 million) would equate to less than $58.00 per service family per year, and if the COLA was increased to compensate for the $2.8 million out-of-pocket expense to the service member, the per-capita increased support costs would only be $12.83 per family, per year.

SECTION 715- PROFICIENCY FLYING (P. 233)

It is proposed that the changes that Congress made last year in section 715, which places certain prohibitions on proficiency flying, be modified. The actions taken by the Department of Defense as a result of last year's congressional actions and the reasons for the proposed revision of section 715 are as follows.

I. ACTIONS TO IMPLEMENT SECTION 715, P.L. 92-204

DoD appropriations for FY 1972 were enacted (P.L. 92-204) on December 18, 1971. Section 715 of the General Provisions of that Act prohibits proficiency flying by members assigned to a (long term) course of instruction of 90 days or more. It also specifies that proficiency flying may not be required of other members except to maintain proficiency in anticipation of their assignment to combat operations. Actions to place these legal requirements in effect are given below.

Long-Term Students - The Military Departments terminated proficiency flying by pilot students not already excused under FY 1971 authority within two weeks after enactment of the legislative prohibition. Approximately 900 pilots in a student status were removed from proficiency flying.

Members' Anticipated Assignment to Combat Operations - To ensure strict compliance with the law the Department adapted the system previously established by the Secretary of Defense for approving total pilot requirements. Under this system, pilot requirements are categorized generally as:

(1) The Core: Pilots required to man today's force structure aircraft, conduct pilot training, and command, manage, or supervise flying-related activities; and

(2) The Supplement: The additional pilots needed in the active establishment primarily to support an expanded force structure at the outset of hostilities.

The "Supplement" portion of the pilot requirements system generally fits the legal criterion of members whose assignment to combat operations can be anticipated. It was therefore established, with some refinements, as the basic method to quantify, control, and manage proficiency flying programs.

Accordingly, on February 7, 1972 the Assistant Secretary of Defense (Manpower and Reserve Affairs), on behalf of the Secretary of Defense, instructed the Military Departments to:

(1) Terminate and prohibit all flying by members assigned to positions not specified to have duties whose performance requires the maintenance of basic flying skills, except as provided in (2) and (3), below.

(2) Permit or require proficiency flying only for those members of the pilot Supplement who have the highest probability of being reassigned to combat operations.

(3) Limit the number of proficiency flying participants to a number equal to the Supplement less any portion attributable to (a) transients (except for the added pipeline needed for contingencies); (b) long-term students; (c) career development; and (d) contingency augmentees for non-combat units, as for example, augmentees for expansion of pilot training activities during partial or full mobilization.

The FY 1972 statutory limitations on proficiency flying became fully effective on May 1, 1972. Significant changes in proficiency flying participation in FY 1972 are:

- Pilots in the grade of Colonel/Captain (O-6) and above are excluded from participation.

- Approximately 4,400 pilots attending long-term courses, are prohibited from participation.

- Total participation is reduced 44% from FY 1971, down 7,000 members, including excusals, in FY 1972 from 16,000 in FY 1971.

II. ACTIONS TO IMPROVE MANAGEMENT OF PROFICIENCY FLYING PROGRAMS

The method discussed in Section I provides a uniform basis for determining and controlling proficiency flying participation. The framework established permits a rational matchup of such participation with the larger demands of force readiness and contingency planning. As such, it provides assurance that the numbers of proficiency flying participants will be effectively controlled.

DoD Directive 1340.4, the Directive governing the proficiency flying program, is under revision. The revision takes account of the Committee's criticism last year of the proficiency flying program.

The Directive is being strengthened. It will incorporate the procedure and policies established by the ASD(M&RA) on February 7, 1972 (Section I preceding). It will more clearly relate the need for proficiency flying participation to Service missions, aircraft types, and the refresher training needs of the individual participants. Additionally, a requirement for program review by OSD is being established to provide an improved basis to better judge proficiency flying requirements and performance.

On May 24, 1972, the ASD (M&RA) established numerical limits on pilot participation in proficiency flying programs.
These limits compared with actual strengths reported for June 30, 1971, are shown below:

PROFICIENCY PILOT PARTICIPATION

	June 30, 1971	CY 1972*
Army	5,327	2,600
Navy	3,791	1,900
Marine Corps	876	600
Air Force	6,000	3,850
Total	15,994	8,950

*Pending enactment of FY 1973 DoD Appropriations

III. PROPOSED REVISION OF FY 1972 STATUTORY PROVISIONS

DoD has taken the actions necessary to implement the FY 1972 statutory provisions governing proficiency flying. The Actions taken reflect the spirit as well as the full intent of the Congress. Nonetheless, the Department's position is that the provisions of the law are (1) inequitable as between students and non-students; and (2) unduly restrictive because they prevent members who will be reassigned to other essential flight operations from maintaining their basic flying skills.

The legal distinction between pilots attending school and those in other non-flying assignments does not appear reasonable. Both categories are resources available for reassignment to combat operations. If the personnel readiness of these resources is foreclosed force readiness and responsiveness are inevitably degraded. Ultimately, additional time and expense could be required for refresher training of these rated officer students.

The Department urges the House Appropriations Committee to approve the Department's proposed revision of Section 715 which deletes this prohibition for the FY 1973 appropriations. The Services anticipate that no more than 700 student participants would be restored to proficiency flying status in FY 1973 if the revision proposed is approved.

The Department further recommends that the permissive provisions of Section 715 be revised to include members whose reassignment to other essential flight operations can be anticipated.

The FY 1972 Act overlooks the equally essential need for maintaining flight proficiency of those rated members who will augment activities which support combat operations. Such augmentees include instructor pilots for the training base, pilots to staff operational headquarters for sustained flight operations, and pilots for the personnel pipeline to compensate for turbulence accompanying the contingency.

The Department of Defense strongly recommends that the Committee correct this apparent incongruity. If approved the Department estimates that about 3,500 additional pilots would again participate in proficiency flying programs in FY 1973.

SECTION 730- CONGRESSIONAL LIAISON ACTIVITIES (P. 234)

The dollar amount in section 730 pertaining to the limitation on congressional liaison activities of the Department of Defense is proposed for increase from $1,150,000 to $1,300,000 in the budget, in order to fund pay increases.

SECTION 734 - ADVERTISING COSTS (P. 234)

The fourth exception to the prohibition in section 734 on using appropriated funds for paying the costs of advertising of a defense contractor is proposed for deletion as no longer necessary. This exception related to the costs of participation in the United States International Aeronautical Exposition. The actions taken by the Department of Defense in implementation of this provision for FY 1972 are reflected in the following documents:

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

MEMORANDUM FOR: Assistant Secretary of the Army (I&L)
Assistant Secretary of the Army (FM)
Assistant Secretary of the Navy (I&L)
Assistant Secretary of the Navy (FM)
Assistant Secretary of the Air Force (I&L)
Assistant Secretary of the Air Force (FM)
Director, Defense Supply Agency
Director, Defense Contract Audit Agency

SUBJECT: Allowance of Exposition Costs for Defense Contractors Who Participate in the United States International Aeronautical Exposition (TRANSPO)

The attached instruction establishes procedures to be followed in implementing Section 734 of the 1972 Department of Defense Appropriation Act. It is contemplated that only a limited number of defense contractors will participate in the TRANSPO Exposition and publication of detailed instructions in a Defense Procurement Circular is, therefore, not appropriate. A notice has been prepared for inclusion in a DPC, however, to alert contractors and DOD personnel who may be affected. A copy of this is also attached.

Provision should be made for furnishing copies of the attached instruction to personnel within your organization who audit or administer contracts of contractors who participate in the TRANSPO Exposition and desire to have the costs allowed on defense contracts. Copies should also be furnished to appropriate budget, accounting and disbursing officers.

As indicated in the attached DPC item and the instructions, contractors will be expected to initiate action for cost allowance. Copies of the instruction are to be furnished to such contractors by the cognizant administrative contracting officer.

As the attachments indicate it will be necessary to allow contractors to recover TRANSPO costs on existing contracts in order to carry out the intent of the legislation. This has been accomplished by incorporating a provision in the instructions which amends the cost principle on advertising (15-205.1) with retroactive application to existing contracts of those defense contractors for which TRANSPO costs have been approved.

Signed

ROBERT C. MOOT
Assistant Secretary of Defense
(Comptroller)

[Signed

BARRY J. SHILLITO
Assistant Secretary of Defense
(Installations & Logistics)

OFFICE OF THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

Amendment of ASPR 15-205.1, Advertising Costs, to Provide for Allowance of TRANSPO Costs and Instructions for Implementation of Section 734, PL 92-204

To implement Section 734 of the 1972 Department of Defense Appropriation Act which provides for allowance of TRANSPO participation costs, the provisions of ASPR 15-205.1(b) are hereby revised as follows to incorporate the underlined provision:

(b) (CWAS) The only advertising costs allowable are those which are solely for (i) recruitment of personnel required for the performance by the contractor of obligations arising under the contract, when considered in conjunction with all other recruitment costs, as set forth in 15-205.33, (ii) the procurement of scarce items for the performance of the contract, (iii) the disposal of scrap or surplus materials acquired in the performance of the contract, or (iv) costs of participation in the United States International Aeronautical Exposition (TRANSPO) subject to the limitations established by instruction of the Assistant Secretary of Defense (Installations and Logistics). Costs of this nature, if incurred for more than one defense contract or for both defense work and other work of the contractor, are allowable to the extent that the principles in 15-201.3, 15-201.4, and 15-203 are observed.

The foregoing exemption number (iv) shall be applicable, retroactively, to existing contracts to the extent provided for in these instructions and without further revision to such contracts. No adjustments will be made to contract target and ceiling prices, estimated cost and fee, or other contract provisions as a result of this change in cost allowance. Contractors have been requested by the Government to participate in the TRANSPO Exposition and their compliance with that request constitutes the consideration for this action. When firm-fixed price contracts are modified to add new work, the exposition costs allocable to the work covered by the contract modification will be allowed in the same manner as provided for under New Contracts.

New Contracts

Cost or price negotiations for new contracts which are completed on or after the effective date of Defense Procurement Circular 97, dated February 15, 1972, but not later than July 31, 1972, will include allocable TRANSPO costs provided such costs are otherwise allowable and subject to the following Provisions for Allowance:

Provisions for Allowance

1. On or before October 1, 1972 the contractor shall submit to the administrative contracting officer, a statement of the amounts of costs incurred during the period January 1, 1972 through July 31, 1972 as a result of his participation in the United States International Aeronautical Exposition (TRANSPO) together with a summary of the amount that is allocable to all DOD contracts. Amounts allocable to firm-fixed price contracts shall not be included in this summary except when included in the contract prices pursuant to the provisions above concerning new contracts. Amounts reported should show totals chargeable against the funds of each fiscal year appropriation together with the applicable accounting classification. Costs which are unallowable pursuant to other provisions of ASPR Section XV or because of special contract provisions should not be included in the amounts reported.

2. The Assistant Secretaries (I&L) of each of the Military Departments and the Deputy Director Defense Supply Agency shall determine the aggregate dollar value (by fiscal year) of all TRANSPO costs allocable to DOD contracts that have been submitted to and approved by the administrative contracting officers in their respective organizations and shall advise the Assistant Secretary of Defense (I&L) of this total dollar figure by November 1, 1972.

3. The Assistant Secretary of Defense (I&L) shall determine the sum of all amounts reported and will publish instructions stating the portion of such reported costs that may be allowed. All reported costs otherwise allowable, reasonable and allocable will be allowed for reimbursement unless the total exceeds the legislative limit of $1,250,000 in which event a pro rata share will be allowed for each contractor.

4. Costs allowed in accordance with the ASD(I&L) instructions shall be allowed through suitable adjustment to the contractors' overhead accounts. Individual contracts will not be revised to provide FY 72 funds, however, the ASD(Comptroller) and the Assistant Secretaries (FM) for each of the Military Departments are authorized to make appropriate adjustments of funds at the appropriation level to replace those of other years that are used in reimbursing authorized exposition costs.

5. Except as provided herein, no costs incurred by contractors as a result of participation in the United States International Aeronautical Exposition shall be allowed.

ROBERT C. MOOT
Assistant Secretary of Defense
(Comptroller)

BARRY J. SHILLITO
Assistant Secretary of Defense
(Installations & Logistics)

15 FEBRUARY 1972 DEFENSE PROCUREMENT CIRCULAR #97

ITEM VIII--1972 Department of Defense Appropriations Act

The 1972 Department of Defense Appropriations Act includes in Section 734 the following language:

"No part of the funds appropriated herein shall be available for paying the costs of advertising by any defense contractor, except advertising for which payment is made from profits, and such advertising shall not be considered a part of any defense contract cost. The prohibition contained in this section shall not apply with respect to advertising conducted by any such contractor, in compliance with regulations which shall be promulgated by the Secretary of Defense, solely for....., or (4) costs (not to exceed an aggregate total for all contracts of $1,250,000) of participation in the United States International Aeronautical Exposition." (Underscoring added.)

To carry out the intent of this legislation, costs incurred prior to 1 August 1972 by Defense contractors as a result of participation in the United States International Aeronautical Exposition (TRANSPO) will be allowed retroactively on existing contracts in accordance with special instructions established by the Office of the Secretary of Defense.

New contracts or amendments to contracts for which negotiations are completed on or after the effective date of this circular, but not later than July 31, 1972, may provide for allowance of TRANSPO participation costs provided the contractor includes the amount of such costs in his submission of data as described below.

Because of the ceiling limitation established by the legislation, it will be necessary to determine the total costs allocable to Defense contracts as a result of contractors' participation in the exposition. If the aggregate of such costs exceeds the ceiling, a reduction in each contractor's allowance will be necessary.

Contractors will be required to submit cost data to the Department of Defense no later than October 1, 1972, if they wish to have their exposition costs considered for allowance. No requests by contractors for allowance of TRANSPO costs will be considered after this date.

Instructions for submitting exposition cost data, and procedures to be followed, are being furnished to each of the Military Departments, the Defense Supply Agency, and the Defense Contract Audit Agency for transmittal to personnel within their organizations who may be affected.

Contractors who wish to have their exposition costs considered for allowance should immediately notify their Administrative Contracting Officer and request a copy of the instructions.

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SECTION 736- TRANSFER OF APPROPRIATIONS (P. 234)

As in past years section 736 would provide authority to transfer appropriations or funds for military functions between such appropriations or funds. It is requested that the dollar limitation on the use of this authority be increased from $750,000,000 to $1,000,000,000.

During the past three years the Defense budget has been significantly reduced, to the point that the Department's flexibility to meet unforeseen requirements has been severely limited. Additionally, (1) the number of separate appropriations accounts have been increased, e.g. Army procurement accounts and (2) the period of the availability of both procurement and RDT&E accounts have been limited. The full effect of such actions is much greater than the individual program changes required by authorization and appropriation action. This makes it essential that additional flexibility be approved to the Department of Defense to transfer funds between appropriations to meet emergencies and the most urgent needs of national defense within the appropriations provided by the Congress. Present transfer authority totals $750 million-less than 1% of the total funds available.

The unpredictability inherent in the current world situation makes it essential that the Department of Defense be able to react to changes necessary to provide for the strongest possible Defense posture within resources approved by the President and the Congress. To the extent there are Congressional reductions in the Authorization Bill it also reduces our flexibility. Some of this flexibility can and should be restored by authorizing increased transfer authority between Defense appropriations.

Additionally, the increase proposed would facilitate adoption and expansion of a program now being developed to convert selected jobs held by military personnel to civilian incumbency (direct-hire or contract services). The program is a further initiative towards achieving an all-volunteer force and

the Department plans to begin it during the last half of FY 1973. The need for transfer authority for this purpose was recognized by the Comptroller General in his report (B-146890) to the Congress dated March 20, 1972 on the "Extensive Use of Military Personnel in Civilian-Type Positions".

The Congress, of course, would be immediately advised of the use of this authority as is currently provided by section 736.

SECTION 738- MILITARY ASSISTANCE, THAILAND (P. 234)

Provision for military assistance for Thailand is included in the estimates for the Foreign Assistance and Related Program Appropriation Act for FY 1973 and is not recommended for inclusion in the Department of Defense budget for military functions. Accordingly reference to Thailand in section 738 is deleted as no longer necessary.

SECTION 743- SAFEGUARD CONSTRUCTION (P. 235)

It is proposed that section 743 be deleted in its entirety as no longer necessary since funds for community assistance in connection with the impact of Safeguard construction is being requested in the Military Construction Appropriation Act.

SECTION 744- MANDATORY QUOTA (P. 235)

It is proposed that section 744 be deleted in its entirety as no longer necessary since the system of mandatory quota based on mental categories is no longer in effect.

Overseas Dependents Schools

STATEMENT OF DR. NATHAN BRODSKY, ACTING DEPUTY ASSISTANT SECRETARY OF DEFENSE (EDUCATION)

ACCOMPANIED BY:

DR. ANTHONY CARDINALE, DIRECTOR OF DEPENDENTS EDUCATION, ODASD(E)

JAMES CARNAHAN, OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

DR. RONALD A. DOWNING, CHIEF OF DEPENDENTS SCHOOLS, DEPARTMENT OF THE ARMY

DR. CLARENCE K. ANDERSON, HEAD OF DEPENDENTS SCHOOLS, DEPARTMENT OF THE NAVY

ARLEN STAFFORD, CHIEF OF DEPENDENT SCHOOLS, DEPARTMENT OF THE AIR FORCE

1972 APPROPRIATION AND 1973 BUDGET REQUEST

Chairman Ellender. The next item to be considered is the request for the overseas dependents schools program for which the fiscal year 1973 request is $172.7 million, as compared with $153.1 million provided for fiscal year 1972.

The request is contained in the following appropriations:

'Operation and maintenance, Army," $111.4 million; and "Military personnel, Army," $0.1 million, for a total of $111.5 million.

For the Navy, it is "Operation and maintenance, Navy," $19 million; and "Military personnel, Navy," $0.13 million, for a total of $19.013 million.

For the Air Force, it is "Operation and maintenance, Air Force," $41.5 million; and "Military personnel, Air Force," $0.7 million, for a total of $42.2 million.

I will include in the record a summary tabulation for the program for fiscal years 1971, 1972, and 1973.

(The information follows:)

Overseas Dependents Education	($ in millions) FY 1971	FY 1972	FY 1973
Administrative Costs	5.1	6.0	6.2
a. Salaries of Personnel above school level	4.3	5.1	5.3
b. Personnel Benefits	.3	.4	.4
c. Travel	.4	.4	.4
d. Supplies	.1	.1	.1
Education Costs	87.1	95.8	107.8
a. Salaries of Teachers	57.7	63.0	67.9
b. Salaries of Principals	4.4	4.4	4.5
c. Salaries of Clerical Personnel	3.4	5.0	6.5
d. Salaries of Other Employees	5.7	6.3	7.0
e. Personnel Benefits	5.8	6.5	7.0
f. Instructional supplies, textbooks and library books, equipment	8.0	8.3	12.7
g. Innovations and Research	.3	.4	.4
h. Summer School Teachers Salaries	.5	.5	.5
i. Other Costs (compensation for extra school activities, TDY travel, miscellaneous)	1.3	1.3	1.3
Support Costs	21.2	24.8	29.9
a. Salaries of Support Personnel	1.1	.8	.7
b. Custodial Services at School Facilities	4.8	6.4	7.4
c. Contractual Services - Other	2.7	3.4	6.0
d. Transportation	8.9	10.0	11.1
e. Rents and Utilities	3.4	3.9	4.3
f. Miscellaneous Costs	.3	.3	.4
Subtotal Costs of DOD Schools	113.4	126.6	143.9
Less Reimbursements for Non-DOD Students	6.2	6.8	7.6
Net Costs of DOD Schools	107.2	119.8	136.3
(Estimate Number of Pupils in DOD Schools)	157,291	153,867	152,088
(Cost Per Pupil - Dollars)	682	779	896
Costs Unique to DOD Schools	12.2	13.5	14.9
a. Host National Teachers	2.4	3.0	3.2
b. Costs of Living and Quarters Allowance, Foreign Post Differentials	4.4	4.7	5.3
c. PCS Travel of Civilian Personnel	4.1	4.0	4.2
d. Cost of Dormitories (Room & Board, Monitors)	1.3	1.4	1.6
e. Inter-Curricular Programs		.4	.6
Panama Canal Zone Company Schools Tuition Fees	9.9	10.6	11.5
Tuition Fees for Other Tuition Fee Schools	8.2	8.8	9.2
Additional Supplemental & Amendment for Pay		.4	.8
Total Costs DOD and Tuition Schools	137.5 1/	153.1 2/	172.7
(Estimate Number of Pupils Including Tuition)	175,249	171,527	169,542
(Cost per Pupil - Dollars)	785	893	1,019

1/ FY 1971 Congressional ceiling, $136.7M plus cost of January 1970 and 1971 Class Act pay raises, $1.3M, equal revised ceiling of $138.0M.

2/ FY 1972 Congressional ceiling, $152.1M plus estimated cost of January 1971 Classified Act pay raises, $.6M, equal estimated revised ceiling of $152.7M.

PREPARED STATEMENT

Chairman ELLENDER. The principal witness will be Dr. Nathan Brodsky, Acting Deputy Assistant Secretary of Defense for Education.

You may proceed.

Dr. BRODSKY. I am accompanied by Dr. Cardinale and by representatives of the military services shown on the witness list.

I can read the statement or submit it and summarize it.

Chairman ELLENDER. You may submit it for the record and summarize it.

(The statement follows:)

I am Nathan Brodsky, Acting Deputy Assistant Secretary of Defense (Education). I am pleased to appear before this Committee to discuss the Department of Defense Overseas Dependents Schools Program.

Overseas Dependents Schools have been operating since October 1946, when schools were first opened in Germany.

In 25 years the Overseas Dependents Schools have grown into a system that spans three continents. Today, there are more than 152,000 pupils in DoD Schools, and 8000 teachers and other professional personnel staffing 294 schools in 191 different locations in 27 countries.

It is essential that we maintain the quality of our overseas dependents schools, particularly as we seek to make the military service more attractive. Consequently, we are continuing to seek ways of improving the curriculum, teacher selection, facilities and teaching methods. The following are some steps that are being taken:

—a review of the entire basic world-wide testing program is being conducted.
—our program offerings to students in the area of vocational education are being increased.
—new teaching concepts are being introduced in all three geographical areas.
—eleven school construction projects have been included in the FY 1973 MCP.
—our drug abuse education program is continuing.

During the Fall of 1969 and 1970, all students in the DoD Dependents Schools, grades kindergarten thru eleven, were tested in reading, reading readiness and other achievement areas. Results from both testing cycles have provided us with an overview of our educational program. We want to continue with our basic testing program, but want to develop one that can be used more effectively by teachers and administrators in counseling students at all grade levels as well. We plan to complete the review and revision of our testing program by December 31, 1972.

We have collected information from our high schools which indicate that only about 55% of our 1971 graduates plan to enter college. In order to properly prepare those students who will either terminate their education upon graduation or go on to vocational programs, we must increase the number of vocational subjects being offered, and bring our career education program in line with the better school systems in the United States. The North Central Association of Colleges and Secondary Schools, the Association that accredits our 59 high schools, has highlighted the need for our dependents schools to offer more vocational subjects.

There are a number of examples of improved teaching in our school system. Special teacher training institutes have contributed to improved teaching methods. During the summer of 1971 three institutes were held for teachers and administrators in the overseas areas to introduce our personnel to the latest teaching methods involving math and science and drug abuse education. The University of Hawaii conducted a six week institute in Japan in the area of Environmental Biology, Physical Science, Geography, Mathematics and Geometry. Florida State University conducted a four weeks institute in Munich, Germany in the field of Intermediate Science. Adelphi University of Garden City, New York, conducted a four weeks institute in Wiesbaden, Germany, in drug education for approximately 70 teachers and administrators and 20 high school students.

As a result of our recent review of school facilities, we have included eleven school construction projects in the FY 1973 Military Construction Program. The projects are located at Hanau, Kaiserslautern, Hahn, Ramstein, Rhein Main, all in Germany; Guantanamo Bay, Cuba; Sigonella, Sicily; Aviano, Italy; Soesterberg, Netherlands; Clark Air Force Base, the Philippines; and Incirlik, Turkey. Our review of school facilities will continue since we must utilize buildings that are safe and conducive to learning. Many of our existing buildings were not constructed as school facilities.

Perhaps one of the greatest concerns of stateside school administrators is the use of drugs by high school and elementary school students. Our schools are no exception. We do believe, however, that the rate of drug use in our high schools is declining, partly due to the effectiveness of our Teen Counseling program.

As I mentioned above, Adelphi University conducted a four week drug education institute in Germany. Plans are underway to conduct a similar drug education institute in the Pacific Area during the summer of 1972.

The European and Pacific Areas have recently appointed drug education coordinators in their area offices, and one full time drug education specialist in each of eight district and two sub-district offices. These twelve individuals will coordinate the drug education activities of all teachers and administrators who have been and will be trained by Adelphi University as well as lead the preventive education drug program which is presented to all students, K–12, by the teachers in these two areas. At the six school locations in the Atlantic Area of our operation, the drug preventive education program is coordinated by school nurses.

The following list of the budget increases over FY 1972 was provided by Secretary Moot during his appearance before this Committee:

Fiscal year 1972 estimate	$153.1
Fiscal year 1973 increases:	
1. Pay raise for Public Law 86–91 employees	4.2
2. Within-grade pay increases	2.1
3. Estimated increases related to personnel salaries (benefits, summer school, compensation for extra school activities, cost of living and quarters allowance)	1.0
4. Increased staffing in Europe and the Atlantic offset by reduced personnel from student enrollment decreases in the Pacific	.1
5. Estimated increase in tuition-fees schools	1.3
6. Full year cost of cocurricular (sports, music) and paraprofessional school aides programs begun in fiscal year 1972	1.4
7. Program improvements (facilities, vocational education, educational supplies and equipment) in Europe	5.8
8. Other increases (supplies and equipment, $200,000; transportation, $1,100,000; rents and utilities, $400,000; custodial services, $700,000; real property maintenance, $400,000; PCS, $200,000; miscellaneous, $300,000; and additional supplemental and amendment for pay, $400,000	3.7
Fiscal year 1973 request	172.7

Included in the DoD budget for FY 1973 is $6.3 million to provide for a teacher salary increase which was developed according to the provisions of Public Law 89–391, and within grade increases for Classification Act employees.

To allow for the estimated increases related to personnel salaries, such as for teachers of summer school, compensation for extra school activities, cost of living, and quarters allowances an amount of $1.0 million is required.

We have estimated that the Pacific Area will have a decrease of approximately 57 personnel. On the other hand it is estimated that the total personnel increases for Europe and the Atlatc Area will total 66, thus we have programmed $.1 million for the additional 9 personnel.

An amount of $1.3 million is required to pay the increased cost of tuition for sending students to schools in those locations where the Department of Defense does not operate any schools.

An amount of $1.4 is required to fund the full year cost of the co-curricular and para-professional program which Congress authorized in FY 1972.

We have budgeted an estimated amount of $5.8 million to improve the vocational educational program in the European Area. This amount will provide for improved facilities, supplies, personnel, and equipment needed for the program.

To compensate for other increases related to supplies and equipment, trans-

portation, rent and utilities, maintenance, supplemental pay, etc., an amount of $3.9 million has been budgeted.

Our estimate for total student enrollment in fiscal year 1973 is 169,542, broken down as follows:

DOD-operated schools (Kindergarten–12)	152,088
Canal Zone Tuition Schools	7,500
Tuition Fee Schools	9,954
Total	169,542

The FY 1973 request will result in an average per pupil cost (excluding our unique school costs and tuition-fee cost) of $896.

Based upon information collected from the United States Office of Education, and the National Education Association, it is estimated that the per pupil cost in the United States for the 1971–72 school year will amount to $929.

We believe that the requested resources will provide a sound educational program for the dependents of military and civilian personnel stationed overseas.

I will be happy to answer any questions the Committee may have.

VOCATIONAL AND OCCUPATIONAL EDUCATION

Dr. BRODSKY. The major thing I would like to bring to your attention, Mr. Chairman, is that, like every school system, we have to keep improving it in order to keep it viable to meet students' needs. One of the biggest problems we face in overseas dependent schools right now is to provide vocational and career education for our students in the schools.

We have proceeded for a long time on the basis that most of our students go on to college. When we took a survey we found that was true of perhaps half of our students and the others were either going into vocational schools or were going into the world of work. So we are directing a major part of our attention now to the provision of vocational and occupational education.

INCREASES

In my statement, beginning with the bottom of page 5, we explain the increases in the request and, if I may, I would like to concentrate on these.

TEACHER AND CLASSIFIED EMPLOYEE SALARIES

Included in the DOD budget for fiscal year 1973 is $6.3 million to provide for a teacher salary increase which was developed according to the provisions of Public Law 89–391, and within grade increases for Classification Act employees.

Chairman ELLENDER. What is the nature of this provision of law that provides for these mandatory pay increases for teachers?

Dr. CARDINALE. In Public Law 89–391, there is a provision which states that the salaries for teachers overseas will be based on the average of the range of rates of school systems here in the United States that have 100,000 population and over. There are 182 school systems with a population of 100,000 and over and we take the salary schedule and use that by adding them altogether and finding the mean for the beginning and ending salaries.

TEACHER FRINGE BENEFITS

Chairman ELLENDER. What extra benefits do these teachers receive who go abroad?

Dr. CARDINALE. A teacher, if hired in the United States, will receive a basic salary published in the salary schedules, free Government quarters or a quarter's allowance and transportation both ways paid by the U.S. Government. In the overseas areas they get hospitalization the same as all Federal employees if they elect to do this, and they are entitled to other things.

TEACHER CONTRIBUTIONS

Chairman ELLENDER. What contributions do they make?

Dr. CARDINALE. They make the same contributions, whatever the percentage might be for the health plan and civil service retirement which they participate in; the individuals pay 7 percent and the Federal Government pays the other 7 percent for the retirement.

STANDARDS PUBLISHED BY STATE DEPARTMENT FOR OVERSEA CIVIL EMPLOYEES

Chairman ELLENDER. How do you determine the amount to be paid for quarters? Does it vary in each country?

Dr. CARDINALE. It varies by country and grade level, according to the standards published by the Department of State for all civil service employees in the overseas areas.

STUDENT SOURCES

Chairman ELLENDER. The students are the dependents of service personnel?

Dr. BRODSKY. Yes, sir.

Chairman ELLENDER. How about dependents of civilian employees?

Dr. BRODSKY. There are currently 152,088 students in the schools which are operated by DOD. Additionally, 9,954 going to tuition fee schools and 7,500 in the Canal Zone for whom the tuition is paid.

The number of non-DOD children coming from Federal agencies attending schools is 6,600. The remainder are DOD.

REIMBURSEMENTS FROM OTHER DEPARTMENTS

Chairman ELLENDER. The other departments reimburse the Department of Defense?

Dr. BRODSKY. That is right, sir.

Chairman ELLENDER. This request covers expenses solely for the Defense Department?

Dr. BRODSKY. Yes, sir.

Chairman ELLENDER. To that you add whatever you obtain from——

Dr. BRODSKY. Reimbursement.

Chairman ELLENDER. By way of compensation from the civilian departments of Government?

Dr. BRODSKY. Right, sir.

Chairman ELLENDER. Is the money paid directly to you and do you distribute it, or does it go to the Treasury and then get appropriation?

Dr. BRODSKY. The money is paid directly to the schools and not from the Treasury.

Dr. CARDINALE. The moneys that are collected from the State Department for the children of State Department employees, and other private citizens that might be residing overseas and using our schools, these funds are collected and put into an account administered by local finance officers and then these moneys go back into the appropriation supporting the operation of the dependent schools. In essence, they are paying their way through the program.

Chairman ELLENDER. In other words, the different departments receive a direct appropriation the same as you do here?

Dr. CARDINALE. That is right, sir; in the case of the State Department, though, the individual received an educational allowance that is paid to him and then when he enrolls his child in one of our dependent schools he pays on a quarterly basis the total tuition approved for the particular geographical area.

PAYMENT FOR SERVICE DEPENDENTS ATTENDING OTHER SCHOOLS

Chairman ELLENDER. Are there any cases in which the children of people in the armed services go to a school, let us say, that is maintained by the State Department?

Dr. CARDINALE. We have approximately 3,000-plus in those areas where we don't have a dependent school.

Chairman ELLENDER. You do that on a reimbursable basis?

Dr. CARDINALE. We pay that school; yes, sir.

CANAL ZONE SCHOOLS

Chairman ELLENDER. Will you give us some information on the Canal Zone schools? I understand that they are very much more expensive than the others.

Dr. CARDINALE. That is right, sir.

Chairman ELLENDER. Can you tell us the reason for that?

Dr. CARDINALE. In the Canal Zone, of course this is an instrumentality of the United States and the teachers there receive salaries and allowance that are comparable to the teachers here in the District of Columbia. The Canal Zone follows basically the procedures established here in the District of Columbia. We have 7,500 students attending Canal Zone schools.

AVERAGE PER-PUPIL COST

The average per pupil cost is a little over $1,000 per child.

Chairman ELLENDER. How does that amount per pupil compare with other areas?

Dr. CARDINALE. That $1,000 could be considered high in some areas.

In our program for fiscal year 1973, the per pupil cost is $896. But we have no control over the Canal Zone school system. The 7,500 students we have represent about 64 percent of the Canal Zone school system.

TEACHER SALARIES

Chairman ELLENDER. Are the teachers in the Canal Zone paid extra amounts, the same as the teachers in Europe, for example?

Mr. CARDINALE. Their salary schedule is based upon the Washington, D.C., school system, and then there is this situation——

Chairman ELLENDER. I was referring to extra benefits.

Dr. CARDINALE. They don't receive those benefits, but the only thing the Canal teacher gets, as I understand it, is about a 15-percent differential in living, tropical differential.

Chairman ELLENDER. That is the only difference?

Mr. CARDINALE. To my knowledge; yes, sir.

Chairman ELLENDER. Do you have anything, Senator Young?

BUDGET REQUEST

ALLOCATIONS TEACHERS SALARIES

Senator YOUNG. What is your total amount for teachers' salaries? I don't think I have it.

Dr. CARDINALE. Salaries for teachers for fiscal year 1973, is estimated to be $67.9 million.

TRANSPORTATION

Senator YOUNG. How much for transportation?

Dr. CARDINALE. Transportation is $4.2 million.

Senator YOUNG. What mode of transportation do you use?

Dr. CARDINALE. Wherever possible, the teachers recruited here in the States must agree to go over on an aircraft. We are able to use the military rate on commercial airlines, and we ship our teachers over and bring them back.

Senator YOUNG. Do they travel first class?

Dr. CARDINALE. No, sir; tourist class or economy class.

Senator YOUNG. You get an official rate?

Dr. CARDINALE. Yes; the same rate for a military person traveling on a commercial airline under a Government contract.

PROGRAM EUROPEAN PERSONNEL INCREASE AND REDUCED OVERSEA MILITARY PERSONNEL

Chairman ELLENDER. There have been military personnel reductions in some parts of the world, where you do have schools. Why is it, in view of that, you are asking for 66 more personnel?

Dr. CARDINALE. Well, sir, I believe we have a reduction of about 56 people scheduled for the Pacific area and then we have some to add in the European area, but when you balance it out, we are asking for a net total of nine people.

Chairman ELLENDER. I wonder why you need that increase in Europe?

Dr. CARDINALE. We have with us Dr. Downing, Chief of the Army Dependents Schools; perhaps he can answer.

Dr. DOWNING. Yes, part of this, Mr. Chairman, is the result of paraprofessionals authorized last year by the Congress. Congress author-

ized us to employ paraprofessionals but it was to be implemented only at midyear, so this year we employed 167 and for the next year we can get full implementation, about 332, so it would take care of part of that increase. It is offset by a reduction in the Pacific area.

Senator YOUNG. Is there an increase in percentage of dependents in the European theater?

Dr. DOWNING. I don't know, Mr. Young; there is an increase in percentage, but there is an increase in numbers of students. This year we programed 112,950 students and next year 114,500, and right now we have 117,000 onboard.

Senator YOUNG. You refer to the children of both servicemen and civilians?

Dr. DOWNING. Yes, sir.

STUDENTS ATTENDING TUITION FEE SCHOOLS

Chairman ELLENDER. Why do you pay the tuition in some instances? What is the main reason?

Dr. CARDINALE. It is because, in some locations, we do not operate dependents schools, like South America where we have no such schools. So the children go to the local schools available to them.

Chairman ELLENDER. Does that pertain to the dependents of military personnel as well as civilians?

Dr. CARDINALE. Civilians, yes; both military and civilians, if these individuals are on active duty and stationed in those countries.

Chairman ELLENDER. How does the per capita cost compare with what we pay?

Dr. CARDINALE. In these tuition fee schools, it ranges all the way from $300 to $1,000 in the Canal Zone. Some schools in South America might run as high as $1,400 per child.

Chairman ELLENDER. Is that preparatory schools?

Dr. CARDINALE. No, sir. Grades kindergarten through 12th grade. We do not pay for any junior college work other than the Canal Zone. The laws of the Canal Zone require that we reimburse them for junior college.

VOCATIONAL EDUCATION

Chairman ELLENDER. I notice you provide for vocational education. That will add to the total cost in 1973.

Dr. BRODSKY. It will; yes, sir. We have a budget request here for $5.8 million to include vocational and education programs in Europe.

Chairman ELLENDER. Will those schools operate in connection with high schools?

Dr. CARDINALE. Yes, sir. This would be an offering that we would make in our high schools. We have 59 high schools and this would be a part of their curriculum.

We have a program now, but we find it is not meeting our needs. As Dr. Brodsky mentioned, only about half of our youngsters do not go on to higher education.

STUDENTS ATTENDING TUITION FEE SCHOOLS

Chairman ELLENDER. Would you tell us the number of pupils in the total program for whom you pay tuition?

Dr. CARDINALE. There are 9,954 that we pay tuition for, and that excludes the Canal Zone. There we have 7,500.

Chairman ELLENDER. Are these 9,954 primarily in South and Central America?

Dr. CARDINALE. No; these would be scattered, sir, all over the world.

Chairman ELLENDER. I know, but I mean the bulk of them.

Dr. CARDINALE. I don't think so. Most, I believe, would be in the Far East and next is the European area and then the Atlantic area which would include South America area.

Chairman ELLENDER. Is there anything else, Senator Young?

Senator YOUNG. No; thank you.

Chairman ELLENDER. Is there anything else you want to testify to?

Dr. BRODSKY. No.

Chairman ELLENDER. Your full statement has been put in the record.

Dr. BRODSKY. Thank you.

Retired Pay, Defense

STATEMENT OF LEROY J. SPENCE, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (MILITARY PERSONNEL POLICY)

ACCOMPANIED BY:

COL. JOHN H. BOYD, U.S. AIR FORCE, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (MILITARY PERSONNEL POLICY)

CARL M. DETWYLER, OFFICE OF THE DEPUTY ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER) (MILITARY PERSONNEL DIRECTORATE)

BUDGET REQUEST

Chairman Ellender. Next is "Retired pay, Defense," for which the fiscal year 1973 request is $4,358,684,000, as compared with the amount provided for fiscal year 1972 of $3,931,446,000, which includes $33,684,000 for the January 1, 1972, pay increase.

PROGRAM AND FINANCING

At this point in the record there will appear certain program and financing information from the justifications.

(The information follows:)

RETIRED PAY, DEFENSE

PROGRAM AND FINANCING

[In thousands of dollars]

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Program by activities:			
1. Nondisability	2,463,980	2,903,552	3,255,436
2. Temporary disability	69,808	84,406	100,915
3. Permanent disability	495,357	554,161	605,695
4. Fleet reserve	348,124	376,089	381,594
5. Survivors' benefits	11,730	13,238	15,044
Total obligations (object class 13.0)	3,388,999	3,931,446	4,358,684
Financing: Unobligated balance lapsing	2,033		
Budget authority	3,391,032	3,931,446	4,358,684
Budget authority:			
Appropriation	3,391,032	3,777,134	4,325,000
Proposed supplemental for military pay act increases		1,766	
Proposed supplemental for increased retired pay costs		148,100	
January 1972 pay increase supplemental/amendment		4,446	33,684

Note: The amounts shown as January 1972 pay increase supplemental/amendment are not distributed to each individual appropriation in the fiscal year 1973 President's budget, but are reflected as a 1-line defense-wide contingency amount. The amounts shown above are estimates, pending final determination of the amounts to be requested when supplemental and amended estimates are formally transmitted.

APPROPRIATION COMPONENTS

Chairman ELLENDER. The principal witness will be Mr. LeRoy J. Spence of the Office of the Deputy Assistant Secretary of Defense.

We are glad to have you, Mr. Spence. You may proceed.

Mr. SPENCE. Mr. Chairman, and members of the committee, I appreciate the opportunity of appearing before this committee in behalf of the Department of Defense to discuss the appropriation for retired pay for fiscal year 1973.

The appropriation requested is a consolidation of the estimates of the military departments for: retired pay of military personnel on the retired lists of the Army, Navy, Marine Corps and Air Force; retainer pay for members of the Fleet Reserves of the Navy and Marine Corps; and payments to survivors of retired military personnel under the retired serviceman's family protection plan.

INCREASE OVER 1972

The appropriation request for fiscal year 1973 is $4,359 million compared with $3,777 million initially appropriated for fiscal year 1972, plus supplemental funds of $154 million, for a total of $3,931 million. The amount requested for fiscal year 1973 will provide for payments to an avearge of 937,012, an increase of 64,791 over our current estimate for fiscal year 1972.

ANTICIPATED CONTINUING ANNUAL INCREASES UNTIL YEAR 2000

Senator YOUNG. Mr. Chairman, may I ask a question?

Chairman ELLENDER. Yes.

Seantor YOUNG. Will this figure increase from year to year? I notice the cost of retirement has gone up to over $4 billion now, and 3 or 4 years ago it was much less.

Mr. SPENCE. Yes, sir; the outlook is that the retired pay appropriation will continue to increase. I am going to assume for the moment no further pay increase or price increases. Because of the fact that the population on the retired rolls is relatively young and there is no substantial attrition from the retired rolls by reason of death, the population will continue to increase until there is approximately 1,600,000, somewhere around year 2000, and at that point the number of people retiring and number of people leaving the retired list would approximately level off. This assumes an Active Duty Force of about 2,500,000 people.

Senator YOUNG. What effect do you think an All-Volunteer Service would have?

Mr. SPENCE. Senator Young, I would think that it should not have too much impact on the total retired pay requirement. It might tend to increase it slightly, but I wouldn't think it would be an appreciable increase.

Senator YOUNG. An All-Volunteer Army would mean higher salaries than we now have, and that would tend to increase the cost.

Mr. SPENCE. If we anticipate substantially higher increases, it would tend to increase the entire appropriation for retired; yes, sir.

Senator YOUNG. Do I understand you correctly that this will increase year after year until about the year 2000?

Mr. SPENCE. Yes, about the year 2000; yes, sir.

Chairman ELLENDER. Can you give us an indication for the record of what that yearly increase would be until it reached the maximum?

Mr. SPENCE. Yes, sir. We have the information, and we will supply it for the record.

Chairman ELLENDER. Thereafter, the extent to which it will decrease, if any?

Mr. SPENCE. Yes, sir. The figures will show this.

Chairman ELLENDER. All right.

(The information follows:)

*Projected costs for military retired pay**

[In thousands of dollars]

Fiscal year:		Fiscal year:	
1978	5,302,029	1992	7,434,458
1979	5,519,826	1993	7,509,250
1980	5,720,911	1994	7,565,681
1981	5,913,034	1995	7,615,479
1982	6,088,421	1996	7,667,577
1983	6,242,688	1997	7,708,361
1984	6,384,675	1998	7,739,912
1985	6,519,212	1999	7,767,649
1986	6,674,367	2000	7,785,262
1987	6,829,607	2001	7,797,889
1988	6,990,872	2002	7,805,541
1989	7,145,692	2003	7,810,158
1990	7,260,013	2004	7,807,940
1991	7,354,761	2005	7,803,501

*Based on January 1971 military pay scales.

REGULAR AND RESERVE SERVICE RETIREMENT VARIANCE

Mr. SPENCE. May I proceed?

Chairman ELLENDER. Before you proceed, what is the basic difference between the retired pay of an individual in the Regular service and a person who has spent most of his career in the Reserves?

Mr. SPENCE. Well, assuming two individuals, one of whom spent his complete career on active duty and another individual who spent his complete career in the Reserve and with very little active duty, the retired pay accrual in the case of the Reserve man would be approximately one-seventh of the retired pay accrual of the Regular.

My basis is that within a year of satisfactory service for Reserve retired pay purposes, the man must accumulate at least 50 points, and the points are equated to years of duty, so, in effect then, in a satisfactory year, a Reserve man would accrue fifty/three-hundred-and-sixtieths of a year of active duty, or roughly one-seventh of what a man on active duty would accrue.

RETIREMENT SALARY BASES

Chairman ELLENDER. Is that pay based on the salary received while he is in the Reserve?

Mr. SPENCE. The retired pay under present law is computed based upon the terminal pay, the pay he was receiving or would have been entitled to receive if on active duty on the last day prior to going into retirement status.

Chairman ELLENDER. And is the same formula used for the Reserve?

Mr. SPENCE. The reservist's pay is based upon the base pay scales in effect at the time he goes into retired pay status; yes, sir.

1972 SUPPLEMENTAL FUNDING

The supplemental funds for fiscal year 1972, are required to provide for the additional retirement costs resulting from a cost-of-living increase and two increases in the military pay of military personnel retiring during the year. Under the law, when the consumer price index (CPI) for any month is at least 3 percent higher than the CPI for the month which was the basis for the last adjustment to retired pay and sustains that level for 3 consecutive months, retired pay is adjusted to the highest percent of increase in that 3-month period, plus 1 percent, effective on the first day of the third month following that period. One increase of 4.5 percent in retired pay, effective June 1, 1971, has occurred since the fiscal year 1972 budget estimate was submitted to the Congress. Under the provisions of Public Law 92–129, an increase in pay of certain military personnel became effective November 14, 1971. Also, a 7.21-percent increase in military pay, effective January 1, 1972, was authorized by Executive Order 11638 (December 22, 1971), issued pursuant to Public Law 90–207 (December 16, 1967).

MAJOR CATEGORIES OF PERSONNEL

NONDISABILITY

This category includes personnel who were retired for age or length of service.

It is estimated that $3,255.4 million or 74.7 percent of the total appropriation request will be required to provide for an average of 660,725 annuitants in the nondisability category in fiscal year 1973. This compares with an average of 601,579 annuitants now estimated for fiscal year 1972.

TEMPORARY DISABILITY

The temporary disability category is an interim classification for disabled personnel where there is some doubt as to the degree or permanence of their disability. Personnel are carried on the temporary disability list for a period of not to exceed 5 years in accordance with chapter 61 of title 10, United States Code. During this 5-year period, physical examinations are required at least once every 18 months to determine whether such individuals (*a*) have recovered from their disability and can be returned to active duty, (*b*) should be discharged, or (*c*) should be transferred to the permanent disability rolls.

It is estimated that $100.9 million or 2.3 percent of the total appropriation request will be required to provide for an average of 25,725 annuitants in fiscal year 1973, as compared with 24,508 now estimated for fiscal year 1972.

PERMANENT DISABILITY

This category is composed of personnel whose disability has been definitely established as "permanent." Persons may be placed on the permanent disability rolls immediately following the termination of their active duty or by transfer from the temporary disability rolls. It is estimated that $605.7 million or 13.9 percent of the total appropriation request will be required in fiscal year 1973, for an average of 138,288 permanently disabled retired military personnel. This compares with an average of 131,499 now estimated for fiscal year 1972.

FLEET RESERVE

The Fleet Reserve category is composed of Navy and Marine Corps enlisted personnel having 20 but less than 30 years of service who elect to transfer from active duty to the Fleet Reserve. Upon completion of 30 years of combined active service and service in the Fleet Reserve or upon being found physically unfit for further military service, such personnel are transferred to the regular retired rolls. It is estimated that $381.6 million or 8.7 percent of the appropriation request will be required in fiscal year 1973, to provide for an average of 102,186 Fleet Reservists. This compares with an average of 105,486 now estimated for fiscal year 1972.

SURVIVORS' BENEFITS

The survivors' benefits category includes the amounts estimated to be required to make payments to survivors of retired personnel pursuant to the retired serviceman's family protection plan. This is a self-supporting plan which permits a member of the uniformed services to receive a reduced amount of retired pay in order to provide one or more annuities specified in the plan for his survivors. The amount of the reduction in each member's case is computed by the actuarial-equivalent method; that is, the total amount of reduced retired pay received by the member and the benefit payments made to his survivors will, on the average, not exceed the total amount of retired pay the member would have received had he not participated in the program plus interest on the amounts so withheld.

It is estimated that $15.0 million or 0.4 percent of the total appropriation request will be required to provide for an average of 10,088 in fiscal year 1973. This compares with an average of 9,149 now estimated for fiscal year 1972.

SUMMARY

The amounts included for each of the categories are mathematical computations of averages of the rates presently prescribed by law applied to the best available projections of the number of personnel to be carried on the rolls in fiscal years 1972 and 1973.

Payments under this appropriation are required by law and any funds not required revert to the Treasury at the end of the fiscal year.

INTRODUCTION OF ASSOCIATES

Mr. Chairman, Col. John H. Boyd, USAF, the Director of Compensation Administration in the Office of the Deputy Assistant Secretary of Defense for Military Personnel Policy, and Mr. Carl M. Detwyler, Director of the Directorate for Military Personnel in the Office of the Deputy Assistant Secretary of Defense (Comptroller) are with me today. We will be happy to attempt to answer any questions the chairman or committee members may have.

UNFUNDED LIABILITY

Chairman ELLENDER. Please supply for the record a statement of the unfunded liability of the Federal Government in connection with retired pay, projecting this into the future in a manner similar to that you have done in the past.

Mr. SPENCE. Yes, sir.

(The information follows:)

Projected accrued past service "Unfunded liability" costs for military personnel[1]

Year:	*Amount (millions)*	Year:	*Amount (millions)*
1972	$126,385	1979	$146,437
1973	129,854	1980	148,529
1974	133,127	1981	150,467
1975	136,201	1982	152,269
1976	139,072	1983	153,958
1977	141,762	1984	155,546
1978	144,183	1985	157,032

[1] Assumes no further pay or price-index increases.

Mr. SPENCE. In fiscal year 1973 we estimate unfunded liability is $129 billion, and in 1985 we estimate it will be $157 billion. Now, this assumes that there are no further pay or price increases.

Chairman ELLENDER. I understand.

Mr. SPENCE. If there are pay or price increases, the amounts will be larger.

Chairman ELLENDER. Yes. That is under the present pay scale?

Mr. SPENCE. This pay scale; yes.

Chairman ELLENDER. That is quite a sum of money.

Mr. SPENCE. Yes, sir.

Chairman ELLENDER. And as long as we maintain a military force of the present size, this will continue.

Mr. SPENCE. For as long as you maintain the size of forces we have today, it is inevitable that retired pay costs are going to continue to increase.

Chairman ELLENDER. The tables accompanying your statement will appear in the record at this point.

(The information follows:)

NEW OBLIGATIONAL AUTHORITY, OBLIGATIONS, UNOBLIGATED BALANCE, AND AVERAGE NUMBER ON RETIRED MILITARY ROLLS

Fiscal Year	(In Thousands of Dollars) New Obligational Authority	Obligations	Unobligated Balance	Average Number 3/
Actual				
1950	306,016	304,376	1,640	N.A.
1951	342,000	324,089	17,911	N.A.
1952	345,000	330,598	14,402	137,785
1953	357,000	356,385	615	147,216
1954	387,000	386,298	702	162,305
1955	423,500	422,102	1,398	174,012
1956	495,000	478,932	16,068	185,754
1957	515,000	510,784	4,216	192,209
1958	567,000	560,962	6,038	208,570
1959	640,000	634,542	5,458	222,545
1960	715,000	692,922	22,078	242,904
1961	789,500	787,806	1,694	275,914
1962	920,000 1/	895,854	24,146	313,436
1963	1,029,000 2/	1,014,775	10,925	358,830
1964	1,228,000	1,211,215	16,785	410,853
1965	1,399,000	1,385,578	13,422	462,463
1966	1,600,000	1,592,352	7,648	508,566
1967	1,839,000	1,831,159	7,841	564,280
1968	2,095,000	2,093,478	1,522	624,496
1969	2,450,000	2,442,941	7,059	691,688
1970	2,859,000	2,853,234	4,766	750,144
1971	3,391,032	3,388,999	2,033	806,139
Estimate				
1972		3,931,446		872,221
1973		4,358,684		937,012
1974		4,671,000		990,000
1975		4,979,000		1,044,000
1976		5,284,000		1,097,000
1977		5,562,000		1,145,000

1/ $3.3 million transferred to "Claims, Defense".
2/ $1.0 million transferred to "Operation and Maintenance, Defense Agencies".
3/ Includes those receiving Survivors' Benefits.

NET INCREASES IN END STRENGTHS FROM THE PREVIOUS FISCAL YEAR BY ACTIVITY

Activity	Fiscal Year 1971 Actual	Fiscal Year 1971 Percent	Fiscal Year 1972 Estimate	Fiscal Year 1972 Percent	Fiscal Year 1973 Estimate	Fiscal Year 1973 Percent
Nondisability	54,298	10.63	62,000	10.97	57,299	9.13
Temporary Disability	588	2.54	1,639	6.92	743	2.93
Permanent Disability	5,784	4.75	7,476	5.86	6,175	4.57
Fleet Reserve	-2,933	-2.68	-1,388	-1.30	-4,403	-4.20
Survivors' Benefits	804	10.19	888	10.21	1,002	10.46
TOTAL	58,541	7.58	70,615	8.49	60,816	6.74

ACTUAL END STRENGTHS, OBLIGATIONS AND EXPENDITURES IN FY 1972

(Dollars in Thousands)

Month	End Strengths	Obligations	Expenditures
July 1971	837,893	$310,759	$307,186
August	846,124	313,734	312,000
September	852,907	317,273	317,443
October	858,226	320,102	319,907
November	862,761	322,585	322,343
December	867,080	322,464	322,407
January 1972	870,162	324,685	324,121

ACTUAL NUMBER OF RETIREMENTS AMONG MILITARY PERSONNEL ON ACTIVE DUTY

Fiscal Year	By Category Total	By Category Officer	By Category Enlisted	By Type of Retirement Nondisability	By Type of Retirement Disability
1958	21,180	6,563	14,617	13,674	7,506
1959	21,290	5,778	15,512	14,029	7,261
1960	29,353	6,823	22,530	22,626	6,727
1961	42,034	12,886	29,148	35,198	6,836
1962	40,929	10,153	30,776	34,110	6,819
1963	57,629	14,319	43,310	49,166	8,463
1964	57,384	13,609	43,775	48,900	8,484
1965	55,772	13,872	41,900	46,635	9,137
1966	54,032	11,852	42,180	43,334	10,698
1967	67,003	12,880	54,123	54,404	12,599
1968	69,086	11,927	57,159	53,066	16,020
1969	71,344	12,333	59,011	48,986	22,358
1970	77,623	19,120	58,503	54,037	23,586
1971	80,801	18,298	62,503	57,879	22,922
"Normal" for an active force of present size with current retention rates:	59,209	8,676	50,533	49,646	9,563

TITLE III, PUBLIC LAW 810, RETIREES (10 U.S.C. 1331)

Category	FY 1971 Actual End Number	FY 1971 Actual Ave. Number	FY 1971 Actual Obligs. ($000)	FY 1972 Estimate End Number	FY 1972 Estimate Ave. Number	FY 1972 Estimate Obligs. ($000)	FY 1973 Estimate End Number	FY 1973 Estimate Ave. Number	FY 1973 Estimate Obligs. ($000)
Officers	40,263	38,855	121,898	43,382	41,961	138,259	46,489	45,074	150,894
Enlisted	4,612	4,323	7,034	5,524	5,119	8,933	6,195	5,888	10,563
TOTAL	44,875	43,178	128,932	48,906	47,080	147,192	52,684	50,962	161,457

COMPARISON OF RETIRED PAY WITH DEPARTMENT OF DEFENSE OUTLAYS

(Dollars in Millions)

Fiscal Year	Military Functions	Retired Pay Portion	Percent
1937	$934	$55	5.89
1938	1,033	59	5.71
1939	1,075	61	5.67
1940	1,492	66	4.42
1941	5,998	73	1.22
1942	23,570	84	.36
1943	62,664	49	.08
1944	75,797	57	.08
1945	80,048	57	.07
1946	42,044	85	.20
1947	13,838	140	1.01
1948	10,937	175	1.60
1949	11,573	193	1.67
1950	11,891	193	1.62
1951	19,764	321	1.62
1952	38,897	329	.85
1953	43,604	357	.82
1954	40,326	386	.96
1955	35,531	419	1.18
1956	35,792	477	1.33
1957	38,436	511	1.33
1958	39,070	562	1.44
1959	41,223	641	1.55
1960	41,215	694	1.68
1961	43,227	786	1.82
1962	46,815	894	1.91
1963	48,252	1,015	2.10
1964	49,577	1,209	2.44
1965	45,973	1,384	3.01
1966	54,178	1,591	2.94
1967	67,457	1,830	2.71
1968	77,373	2,095	2.71
1969	77,872	2,444	3.14
1970	77,150	2,849	3.69
1971	74,546	3,386	4.54
1972 (Estimate)	75,000	3,933	5.24
1973 (Estimate	75,900	4,359	5.74

RETIRED SERVICEMAN'S FAMILY PROTECTION PLAN

(Dollars in Thousands)

Fiscal Year	No. of Retirees Electing to Participate1/	Deduction in Retired Pay	Survivors Receiving Benefits1/	Payment to Survivors
1954 (last 8 months)	11,243	$1,597	149	$67
1955	11,401	4,308	499	462
1956	12,580	4,692	814	797
1957	14,859	5,424	1,128	1,136
1958	17,890	6,251	1,469	1,479
1959	19,846	7,204	1,881	1,880
1960	22,967	7,786	2,312	2,422
1961	27,997	8,933	2,807	3,003
1962	33,659	10,806	3,271	3,495
1963	43,254	13,141	3,713	3,992
1964	52,143	14,906	4,187	4,595
1965	60,996	18,447	4,643	5,295
1966	69,445	21,338	5,149	6,046
1967	80,102	24,762	5,746	6,850
1968	91,371	28,446	6,476	7,869
1969	100,208	32,751	7,202	9,009
1970	108,272	36,680	7,891	10,283
1971	117,129	41,858	8,695	11,730
1972 (Estimate)	126,676	45,431	9,583	13,238
1973 (Estimate)	135,408	48,855	10,585	15,044
TOTAL		$383,6132/		$108,692

1/ Number at end of fiscal year.

2/ Annual amounts will not add to total due to rounding.

RETIRED MILITARY PERSONNEL ELECTING SURVIVORS' BENEFITS AND AMOUNT OF DEDUCTION FROM RETIRED PAY
BY ACTIVITY AND CATEGORY

(Dollars in Thousands)

Activity and Category	Past Year FY 1971		Current Year FY 1972		Budget Year FY 1973	
	No. on Rolls End of FY	Amount of Deduction	No. on Rolls End of FY	Amount of Deduction	No. on Rolls End of FY	Amount of Deduction
Nondisability						
Regular Officers	23,850	$14,483	25,379	$15,624	26,871	$16,761
Regular Enlisted	34,917	5,056	41,055	5,966	46,465	6,749
Nonregular Officers	28,720	13,360	30,212	14,166	31,674	14,977
Nonregular Enlisted	593	128	670	150	747	174
Subtotal	88,080	33,027	97,316	35,906	105,757	38,661
Temporary Disability						
Regular Officers	534	442	581	521	632	606
Regular Enlisted	635	116	671	133	707	151
Nonregular Officers	348	130	368	148	387	165
Nonregular Enlisted	9	3	9	3	9	4
Subtotal	1,526	691	1,629	805	1,735	926
Permanent Disability						
Regular Officers	4,030	3,176	4,375	3,522	4,722	3,874
Regular Enlisted	3,957	766	4,216	820	4,430	867
Nonregular Officers	4,501	2,036	4,533	2,076	4,565	2,115
Nonregular Enlisted	112	11	108	11	108	11
Subtotal	12,600	5,989	13,232	6,429	13,825	6,867
Fleet Reserve						
Regular Enlisted	13,046	1,763	12,621	1,916	12,213	2,048
Nonregular Enlisted	607	76	622	91	637	93
Subtotal	13,653	1,839	13,243	2,007	12,850	2,141
Total Receiving Reduced Retired Pay	115,859	41,546	125,420	45,147	134,167	48,595
Cash Contributions	1,270	312	1,256	284	1,241	260
TOTAL	117,129	41,858	126,676	45,431	135,408	48,855

MILITARY PERSONNEL RECEIVING RETIRED OR RETAINER PAY AS OF 30 JUNE 1971

Retired Pay Grade	All Retirements1/ No. of Persons	All Retirements1/ Monthly Amount	All Retirements1/ Ave.Mo. Ret.Pay	Nondisability Retirements1/ No. of Persons	Nondisability Retirements1/ Monthly Amount	Nondisability Retirements1/ Ave.Mo. Ret.Pay	Disability Retirements No. of Persons	Disability Retirements Monthly Amount	Disability Retirements Ave.Mo. Ret.Pay
O-10	126	$231,379	$1,836	66	$119,994	$1,818	60	$111,385	$1,856
O-9	319	501,467	1,572	185	287,926	1,556	134	213,541	1,594
O-8	1,693	2,175,377	1,285	1,131	1,382,713	1,223	562	792,664	1,410
O-7	1,697	1,779,479	1,049	1,258	1,262,202	1,003	439	517,277	1,178
O-6	43,999	37,046,237	842	36,783	30,035,151	817	7,216	7,011,086	972
O-5	83,958	53,763,615	640	73,910	46,486,457	629	10,048	7,277,158	724
O-4	61,520	31,609,805	514	51,667	26,582,144	514	9,853	5,027,661	510
O-3	28,725	11,526,087	401	15,242	6,535,828	429	13,483	4,990,259	370
O-2	16,104	4,818,707	299	3,905	1,340,712	343	12,199	3,477,995	285
O-1	5,465	1,361,872	249	727	208,318	287	4,738	1,153,554	243
W-4	9,336	5,386,818	577	8,296	4,738,222	571	1,040	648,596	624
W-3	9,428	3,804,569	404	8,678	3,476,375	401	750	328,194	438
W-2	13,695	4,754,203	347	12,117	4,207,538	347	1,578	546,665	346
W-1	4,752	1,366,172	287	3,464	1,021,956	295	1,288	344,216	267
Total Officers	280,817	$160,125,787	$570	217,429	$127,685,536	$587	63,388	$32,440,251	$512
E-9	22,481	$10,419,403	$463	20,249	$9,282,135	$458	2,232	$1,137,268	$510
E-8	51,908	18,959,236	365	47,504	17,196,389	362	4,404	1,762,847	400
E-7	211,090	61,548,177	292	193,518	56,006,642	289	17,572	5,541,535	315
E-6	141,833	34,269,845	242	125,439	30,505,741	243	16,394	3,764,104	230
E-5	73,787	14,369,152	195	55,912	11,279,572	202	17,875	3,089,580	173
E-4	25,211 2/	3,397,392 2/	135	9,478	1,469,367	155	15,733 2/	1,928,025 2/	123
E-3	10,657	943,553	89	1,463	170,059	116	9,194	773,494	84
E-2	3,955	268,916	68	302	32,175	107	3,653	236,741	65
E-1	896	90,451	101	84	11,442	136	812	79,009	97
Total Enlisted	541,818	$144,266,125	$266	453,949	$125,953,522	$277	87,869	$18,312,603	$208
Grand Total	822,635	$304,391,912	$370	671,378	$253,639,058	$378	151,257	$50,752,854	$336

1/ Includes Fleet Reserve. 2/ Includes 11 NAVCADS.

Analysis by Fiscal Year of the Number of Retired Personnel and Obligations for the Department of Defense
(Dollars in Thousands)

Activity and Category	Actual FY 1971			Estimate FY 1972			Estimate FY 1973		
	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.
Nondisability									
Regular Officers	87,085	84,889	$689,928	92,948	91,025	$801,310	98,146	96,264	$876,271
Regular Enlisted	342,712	326,296	1,032,436	388,917	369,364	1,267,241	430,919	413,340	1,475,237
Nonregular Officers	130,344	126,755	733,068	139,117	135,389	824,096	147,825	144,063	889,763
Nonregular Enlisted	5,171	4,852	8,548	6,330	5,801	10,905	7,721	7,058	14,165
Subtotal	565,312	542,792	2,463,980	627,312	601,579	2,903,552	684,611	660,725	3,255,436
Temporary Disability									
Regular Officers	1,716	1,673	16,502	1,935	1,842	19,929	2,195	2,089	25,457
Regular Enlisted	17,053	17,114	37,974	17,767	17,285	45,295	18,001	17,868	51,285
Nonregular Officers	1,746	1,710	11,529	1,989	1,882	14,259	2,200	2,104	18,221
Nonregular Enlisted	3,178	3,300	3,803	3,641	3,499	4,923	3,679	3,664	5,952
Subtotal	23,693	23,797	69,808	25,332	24,508	84,406	26,075	25,725	100,915
Permanent Disability									
Regular Officers	18,514	18,152	143,950	19,358	19,008	161,885	20,086	19,750	175,334
Regular Enlisted	62,667	60,248	152,497	68,170	65,533	179,241	73,100	70,724	206,159
Nonregular Officers	41,412	41,276	193,391	41,904	41,678	206,529	42,113	42,042	216,498
Nonregular Enlisted	4,971	4,799	5,519	5,608	5,280	6,506	5,916	5,772	7,704
Subtotal	127,564	124,475	495,357	135,040	131,499	554,161	141,215	138,288	605,695
Fleet Reserve	106,066	106,759	348,124	104,678	105,486	376,089	100,275	102,186	381,594
Survivors Benefits	8,695	8,316	11,730	9,583	9,149	13,238	10,585	10,088	15,044
TOTAL	831,330	806,139	3,388,999	901,945	872,221	3,931,446	962,761	937,012	4,358,684

Analysis by Fiscal Year of the Number of Retired Personnel and Obligations for the Department of the Army
(Dollars in Thousands)

Activity and Category	Actual FY 1971			Estimate FY 1972			Estimate FY 1973		
	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.
Nondisability									
Regular Officers	17,098	16,741	$167,795	18,228	17,802	$195,079	19,166	18,794	$212,319
Regular Enlisted	139,740	136,167	434,780	148,784	144,504	501,009	157,528	153,676	555,190
Nonregular Officers	75,598	73,713	405,802	80,570	78,374	454,282	85,850	83,582	491,107
Nonregular Enlisted	1,858	1,728	2,722	2,386	2,146	3,612	2,696	2,552	4,403
Subtotal	234,294	228,349	1,011,099	249,968	242,826	1,153,982	265,240	258,604	1,263,019
Temporary Disability									
Regular Officers	375	371	4,195	457	417	5,127	539	499	6,654
Regular Enlisted	5,641	5,439	12,133	6,377	5,975	14,888	7,109	6,737	18,620
Nonregular Officers	993	941	6,437	1,207	1,109	8,681	1,401	1,311	11,827
Nonregular Enlisted	2,794	2,875	2,996	3,289	3,135	4,033	3,345	3,325	5,013
Subtotal	9,803	9,626	25,761	11,330	10,636	32,729	12,394	11,872	42,114
Permanent Disability									
Regular Officers	5,954	5,873	46,164	6,218	6,124	51,551	6,436	6,343	57,039
Regular Enlisted	18,890	18,225	45,178	20,338	19,606	53,238	21,580	20,955	62,696
Nonregular Officers	25,273	25,211	109,810	25,646	25,478	116,994	25,741	25,723	123,629
Nonregular Enlisted	3,439	3,297	2,967	4,013	3,716	3,900	4,258	4,143	4,943
Subtotal	53,556	52,606	204,119	56,215	54,924	225,683	58,015	57,164	248,307
Fleet Reserve									
Survivors' Benefits	3,848	3,686	4,560	4,233	4,039	5,147	4,693	4,462	5,857
TOTAL	301,501	294,267	1,245,534	321,746	312,425	1,417,541	340,342	332,102	1,559,297

Analysis by Fiscal Year of the Number of Retired Personnel and Obligations for the Department of the Navy (Navy)
(Dollars in Thousands)

Activity and Category	Actual FY 1971			Estimate FY 1972			Estimate FY 1973		
	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.
Nondisability									
Regular Officers	41,448	40,899	$285,287	43,521	42,935	$322,868	45,698	45,030	$351,600
Regular Enlisted	54,928	50,631	153,746	64,334	60,306	194,006	75,006	70,284	231,216
Nonregular Officers	12,182	11,735	48,435	13,229	12,827	56,876	14,131	13,762	62,867
Nonregular Enlisted	2,887	2,732	5,167	3,413	3,171	6,417	4,394	3,920	8,636
Subtotal	111,445	105,997	492,635	124,497	119,239	580,167	139,229	132,996	654,319
Temporary Disability									
Regular Officers	718	691	6,778	846	796	8,585	995	940	11,457
Regular Enlisted	4,414	4,456	10,975	3,978	4,174	14,149	3,555	3,752	14,610
Nonregular Officers	242	239	1,694	248	255	1,895	249	249	2,037
Nonregular Enlisted	315	333	659	288	298	771	263	273	806
Subtotal	5,689	5,719	20,106	5,360	5,523	25,400	5,062	5,214	28,910
Permanent Disability									
Regular Officers	5,831	5,826	38,823	5,825	5,834	41,425	5,819	5,835	42,575
Regular Enlisted	13,109	12,701	27,755	13,956	13,579	30,779	14,792	14,415	33,212
Nonregular Officers	3,243	3,255	13,913	3,221	3,228	14,468	3,199	3,214	14,684
Nonregular Enlisted	1,109	1,081	2,052	1,163	1,136	2,055	1,223	1,196	2,173
Subtotal	23,292	22,863	82,543	24,165	23,777	88,727	25,033	24,660	92,644
Fleet Reserve	90,270	91,621	293,459	87,903	89,037	311,531	82,879	85,074	312,080
Survivors Benefits	2,315	2,241	3,057	2,480	2,411	3,334	2,656	2,572	3,609
TOTAL	233,011	228,441	891,800	244,405	239,987	1,099,159	254,859	250,516	1,091,562

Analysis by Fiscal Year of the Number of Retired Personnel and Obligations for the Department of the Navy (Marine Corps)
(Dollars in Thousands)

Activity and Category	Actual FY 1971			Estimate FY 1972			Estimate FY 1973		
	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.
Nondisability									
Regular Officers	7,890	7,623	$54,208	8,506	8,256	$62,513	8,906	8,722	$67,667
Regular Enlisted	5,839	5,369	17,828	7,104	6,673	27,166	8,403	7,808	36,670
Nonregular Officers	938	922	4,842	1,138	1,036	6,105	1,287	1,219	7,955
Nonregular Enlisted	76	73	145	87	81	172	98	93	216
Subtotal	14,743	13,987	77,023	16,835	16,046	95,956	18,694	17,842	112,508
Temporary Disability									
Regular Officers	330	302	2,479	340	343	2,957	371	358	3,190
Regular Enlisted	4,122	4,212	8,087	4,299	4,167	8,897	4,336	4,321	9,793
Nonregular Officers	128	137	698	143	134	788	155	152	1,000
Nonregular Enlisted	39	54	71	39	39	60	51	45	83
Subtotal	4,619	4,705	11,335	4,821	4,683	12,702	4,913	4,876	14,066
Permanent Disability									
Regular Officers	1,468	1,439	9,465	1,509	1,498	10,492	1,509	1,508	10,746
Regular Enlisted	5,132	4,836	9,267	6,174	5,662	11,583	7,465	6,872	14,644
Nonregular Officers	871	862	3,252	869	876	3,525	878	873	3,570
Nonregular Enlisted	326	327	327	326	326	350	326	326	354
Subtotal	7,797	7,464	22,311	8,878	8,362	25,950	10,178	9,579	29,314
Fleet Reserve	15,796	15,138	54,665	16,775	16,449	64,558	17,396	17,112	69,514
Survivors' Benefits	256	246	392	282	269	425	308	297	463
TOTAL	43,211	41,540	165,726	47,591	45,809	199,591	51,489	49,706	225,865

ANALYSIS BY FISCAL YEAR OF THE NUMBER OF RETIRED PERSONNEL AND OBLIGATIONS FOR THE DEPARTMENT OF THE AIR FORCE

(Dollars in Thousands)

Activity and Category	Actual FY 1971			Estimate FY 1972			Estimate FY 1973		
	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.	End No.	Ave. No.	Obligs.
Nondisability									
Regular Officers	20,649	19,626	$182,638	22,693	22,032	$220,850	24,376	23,718	$244,685
Regular Enlisted	142,205	134,129	426,082	168,695	157,881	545,060	189,982	181,572	652,161
Nonregular Officers	41,676	40,385	273,989	44,180	43,152	306,833	46,557	45,500	327,834
Nonregular Enlisted	350	319	514	444	403	704	533	493	910
Subtotal	204,830	194,459	883,223	236,012	223,468	1,073,447	261,448	251,283	1,225,590
Temporary Disability									
Regular Officers	293	309	3,050	292	286	3,260	290	292	4,156
Regular Enlisted	2,876	3,007	6,779	3,113	2,969	7,361	3,001	3,058	8,262
Nonregular Officers	383	393	2,700	391	384	2,895	395	392	3,357
Nonregular Enlisted	30	38	77	25	27	59	20	21	50
Subtotal	3,582	3,747	12,606	3,821	3,666	13,575	3,706	3,763	15,825
Permanent Disability									
Regular Officers	5,261	5,014	49,498	5,806	5,552	58,417	6,322	6,064	64,974
Regular Enlisted	25,536	24,486	70,297	27,702	26,686	83,641	29,263	28,482	95,607
Nonregular Officers	12,025	11,948	66,416	12,168	12,096	71,542	12,295	12,232	74,615
Nonregular Enlisted	97	94	173	106	102	201	109	107	234
Subtotal	42,919	41,542	186,384	45,782	44,436	213,801	47,989	46,855	235,430
Fleet Reserve Survivors' Benefits	2,276	2,143	3,721	2,588	2,430	4,332	2,928	2,757	5,115
TOTAL	253,607	241,891	1,085,934	288,203	274,000	1,305,155	316,071	304,688	1,481,960

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SUBCOMMITTEE RECESS

Chairman ELLENDER. Well, we thank you very much, Mr. Spence, if you don't have anything else to add?

Mr. SPENCE. No, sir; I have nothing further.

Chairman ELLENDER. The subcommittee will stand in recess until 10 o'clock, Tuesday morning.

(Whereupon, at 12:05 p.m., Thursday, March 16, the subcommittee recessed, to reconvene at 10 a.m., Tuesday, March 21.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

WEDNESDAY, MARCH 22, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

DEPARTMENT OF DEFENSE

DEFENSE SUPPLY AGENCY

STATEMENT OF LT. GEN. WALLACE H. ROBINSON, JR., U.S. MARINE CORPS, DIRECTOR

ACCOMPANIED BY:
MELVIN H. BAKER, COMPTROLLER
JAMES R. JONES, SR., CHIEF, OPERATIONS BUDGETS DIVISION OFFICE OF COMPTROLLER

BUDGET REQUESTS

Chairman ELLENDER. The subcommittee will be in order.

The next items to be considered are those for the Defense Supply Agency, for which the total fiscal year 1973 request is $724,643,000.

This is contained in the following appropriations:

Operations and maintenance, Defense agencies, $696.2 million.

Procurement, Defense agencies, $8.4 million.

Research, development, test, and evaluation, Defense agencies, $12.9 million.

Military construction, Defense agencies, $7 million.

Family housing, Defense agencies, $143,000.

The two latter accounts for military construction and family housing are contained in another appropriation bill. Funds for operation and maintenance, procurement, and research and development are requested in the bill before us.

PRESENTATION FORMAT

The principal witness is Lt. Gen. Wallace H. Robinson, Jr., Director of the Defense Supply Agency.

You may proceed.

General ROBINSON. Thank you, Mr. Chairman. I have a prepared statement, sir, which will take about 15 minutes.

Mr. Chairman and Senator Young, I appreciate this opportunity to present the Defense Supply Agency budget requirements for fiscal

year 1973. My prepared statement highlights the nature and scope of the agency mission and addresses our resource needs. In addition to the operation and maintenance area, I shall also mention briefly our requirements under the procurement, research and development, military construction, and family housing appropriations.

Chairman ELLENDER. All of these appropriations are to maintain the Agency itself?

General ROBINSON. Yes, sir.

Chairman ELLENDER. It does not include any materials managed by the Defense Supply Agency?

General ROBINSON. No, sir.

Chairman ELLENDER. You may proceed.

AGENCY MISSION AND SCOPE OF PROGRAMS

General ROBINSON. The mission of the Defense Supply Agency is to provide responsive and economical logistics supply in three principal areas:

CONSUMABLE MATERIEL AND REPAIR PARTS

First, we provide worldwide supply for a wide range of consumable materiel and repair parts to the military services and certain allied forces. We also provide this support to Federal civil agencies in designated commodities. This function involves central management responsibility for about one-half of the 3.8 million items in the defense segment of the Federal catalog. In terms of annual volume, our supply operations entail procurements totaling $3.3 billion, the processing of some 20 million supply transactions, and the handling of 1.7 million short tons of materiel by our depots.

LOGISTICS SERVICES PROGRAMS

We also administer several defense-wide logistics services programs. These include: Coordinated procurement; Federal cataloging; military standard logistics data systems; maintenance, storage, and reutilization of idle industrial plant equipment; materiel reutilization and surplus disposal; and scientific and technical documentation services in support of the research and development community.

SECONDARY ITEMS: REPAIR PARTS CODED FOR AGENCY MANAGEMENT

Chairman ELLENDER. Can you designate what the principal materiels are that the Defense Agency supplies to the departments?

General ROBINSON. Our principal items are what are generally known as secondary items. These are certain repair parts, clothing——

Chairman ELLENDER. For what are the "certain repair parts"?

General ROBINSON. These would be repair parts, sir, for all types of equipment used by the military services when these parts have been coded to the Defense Supply Agency for management.

Chairman ELLENDER. When does that happen?

General ROBINSON. The military service, in provisioning for a new item of equipment, will go through a coding criteria for those items in the classes that have been designated for management by the Defense Supply Agency as Defense Department policy. If the screening against these criteria so determines, the item is then assigned to Defense Supply Agency for management. If not, the service keeps it.

SERVICE MANAGEMENT OF CRITICAL WEAPONS SYSTEMS

Chairman ELLENDER. Why is it managed so that only a part of the supply system is handled by you?

General ROBINSON. Some of the parts are, for example, "weapons system critical." In these cases, the services are permitted to retain management of these items. Also, some items are repairable.

Chairman ELLENDER. What determines this?

General ROBINSON. The services have determined that the immediate availability and total control of those items for the critical weapons systems are essential to the proper operation of these systems when they need them.

SUGGESTED ADMINISTRATION COST INCREASE

Chairman ELLENDER. It strikes me that that calls for some kind of—I won't say "duplication of effort"—but it strikes me that if some of it must be managed by the military services, then all of it ought to be handled by the same service.

I don't see where we save anything by such a procedure. I wish you would so state if you know any places in which you could save by combining service procurement with your own.

General ROBINSON. Mr. Chairman, there is no duplication. Those items which are held by the services are still handled under current policy on the one-item, one-manager basis. In other words, if an item is used by the Air Force in a weapons system and that item is also needed in a weapons system of the Navy, one of the two services is assigned to manage the item for both.

Chairman ELLENDER. That is what I had in mind. Why cannot all of the items for the military be handled by the agency that handles the critical part you speak of? Why have two procurement agencies? It means more administration. You will agree to that, I believe.

General ROBINSON. Mr. Chairman, we avoid duplicate administration. The items that are possible to manage on an integrated basis by an agency, such as the Defense Supply Agency, are so coded and so managed by the Defense Supply Agency. Other items which need engineering expertise and knowledge and immediate availability to weapons systems are retained by the services, but only by one.

I feel that the current coding criteria is sufficient to pull out those items that we can economically manage on an integrated basis. These we will continue to pull out of the services and manage.

Chairman ELLENDER. Do you have any idea of the cost of procurement in a military service as compared to the cost in your own agency?

General ROBINSON. No, sir; I do not have that knowledge at the present time.

CIVILIAN AND MILITARY PERSONNEL AND NECESSITY FOR MILITARY MANAGEMENT

Chairman ELLENDER. I would like to have placed in the record the number of military and civilian employees employed in the Defense Supply Agency.

General ROBINSON. Yes, sir.

(The information follows:)

PERSONNEL END STRENGTH

Appropriation	Fiscal year 1971			Fiscal year 1972			Fiscal year 1973		
	Military	Civilian	Total	Military	Civilian	Total	Military	Civilian	Total
O. & M. DA	1,172	48,253	49,425	1,171	46,300	47,471	1,163	46,300	47,463
R.D.T. & E., DA	3	527	530	3	475	478	3	475	478
DIF		1,654	1,654		1,650	1,650		1,650	1,650
Total	1,175	50,434	51,609	1,174	48,425	49,599	1,166	48,425	49,591

JEWEL BEARING PLANT, ROLLA, N. DAK.: NONPROCUREMENT BY MILITARY CONTRACTORS

Senator YOUNG. General, following World War II, a jewel bearing plant was established in Rolla, N. Dak., adjacent to the Indian reservation. It is the only jewel bearing plant in the United States. And 90 percent of the jewel bearings are imported.

Finally, there was an order issued that certain military contractors should use these jewel bearings. But we find now that they are not using them, and this plant is only operating at part capacity. And where we are spending millions of dollars on this one reservation alone to support these Indians, why can't a way be found to use these bearings?

There was a committee established, with representation from Defense, Commerce, the General Services Administration. I think one other department was represented. But they haven't done anything.

I have asked the General Accounting Office to make an investigation of why these bearings have not been used and what the trouble is, and they are in that process now. I wish you would look into this. If if comes within your jurisdiction, find out why these bearings are not used, and why we have only part employment there, when we are paying these Indians welfare in order to live when they really want to work. And they do a good job.

Most of the bearings they are making now are special order, the type they cannot get in Switzerland or some other place.

General ROBINSON. I will be glad to look into that.

Senator YOUNG. I wish you would and report to me. I have been wrestling with this for years. It is the only jewel bearing plant in the United States.

General ROBINSON. As you know, the Defense Supply Agency does not choose the items that the military services need. So, fundamentally, the services would decide if this type of bearing were needed.

However, if this type of bearing falls within a general specification, then we would have to determine why, perhaps, this plant has not made known that their bearings are available. Or, if they have, we would be glad to look into exactly why, if we haven't, we have not procured any bearings from this source.

Senator YOUNG. I wish you would, because somehow, some way, I will get employment for these Indians, as long as we have that plant, and as long as we import about 90 percent of such items, and as long as you are procuring only the jewel bearing made there you cannot get some other place. They make every kind of jewel bearing.

Chairman ELLENDER. We will take a brief recess.

(Brief recess.)

Chairman ELLENDER. Proceed.

CONTRACT ADMINISTRATION SERVICES

General ROBINSON. Finally, we perform contract administration services for most of the central procurements made by the Defense Department and the National Aeronautics and Space Administration. These services are performed on about 167,000 contracts with a face value of $49 billion. Shipments under these contracts total $15 billion annually, and payments to contractors involve some 1.1 million invoices.

WORKLOAD AND EMPLOYMENT DEVELOPMENTS

The mission of the Defense Supply Agency requires that we respond to the needs and actions of the military services. Thus, our workloads are demand oriented rather than internally controlled. Because the actual demands for support and services govern our resource requirements, I would like to summarize the recent history and current status of these developments.

The Defense Supply Agency workload has been affected rather markedly for an extended period by partially offsetting influences. Workload decreases have resulted from program adjustment throughout the Defense establishment incident to the winding down of military operations in Southeast Asia. At the same time, however, workload increases have evolved from new missions and growing reliance by the military services on our support and services.

DIRECT SUPPORT OF COMMISSARIES IN EUROPE

Chairman ELLENDER. Will you give us specific examples of that?

General ROBINSON. Yes, sir. We have recently assumed a new position of supporting commissaries in Europe on a direct support basis. This involves the transfer of some additional resources to the Defense Supply Agency, and it resulted in our having a responsibility which we had not heretofore had.

Chairman ELLENDER. Why did you take that over? That is not connected with the Army or Air Force except as a fringe benefit to them. Do they pay the additional cost?

General ROBINSON. Generally speaking, sir, the costs to operate commissary stores are financed from appropriated funds, but the goods they handle are paid for by the customer. The commissaries had previously been serviced by depots in Europe which were supplied from Defense Supply Agency procurements in the subsistence area.

In an effort to shorten the pipeline and reduce the inventory, we are providing support directly to the commissary, which results in a savings.

Chairman ELLENDER. You indicated that commissary costs are chargeable to the government?

General ROBINSON. Not completely, sir. The Defense Department procurement and supply distribution systems also support the commissaries. The commissaries use foods and subsistence items of all types that are procured through our revolving stock fund.

Chairman ELLENDER. But sold to the military?

General ROBINSON. Yes, sir.

PROGRAM SAVINGS TO MILITARY PERSONNEL AND GOVERNMENT COST

Chairman ELLENDER. Could you give us an idea of what the savings are to the military personnel and what is the cost to the Government?

General ROBINSON. In going into this direct support, Mr. Chairman, the estimates have been in the neighborhood of $6 million that have been saved in pipeline costs and storage costs on subsistence items as of the time our system went into effect, and there will be some continuing savings in this area by not having warehouse people.

Chairman ELLENDER. Savings to whom?

General ROBINSON. Savings to the Government.

Chairman ELLENDER. How much does it cost the Government to handle commissary activities?

General ROBINSON. I would like to provide that for the record.

Chairman ELLENDER. I wish you would. Why should we continue all of these fringe benefits when we have increased salaries so much? I think we have gone too far now and that something has to be done, General, to save costs somewhere.

I wish you would give us an idea of what it has cost the Federal Government to operate these commissaries for the last 3 years.

General ROBINSON. We will be glad to give you what we can, Mr. Chairman. We don't operate the commissaries in the Defense Supply Agency. These are operated by the military services.

Chairman ELLENDER. I understand that. What are your costs as against the cost of the others?

General ROBINSON. We will be happy to provide that.

(The information follows:)

ANNUAL COSTS

	Operating funds	Stock fund	Total
Previous costs	$5,905,525	$9,709,920	15,615,445
Current system costs	4,641,535	4,114,600	8,756,135
Savings	1,263,990	[1] 5,595,320	6,859,310

[1] 1-time inventory savings.

AGENCY MILITARY PERSONNEL

Chairman ELLENDER. How many military personnel have you engaged in the work of the Defense Supply Agency?

General ROBINSON. There are 1,100 military personnel programed for 1973, of which 141 are enlisted, sir, for the whole activity.

Chairman ELLENDER. And the rest are officers?

General ROBINSON. Yes, sir.

OFFICER RANKS

Chairman ELLENDER. Will you tell us the ranks of those officers?

General ROBINSON. Yes, sir. We have one lieutenant general, myself; 12 major generals authorized, which includes rear admirals; seven brigadier generals, 187 colonels and captains, 389 lieutenant colonels and commanders, 277 majors or lieutenant commanders, 123 captains and lieutenants, 16 first lieutenants and lieutenant junior grades in the Navy, and 10 warrant officers.

AUTHORIZED RANK STRUCTURES

Chairman ELLENDER. If you need an officer to handle a certain area of work, how do you go about securing that officer?

General ROBINSON. I request an officer to fill an authorized billet from the military services, and I furnish those military services a description of exactly what he has to do and what background we feel he ought to have.

Chairman ELLENDER. Who determines the ranks of the officer?

General ROBINSON. That is determined in our authorized rank structure. Then the services provide the rank that we request. If they cannot provide the rank, they request us to take a substitute, in which case sometimes we are able to and sometimes we are not.

ENLISTED PERSONNEL

Chairman ELLENDER. You have 141 enlisted men. What kind of work is given to them?

General ROBINSON. Most of them are in an NCO logistics program. The services desire to have these people rotate through Defense Supply Agency and in their jobs to maintain a balanced rotation for these men and also to give them training, to assist in their retention by giving them their tour of duty, and to allow them to be maintained in logistics management. Some of the NCO's are in supply operations. Many of them are in inventory management. Most of them are in warehousing. We have some in contract administration and some in telecommunications and that type of thing, sir.

CHAUFFEURS

Chairman ELLENDER. Do you have any chauffeurs?

General ROBINSON. Yes, sir. We have eight drivers throughout the agency.

CIVILIAN PERSONNEL

Chairman ELLENDER. How many civilians do you have?

General ROBINSON. 46,300. That is in the O. & M. appropriation only. In addition, we have 1,650 under the industrial fund in Philadelphia and 475 in R.D.T. & E.

Chairman ELLENDER. What is their function?

General ROBINSON. These people would be in the inventory control points, our defense supply centers and service centers. They would be in our warehousing operations, depots, shipping, receiving. They would be in administrative positions, supervisory positions, management positions, and the like, and in contract administration.

Chairman ELLENDER. Are the warehouses owned by the Government?

General ROBINSON. Yes, sir.

Chairman ELLENDER. Is that funded under this appropriation?

General ROBINSON. We operate those warehouses under the O. & M. appropriation.

Senator YOUNG. Before you leave the subject of personnel, may I ask one question. Are these civilians under civil service?

General ROBINSON. Yes, sir; these are all on civil service.

Senator YOUNG. In foreign countries, too?

General Robinson. We have 18 foreign nationals, 17 in Canada, and one in Belgium, sir.

Senator Young. Thank you.

REPAIR OF FACILITIES

Chairman Ellender. Are all of the repairs on the facilities you own or use done inhouse?

General Robinson. No, sir. Our day-to-day repairs are done inhouse. Some of the repairs are done under contract, if that is the most appropriate way to do it based on the work required.

Chairman Ellender. Would such work be funded under the O. & M. appropriation?

General Robinson. Yes, sir.

Chairman Ellender. You say some of your building maintenance is done under contract.

ALLOCATION OF FUNDS

General Robinson. In the category of maintenance in fiscal year 1973 we are asking for $6.6 million; in the category of repair, $2.5 million; minor alterations and construction, $500,000.

Chairman Ellender. You have three classifications there. Will you tell us the difference?

General Robinson. Maintenance, sir, has to do with the utility costs and the day-to-day operation of the utility plants, the day-to-day maintenance of the grounds and roads, and things of that nature.

REPAIRS

Chairman Ellender. Does that involve repairs?

General Robinson. Not of a specific nature. Repair would be restoring the facility, such as the repair of doors or minor repair to roofs, patching roads.

Chairman Ellender. Do you have a special item for that?

General Robinson. That is under the item of repair of $2.5 million for the agency.

MAINTENANCE

Chairman Ellender. Please speak to the other repair and maintenance.

General Robinson. That is $6.6 million.

Chairman Ellender. Is that let by contract?

General Robinson. No, sir. Most of this is done inhouse. Some of this would be under contract, approximately $0.9 million would be small local contracts and $5.7 million inhouse.

Chairman Ellender. Of the $6.6 million?

General Robinson. Yes.

MINOR ALTERATIONS AND CONSTRUCTION

Chairman Ellender. Would this involve major repairs?

General Robinson. I would think of the $2.5 million some would be under contract. It would be classified as major repair.

Chairman Ellender. Are these contracts let by bid?

General Robinson. Yes, sir; they would be let by bid locally.

Chairman Ellender. Proceed.

1972–1973 WORKLOAD INCREASES AND PERSONNEL DECREASES

General ROBINSON. The predominance of the decrease influences abated in the latter part of fiscal year 1971 with workloads leveling off higher than forecasted. This pattern has continued. As a result, the fiscal year 1972 workloads are running about 3 percent higher than anticipated in the budget request for fiscal year 1972 and all indications portend that the fiscal year 1973 workloads will be about 1 percent higher than anticipated in this budget request.

Notwithstanding workloads higher than anticipated, fiscal year 1972 end-year employment is being adjusted to the levels contemplated in the fiscal year 1972 appropriation, as enacted, and the levels planned in the President's current budget request. This will place fiscal year 1972 end-year civilian employment for general DSA operations at 46,300, which is down 1,953 from the end fiscal year 1971 level. The President's budget provides for fiscal year 1973 end-year civilian employment at the same level.

CIVILIAN EMPLOYEE GRADES

Chairman ELLENDER. I wonder if you could give us an idea of the classifications of your civilians. How many have you in, let us say, the highest bracket?

General ROBINSON. In the grade structure, the highest civilian is GS–18. We have one in the Defense Supply Agency.

Chairman ELLENDER. Will you go down the list until you get to the lowest classification bracket?

General ROBINSON. Yes, sir; down through GS–1.

Chairman ELLENDER. I would like to know what it is that the military personnel do that could not be done by civilians.

General ROBINSON. I planned to do it later, but I will be glad to do it now.

(The information follows:)

SUMMARY OF PERMANENT CIVILIAN POSITIONS

General schedule grades	Fiscal years—		
	1971 number	1972 number	1973 number
GS–18	1	1	1
GS–17	5	5	5
GS–16	15	15	15
GS–15	297	300	290
GS–14	647	642	629
GS–13	1,920	1,747	1,640
GS–12	4,063	3,651	3,422
GS–11	7,145	6,511	6,331
GS–10	198	178	148
GS–9	7,037	6,324	6,043
GS–8	294	267	269
GS–7	2,728	2,741	2,667
GS–6	1,303	1,357	1,679
GS–5	4,781	4,852	5,150
GS–4	5,251	5,294	5,415
GS–3	2,304	2,310	2,469
GS–2	253	255	276
GS–1	42	42	43

1969–1970 CIVILIAN EMPLOYEE REDUCTION

Chairman ELLENDER. Proceed.

General ROBINSON. Fiscal year 1972 marks the completion of an extended period of significant employment adjustments due to workload decreases. In absolute terms, DSA civilian employment will have reduced during fiscal years 1969 through 1972 by 11,152. After consideration of personnel transfers to DSA incident to new missions and programs undertaken during this period, the effective reduction due to workload is 14,185, or 25 percent of the employment at the beginning of fiscal year 1969.

Chairman ELLENDER. You refer to civilians?

General ROBINSON. Yes, sir. Although workload has not decreased proportionately, we have managed to sustain high mission performance by productivity gains through operating improvements. As a result primarily of forward planning, we have achieved 89 percent of the employment reductions by attrition. To the extent that selective reduction-in-force procedures have been necessary, they have been limited to correction of imbalances resulting from the fact that attrition does not occur in the same pattern of skills and locations as the workload reductions.

MILITARY PERSONNEL

Another element of the DSA personnel program of interest to the Congress is the use of military personnel. To clarify the record on this matter, I would like to explain the concept under which DSA utilizes military personnel and trace briefly the status of our military strengths.

Since inception, DSA has operated with a small nucleus of military personnel in command, selected management, and specialized skill positions. This concept is designed to serve the following purposes:

Man the Agency in accordance with the DOD policies on military-civilian staffing.

Attain throughout DSA operations realistic understanding and appreciation of the military services' logistics needs and problems in peace and war through firsthand experience of personnel from these services.

Provide experience which enables military personnel to assume responsibilities necessary to maintain combat-related logistics support and services in future assignments.

Attain the special skills and knowledge acquired primarily through military training and experience to guide judgments and decisions regarding DSA operations.

Maintain effective interface with the military services in all aspects of DSA operations.

GOVERNING OF MILITARY STRENGTH BY SPECIFIC SKILL AND EXPERIENCE

Under this concept, DSA military strengths are governed by the needs for specific skills and experience in specific positions rather than fluctuations in workload and resultant civilian strengths. It has been our objective throughout application of this concept to keep the military personnel strengths to the minimum necessary to meet the purposes described above, and to effect reductions through internal improvements wherever possible.

The application of this concept is best evidenced by developments since fiscal year 1964. The principal influences on DSA total manning requirements since fiscal year 1964 have been the rise and fall in workloads incident to the Southeast Asia activities, the transfer of various missions and associated personnel from the military services to DSA, and reductions from methods improvements and organizational consolidations.

COMPARISON OF 1964–1972 MILITARY AND CIVILIAN STRENGTH INCREASES

Although DSA civilian employment increased some 44 percent incident to the Vietnam buildup, no increase in military personnel was made for this purpose. For missions transferred to DSA, the civilian strength has increased by 62 percent, whereas the military increase has been held to 38 percent. As a result of management improvements, military personnel have been reduced 22 percent since fiscal year 1964, which is greater than available data indicates that civilian personnel has been reduced from such actions.

Considering all influences, the net increase in DSA civilian employment between fiscal years 1964 and 1972 is 60 percent. In contrast, the increase in military personnal has been held to 16 percent. In fiscal year 1964 the ratio of military to civilian personnel was 3.3 percent; this ratio is currently 2.4 percent.

MILITARY PERSONNEL DECREASE

Chairman ELLENDER. I don't want to anticipate you. You had quite an increase in your civilian personnel. But how much have you decreased the military?

General ROBINSON. The decrease in the military has been very slight during that period because there was no increase made in the military at the time we built up the civilians.

I would like to add, sir, that there have been some management improvements made over the years which have also allowed us to reduce 221 military personnel.

Chairman ELLENDER. Since when?

General ROBINSON. Since 1964, sir.

1967–1972 CIVILIAN AND MILITARY PERSONNEL DECREASES

Chairman ELLENDER. How much have you cut back in the last 2 years through attrition?

General ROBINSON. In 1967 our civilian strength was 60,961. In 1972 our civilian strength is 48,425.

Chairman ELLENDER. Primarily, when did this cut take place?

General ROBINSON. It took place over the whole period of time, sir, 1968, 1969, 1970, 1971, and 1972. It is leveling off in 1973. It will be the same as 1972.

Chairman ELLENDER. When you made the largest civilian reductions, what action was taken in regard to the military personnel?

General ROBINSON. For the same period for military, sir, in 1967 we had 1,196 military. In 1972, we had 1,174.

Chairman ELLENDER. So you did not reduce them in the same proportion.

NET MILITARY REDUCTION RESULTING FROM MISSION INCREASE

General ROBINSON. That is the net, sir. We cut 81 due to reductions in workload and productivity increases. We had an increase of 59 due to mission transfers. So we did actually cut 81, although we had an increase in mission, which gave us more military authorization, so that the net figure we ended up with was 1,174, which is 22 less than the 1967 strength.

MILITARY-CIVILIAN BALANCE: REVIEW OF PRIORITIES

Chairman ELLENDER. Could you function with fewer military personnel than you now have?

General ROBINSON. In my opinion, sir, we have the proper relationship between military-civilian, and I feel we should not do with less military.

I have no doubt that in some areas we will find in review, and we are now doing this, that some military could and should—and it will be my intention—be replaced by civilians.

On the other hand, during this review we might well find some positions that are filled by civilians that should be filled by military, in which case we will review that situation, also.

But, by and large, I feel we are at about the proper ratio.

CIVILIAN-ORIENTED MILITARY POSITIONS

Chairman ELLENDER. One of the reasons I have asked you these questions relates to previous testimony. This testimony indicated that of the total military personnel in the Department of Defense only about 22 percent are engaged in combat related activities, the rest being in support and other activities. Testimony also indicated that in the RDTE area, for example, there were over 34,000 military personnel, of whom about 10,500 were officers. Since pay costs and related benefits comprise over half the Defense Department budget, this area must be considered if any substantial savings are to be made. I would hope that without decreasing our combat capability many civilian-oriented jobs in Defense, presently held by military personnel, could be allocated to civilians with resulting savings.

Proceed.

DOD MANNING POLICIES AND OBJECTIVES

General ROBINSON. The DSA concept for the use of military personnel is consistent with the Defense Department manning policies and objectives and has been proven sound in operations. We believe the record shows that DSA has applied this concept prudently, including avoiding growth during periods of general buildup and voluntarily relinquishing military authorizations where internal improvements permit. We believe, further, that continuation of this concept is vital to sustaining the effectiveness achieved in DSA operations.

1973 OPERATION AND MAINTENANCE ESTIMATES

Chairman ELLENDER. The first request is for $696,184,000 for "Operation and Maintenance," which is included in the total of $1,291.1 million request for "Operation and Maintenance, Defense Agencies."

The summary information in the justifications pertaining to this request will be included in the record.

(The information follows:)

DEPARTMENT OF DEFENSE

APPROPRIATION: OPERATION AND MAINTENANCE, DEFENSE AGENCIES, FISCAL YEAR 1973

PURPOSE AND SCOPE

The Defense Supply Agency was established by the Department of Defense on 1 October 1961 pursuant to authority vested in the Secretary of Defense and the provisions of the National Act of 1947 as amended.

The primary objectives of the Defense Supply Agency are: First, to insure effective and timely support of the operating forces in war and peace. Second, to furnish this support at the lowest practicable cost.

The budget estimate for the Defense Supply Agency for Fiscal Year 1973 supports the supply and service organizations which perform the functions assigned to the Agency, except for the Defense Documentation Center which is financed from Research, Development, Test and Evaluation funds.

The FY 1973 estimate provides for a net increase of $30.887 million from the adjusted FY 1972 estimate. The principal increase is annualization of classified and wage board pay rate changes with the remaining increases related to directed programs and other changes designed to improve productivity within DSA and the effectiveness of logistics support to the Military Services. The FY 1973 estimate also decreases related to modest workload reductions and productivity changes requiring that the high productivity rates achieved in FY 1972 not only be sustained, but that further improvements in FY 1973 be accomplished. Each area of increase or decrease is explained in subsequent justification by program element. The organization, functions, and representative workload for FY 1973 are:

Organizations	Functions	Annual workload indicators
Supply centers (6)	Procurement and inventory management of medical, fuel, and subsistence, clothing, general, industrial, contruction, and electronics material.	18,100,000 requisitions; $2,300,000,000 stock fund sales; $1,200,000,000 fuel procurements; $2,200,000,000 inventory; 1,700,000 items managed; 2,200,000 procurement line items awarded.
Supply depots (7)	Receipts, storage, and issue of DSA material.	17,500,000 line items received and shipped; 1,700,000 short tons received and shipped; 1,000,000 short tons in store.
Service centers (2)	Support of DOD-wide cataloging, inventory utilization, and surplus disposal programs at DLSC, and inventory management of industrial plant equipment at DIPEC.	700,000 catalog numbers added or deleted; $8,800,000,000 material utilization and disposal; $900,000,000 IPE inventory.
Contract Administration services (CAS regional offices (11).	Contract administration, quality assurance, production surveillance and industrial security.	166,700 contracts administered.
		$14,700,000,000 value of materiel inspect for shipment; 1,100,000 invoices paid.

DEFENSE SUPPLY AGENCY.—SUMMARY BY PROGRAM ELEMENT

[Millions of dollars]

	Actual Fiscal year 1971	Estimate fiscal year 1972	Estimate fiscal year 1973
Direct obligations:			
1. Inventory control points	71.043	74.845	76.043
2. Procurement operations	33.334	34.956	36.139
3. Supply depot operations	109.698	111.315	117.552
4. Contact administration services	262.977	253.960	266.711
5. Base operations	186.676	190.221	199.739
Total direct obligations	663.728	665.297	696.184

Defense Supply Agency

INVENTORY CONTROLS POINTS

Explanation of estimates.—The budget request of $76.043 million in this element is required for the DSA supply management and the logistics services missions at major supply centers. There are five major supply centers engaged in commodity management, stock control, cataloging and standardization missions. Also included are two field offices which support the supply centers by providing military service customer assistance liaison. That portion of the Defense Logistics Services Center operation previously included in this element is now reflected in the Base Operations element. The FY 1971 and FY 1972 direct obligations have been adjusted to reflect this change.

Comparative obligations.—(In millions of dollars):

Direct obligations for fiscal year 1971, $71.043; fiscal year 1972, $74.845; and fiscal year 1973, $76.043.

The Defense Supply Agency consistently strives to improve responsiveness to customer demands by increasing supply performance and effectiveness. This request requires continued improvement in systems and operations to meet military support requirements promptly and economically. The budget estimate of $76.043 million for fiscal year 1973 represents a net increase of $1.198 million over the fiscal year 1972 estimate due to the following changes:

Increases:	*(In millions)*
Fiscal year 1972 classified pay increase (annualized)	$2.210
Functional transfer—comissary support	.086
Health benefits (annualized)	.050
Parts control system	.197

PROCUREMENT OPERATIONS

Explanation of estimates.—The budget request of $36.139 million in this element is required for the DSA procurement operations at five major supply centers which are assigned the supply commodities of medical, subsistence, clothing and textiles, industrial, construction, electronics, and general supplies.

Comparative obligations.—(In millions of dollars):

Direct obligations for fiscal year 1971, $33.334; fiscal year 1972, $34.956; and fiscal year 1973, $36.139.

Justification of estimates.—These estimates require continued improvement in procurement systems and operations to meet military support requirements promptly and economically. The budget estimate of $36.139 million for fiscal year 1973 represents a net increase of $1.183 million over the fiscal year 1972 estimate due to the following changes:

Increases:	*(In millions)*
Fiscal year 1972 classified pay increase (annualized)	$1.020
Functional transfer—commissary support	.064
Health benefits (annualized)	.024
Environmental considerations	.300
Decrease:	
Productivity improvement	.225
Net increase	1.183

SUPPLY DEPOT OPERATIONS

Explanation of estimates.—This budget request of $117.552 million in this element is required for that portion of the Defense Supply Agency mission encompassing the receipt, storage, care, inventory, and issue of the commodities assigned to it for integrated wholesale management, including industrial plant equipment functions.

The organizations performing supply depot operations include:

Seven Principal Distribution Depots—responsible for the receipt, storage, care, inventory, and issue of DSA items of supply, including general mobilization reserve stocks for the support of specific areas and activities. Six of these depots are operated by DSA. The depot at Atlanta, Georgia, continues to be operated by the Department of the Army, subject to reimbursement from DSA for the warehouse handling costs in support of DSA inventories.

Four Specialized Support Depots—with functions similar to those of principal distribution depots, except that their missions are limited to type of material or scope of support. Two of these depots, DESC at Dayton, Ohio, and DIPEC at Memphis, Tennessee, are operated by DSA. The two depots at Norfolk, Virginia, and Oakland, California, continue to be operated by the Department of the Navy and the costs of their operation are included in the budget estimates of the Navy.

Direct Supply Support Points—to include supply and industrial installations of the Military Services, stock a selected range of DSA-owned inventory for the support of certain high volume demands generated by activities such as maintenance and rebuild shops, naval air stations, and naval shipyards. The cost for those operations remains in the budget estimates of the Military Services.

Other Service Operated Facilities—to include other service operated facilities which store DSA material. The Defense Supply Agency continues the attrition of stock at these depots where this is considered to be the most economical approach.

Comparative obligations.—(in millions of dollars):

Direct obligations for fiscal year 1971, $109.698; fiscal year 1972, $111.315; and fiscal year 1973, $117.552.

Justification of estimates.—This request requires continued improvement in systems and operations to meet military support requirements promptly and economically. The budget estimate of $117.552 million for fiscal year 1973 represents a net increase of $6.237 million over the fiscal year 1972 estimate due to the following changes:

	(In millions)
Increases:	
Fiscal year 1972 classified pay increase (annualized)	$. 700
Wage grade pay increase (annualized)	2. 567
Functional transfer—commissary support	1. 317
Health benefits (annualized)	. 079
Supplies and equipment	3. 000
Packing level operations	. 103
Packing, crating, handling, and transportation	. 960
Decreases:	
Workload reductions	1. 892
Productivity improvement	. 597
Net increase	6. 237

CONTRACT ADMINISTRATION SERVICES

Explanation of Estimates.—The budget estimate of $266.711 million in this program element is required for performing contract administration services at eleven Defense Contract Administration Services Regions (DCASRs) and the Defense Industrial Security Clearance Office. There are subordinate district and field offices under the jurisdiction of the DCASRs. The services performed cover the range of all responsibilities for procurement actions that are performed after contract award and certain functions before contract award. They include determination of Industrial Facilities support, Industrial Preparedness Planning, performance of pre-award surveys and review of contractor proposals accomplished prior to award. Also included: contractor performance surveil-

lance to assure compliance with provisions of the Armed Services Procurement Regulations (ASPRs); price and cost analysis; approval of contractor purchasing systems; termination of settlements; property administration and disposition; quality assurance; production surveillance; industrial labor relations; engineering support; transportation and packaging; industrial security; financial management; safety; and contract compliance reviews under the program for equal employment contracts compliance.

Comparative obligations.—(in millions of dollars):

Direct obligations for fiscal year 1971, $262.977; fiscal year 1972, $253.960; and fiscal year 1973, $266.711.

Justification of estimates.—The budget estimate of $266.711 million for fiscal year 1973 represents a net increase of $12.751 million over the fiscal year 1972 estimate due to the following changes:

	(In millions)
Increases:	
Fiscal year 1972 classified pay increase (annualized)	$7.222
Functional transfers	1.512
Health benefits (annualized)	.180
ADP rentals	.509
MILSCAP/MOCAS	3.481
Contract compliance	1.965
Performance measurement for selected acquisitions	.282
MK–48 torpedo program	.092
Probability of incurrence of estimated costs	.426
Contractor procurement system review	.427
Decreases:	
Workload reductions	1.906
Productivity improvement	1.439
Net increase	12.751

BASE OPERATIONS

Explanation of Estimates.—The budget request of $199.739 million in this element provides for agency and field activity level command direction, support functions such as automatic data processing operations, supply services, comptroller operations, civilian personnel administration, maintenance of real property, medical support, operations of utilities; property disposal operations, minor construction and engineering support functions at all major supply centers and supply depots; various logistic support activities such as Defense Fuel Supply Center, the Defense Logistics Services Center, and the DoD Value Engineering Service Office; field extension offices such as the inspector general field offices, regional audit offices, the Defense Systems Automation Office; and centrally funded support costs such as agency-wide communications and official mail.

Comparative Obligations.—(In millions of dollars):

Direct obligations for fiscal year 1971, $186.676; fiscal year 1972, $190.221; and fiscal year 1973, $199.739.

Justification of Estimates.—This request requires continued improvement in systems and operations to meet military support requirements promptly and economically. The budget estimate of $199.739 million for FY 1973 represents a net increase of $9.518 million over the FY 1972 estimate due to the following changes:

	(In millions)
Increases:	
Fiscal year 1972 classified pay increase (annualized)	$3.329
Wage grade pay increase (annualized)	.724
Functional transfer—commissary support	.098
Health benefits (annualized)	.128
Defense integrated data system	.822
Headquarters boston DCASR relocation	1.060
ADP rentals	3.422
Supplies and equipment	2.000
Decreases:	
Maintenance of real property	.600
Leased communications	1.286
Productivity improvement	.199
Net increase	9.518

DEFENSE SUPPLY AGENCY.—SUMMARY OF OBLIGATIONS BY ELEMENT OF EXPENSE

[In millions of dollars]

	Actual fiscal year 1971	Estimate fiscal year 1972	Estimate fiscal year 1973
Direct obligations:			
Personnel compensation and benefits	564.373	568.864	590.604
Travel and transportation of persons	8.038	9.259	9.213
Transportation of things	.670	.506	.461
Rents, communications, and utilities	33.074	35.164	38.248
Printing and reproduction	2.900	3.142	3.103
Other purchased services	31.482	31.105	32.423
Supplies and materials	20.808	16.780	20.752
Equipment	2.383	.477	1.380
Total direct obligations	663.728	665.297	696.184
Reimbursable obligations:			
Personnel compensation and benefits	30.936	31.125	29.362
Travel and transportation of persons	.442	.535	.469
Transportation of things	.42	.257	.238
Rents, communications, and utilities	1.818	1.997	1.137
Printing and reproduction	.156	.187	.160
Other purchased services	1.786	.496	.591
Supplies and materials	1.140	.946	.860
Equipment	.127	.293	.204
Total reimbursable obligations	36.447	35.836	23.021
Gross obligations	700.175	701.133	729.205

SUMMARY OF CIVILIAN PERSONNEL

Total number of permanent positions	46,955	44,973	44,973
Full-time equivalent of other positions	1,723	1,788	1,651
Average number of all employees	49,898	47,184	47,334
Average GS grade	8.18	8.03	7.88
Average salary of ungraded positions	8,417	8,880	8,880
Average salary GS positions	12,056	12,737	12,731

DEFENSE SUPPLY AGENCY—SUMMARY OF PERMANENT CIVILIAN POSITIONS

General schedule grades	Fiscal year— 1971 number	1972 number	1973 number
GS–18	1	1	1
GS–17	5	5	5
GS–16	15	20	20
GS–15	297	295	285
GS–14	647	642	629
GS–13	1,920	1,747	1,640
GS–12	4,063	3,651	3,422
GS–11	7,145	6,511	6,331
GS–10	198	178	148
GS–9	7,037	6,324	6,043
GS–8	294	267	269
GS–7	2,728	2,741	2,667
GS–6	1,303	1,357	1,679
GS–5	4,781	4,852	5,150
GS–4	5,251	5,294	5,415
GS–3	2,304	2,310	2,469
GS–2	253	255	276
GS–1	42	42	43
Ungraded positions	8,671	8,481	8,481
Total permanent positions	46,955	44,973	44,973
Unfilled positions—June 30	−504	−450	−450
Total permanent employment—end year	46,451	44,523	44,523
Temporary, part time, and intermittent employees	1,802	1,777	1,777
Total employment—end year	48,253	46,300	46,300

SUMMARY OF MILITARY PERSONNEL POSITIONS

	Fiscal years—		
	1971	1972	1973
Lieutenant general/vice admiral	1	1	1
Major general/rear admiral (upper half)	12	12	12
Brigadier general/rear admiral (lower half)	8	7	7
Colonel/captain	187	187	187
Lieutenant colonel/commander	390	389	389
Major/lieutenant commander	278	278	277
Captain/lieutenant	131	130	123
1st Lieutenant/lieutenant (junior grade)	16	16	16
Warrant officer	10	10	10
Enlisted personnel	139	141	141
Total	1,172	1,171	1,163

OPERATION AND MAINTENANCE, DEFENSE AGENCIES

General ROBINSON. For fiscal year 1972, DSA was appropriated $650.7 million within the "Operation and maintenance, Defense agencies" appropriation.

Classified employee pay increases enacted through last December and fiscal year 1972 locality wage pay adjustments increase this by $14.7 million. A decrease of $0.1 million associates with a transfer to the General Services Administration for leased space. This brings the revised fiscal year 1972 estimate to $665.3 million.

BUDGET REQUEST

The fiscal year 1973 "Operation and maintenance request is $692.2 million. The net change from the revised fiscal year 1972 estimate is an increase of $30.9 million, comprised of increases totaling $40.4 million and decreases of $9.5 million. Detailed explanation of the changes is provided in the budget request justification material. Briefly, they include: $18.2 million for enacted increases in classified and wage board pay and employee health benefits; $3.1 million to finance functions transferred to DSA, with the like amounts dropped from the budgets of the losing military services.

FINANCING OF FUNCTIONS TRANSFERRED TO AGENCY

Chairman ELLENDER. Will you be a little more specific as to this increase of $3.1 million to finance functions transferred to DSA? What are those?

General ROBINSON. The first one is the commissary direct support function, which I previously alluded to wherein 47 man-years, amounting to $1.5 million, was transferred to DSA. This, as I mentioned in my statement, has been dropped from the budgets of the losing military services.

In addition, there were several plant cognizance assignments transfered to the Defense Supply Agency for contract administration services, one of which was Bendix, for 2 man-years, and then there were some fuel terminals, and a Michigan Army missile plant, less than 1 man-year each. It totals 49 man-years.

DIRECT SUPPORT OF COMMISSARIES IN EUROPE: MILITARY PERSONNEL INCREASE

Chairman ELLENDER. When was that commissary function transferred to you?

General ROBISON. We took it over this year, sir, 1972.

Chairman ELLENDER. How many military personnel were added to provide for this function?

General ROBISON. I would like to furnish that for the record, sir. I believe it was practically none. We will furnish that.

Chairman ELLENDER. Very well. Did you say you added 47 civilians?

General ROBINSON. We needed 47 additional man-years in the civilian category. I will furnish the military personnel for the record.

(The information follows:)

Under the direct commissary support concept 133 civilian spaces were transferred to DSA in FY 1972. No military spaces were transferred to DSA but there were attendant military personnel savings in the Services.

PROGRAM INCREASES

Chairman ELLENDER. Proceed.

General ROBINSON. $10.1 million for further progress in certain directed programs. Principal items include $4 million for implementation of the DOD-wide military standard contract administration procedures (MILSCAP) on October 1, 1972; $2 million for growth in the contract compliance program consistent with guidelines established by the Office of Federal Contract Compliance of the Department of Labor; and $1.5 million for increased ADP rentals and annualization of programing and systems analysis efforts begun in fiscal year 1972, related to the defense integrated data system (DIDS) which is scheduled for implementation in September 1974. The $2.6 million balance related to refinements in several programs to meet specific effectiveness and economy objectives. Examples include measures to improve evaluation of contractors' price proposals and exercise surveillance over cost developments after contract award.

OPERATIONAL IMPROVEMENTS

There are $9 million for improvements in DSA operations; $5 million of this is needed to replenish operating supplies and replace uneconomical equipment. As I mentioned earlier fiscal year 1972 workloads are about 3 percent higher than contemplated in the President's budget. This has necessitated sustaining average employment as long as practicable during the year to perform the additional workload. The financng of this unprogramed effort required that certain supplies replenishment and equipment replacement be deferred: $1.1 million is for leasing costs associated with relocating the headquarters of the Boston Defense Contract Administration Services Region from the significantly substandard facilities in which they are now located; $2.5 million is for the standard automated materiel management system (SAMMS).

The balance of $0.4 million is for increases in the level of effort in programs offering good return on the investment.

DECREASES

The decreases of $9.5 million include $7.6 million which relates to workload and productivity levels. Since current developments indi-

cate that demand workload will not decrease to the extent anticipated a few months ago, the unprogramed fiscal year 1973 workload of about 1 percent will have to be accommodated by further increases in productivity. The remaining decreases relate to $1.3 million in leased communication costs because of terminal equipment procurements and $0.6 million reduction in facilities maintenance since the backlog is nearing a more manageable level.

OTHER APPROPRIATIONS

Before closing, I would like to touch briefly on the DSA fiscal year 1973 budget requirements in appropriations other than operation and maintenance.

PROCUREMENT

Chairman ELLENDER. The summary statements in the justifications pertaining to the $8,392,000 requested for procurement for the Defense Supply Agency will be included in the record.

(The information follows:)

OFFICE OF THE SECRETARY OF DEFENSE

APPROPRIATION: PROCUREMENT, DEFENSE AGENCIES FISCAL YEAR 1973

The supply, storage and distribution, and the contract administration services activities of the Defense Supply Agency require the following type of equipment:

a. Mobile, Powered Materials Handling Equipment.
b. Mechanized Material Handling Systems.
c. Miscellaneous Warehouse Equipment.
d. Automotive Vehicles.
e. Automatic Data Processing Equipment.
f. Communications Equipment.
g. Office Equipment.
h. Other major equipment, including Construction and Allied Maintenance Shop and Laboratory Equipment.
i. Industrial Facilities Equipment.

[In thousands of dollars]

	Fiscal years—		
	1971 program	1972 program	1973 estimate
71111S—Supply depot operations	882	2,657	3,866
72896S—Base operations	690	6,032	4,165
72039S—Directorate of manufacturing (clothing factory)	146	150	361
Total	1,718	8,839	8,392

FISCAL YEAR 1973 PROCUREMENT PROGRAM

PROCUREMENT, DEFENSE AGENCIES

[In thousands of dollars]

Line number and item nomenclature	Unit cost	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
		Quantity	Amount	Quantity	Amount	Quantity	Amount
1—Mobile materials handling equipment			136		1,782		2,216
2—Automotive vehicles			297		417		279
3—Mechanized material handling system			606		500		1,550
4—Automatic data processing equipment					695		3,036
5—Other major equipment			92		268		643
6—Items less than $500,000 each			587		5,177		668
Total DSA program			1,718		8,839		8,392

PROCUREMENT, DEFENSE AGENCIES

General ROBINSON. In the DSA portion of the appropriation Procurement, Defense Agencies, we are requesting $8.4 million for a procurement program which includes materials handling systems and related equipment, automatic data processing equipment, automotive vehicles, communications support, some office and maintenance equipments, and replacement of outdated equipment at the defense clothing factory.

Chairman ELLENDER. How much of this equipment is outdated?

General ROBINSON. Well, sir, we are replacing $2.2 million in mobile powered equipment, such as forklifts, stock electric trucks and transporters, $0.3 million in vehicles and $0.2 million in office equipment, which means $2.7 million is in replacement of equipment that is beyond economical repair.

NEW EQUIPMENT

We have requested some new equipment amounting to $5.3 million.

Chairman ELLENDER. Of what type is that equipment?

General ROBINSON. Mechanized material handling system, packaging and marking system at Memphis, and at Ogden, communications equipment, closed circuit TV for drug surveillance, closed circuit TV for handling followup requisitions at Richmond. Some construction, maintenance, shop and lab equipment, ADP power system, a refuse shredder at Richmond and, also, at Tracy, Calif. and Ogden.

This type of material adds up to $5.3 million sir.

Chairman ELLENDER. That is new equipment?

General ROBINSON. That is new equipment which will allow us to improve the way we do things.

DEFENSE CLOTHING FACTORY

I mentioned the defense clothing factory. We have $0.4 million in the procurement budget for replacement of some outdated equipment in the defense clothing factory in Philadelphia primarily for manufacturing uniforms.

Senator YOUNG. Mr. Chairman, I would like to ask a question. How big an operation is the manufacturer of uniforms?

General ROBINSON. We manufacture uniforms, Senator, for all of the military services. We either manufacture or we procure them commercially. I would like to furnish for the record what exactly our production figures are. The factory, of course, is used to maintain our production base. It is also used for surge requirements where we need some uniforms either in smaller quantities or quicker than we can get them when we go out on contract.

But, generally speaking, most of the uniforms of all of the services are procured on contract. The factory principally manufactures uniforms to the extent of their capability to maintain production base.

I would be glad to provide for the record what our production figures were out of the factory what percentage that was of the whole.

(The information follows:)

Total clothing procurement was $363 million, clothing factory production was $15 million, clothing factory production was 4.13 percent of total procurement.

Factory Personnel

Senator Young. How many military and civilian personnel are employed in this activity?

General Robinson. 1,650. There are no military.

Chairman Ellender. That facility is located in Philadelphia?

General Robinson. Yes.

Uniform Manufacture: Contract and Factory Costs

Chairman Ellender. You make all officer uniforms?

General Robinson. No, sir. We make all types of uniforms, essentially enlisted personnel uniforms and certain types of equipment.

Chairman Ellender. I thought you said most uniform manufacture was procured under contract.

General Robinson. Most of the uniforms are under contract. There are certain items which are either small quantities or we need them in a hurry or they are special types of things, such as women's uniforms, and we maintain the capability of this factory to provide us with surge requirements in case of emergencies, also.

Chairman Ellender. Would you provide for the record the difference in cost of clothing that is made under Government contract as compared to the cost of that made in Philadelphia?

General Robinson. Yes, sir; I will furnish that for the record.

(The information follows:)

COST COMPARISON BETWEEN TYPICAL ITEMS MANUFACTURED IN THE CLOTHING FACTORY AND IDENTICAL ITEMS OBTAINED FROM COMMERCIAL CONTRACTORS

Item	Clothing factory		Lowest commercial bid		Unit cost difference
	Units	Unit cost	Units	Unit cost	
Shirt cotton poplin	39,000	$4.62	314,000	$2.81	$1.81
Shirt utility cotton sateen	284,000	3.05	2,000,000	1.365	1.685
Cap garrison	140,000	1.32	1,113,000	.76	.56
Coveralls utility nuclear submarine	15,000	19.13	50,000	15.556	3.574
Coveralls flying fire resistant	68,000	42.21	[1] 47,000	35.89	6.32

[1] Example of contractor slippage in delivery which has required expansion of factory production to reduce supply deficiency.

A direct comparison of cost to produce a given item in the Clothing Factory versus commercial procurement is not fully representative because of production methods. A commercial supplier will have an entire factory engaged in the fabrication of shirts or trousers or coveralls, etc., and will bid on large quantities which will be produced without interruption. However, the Clothing Factory must maintain simultaneous production of certain critical items to be responsive to unexpected and short notice requirements imposed by supply shortages. The quantities on a given Project Order are relatively small to meet the immediate demand. The smaller the quantity, the higher the unit cost. Interruptions and size changes to the production lines occur when necessary to satisfy higher priority requirements. This also increases unit cost.

Processing of Cloth and Supply to Contractors

General Robinson. I also would like to add that we process the cloth that we furnish to the contractor so that the Government can furnish the material to the contractors to make the uniforms. This is another function of the factory, sponging of cloth to insure proper finish and luster.

EQUIPMENT REPLACEMENT AND ECONOMIC BUYS OF LEASED EQUIPMENT

In the main, the equipments are replacements for overage items with excessive maintenance costs, or economic buys of leased equipments. In these latter instances, rental reductions have been made in our operation and maintenance budget request.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Chairman ELLENDER. The summary tabulation on page 262 of the justifications listing each of the projects included in the request of $12,870,000 for "Research, Development, Test, and Evaluation" will be included in the record.

(The information follows:)

DEFENSE SUPPLY AGENCY—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE AGENCIES
PROJECT LISTING: PROGRAMWIDE MANAGEMENT AND SUPPORT

[In thousands of dollars]

Element code	Project No. and title	Fiscal year— 1971 actual	1972 estimate	1973 estimate
65801S	1.0 Management information services	753	930	1,089
	2.0 Technical report services	4,961	4,677	4,812
	3.0 Development	1,059	2,115	1,544
	4.0 System maintenance and operational improvement	1,058	1,094	1,068
	5.0 Management and support	2,671	2,646	2,257
	6.0 Support of non-DDC activities	12	75	119
	Subtotal, gross	10,514	11,537	10,889
	Less reimbursements	12	75	119
	Subtotal, direct	10,502	11,462	10,770
65802S	1.0 Information analysis centers [1]		1,900	2,100
	Total direct	10,570	13,362	12,870

[1] These centers were previously funded in fiscal year 1971 and prior within the Navy and Air Force R.D.T. & E. appropriations as explained in the narrative justification.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION DEFENSE AGENCIES

General ROBINSON. In the appropriation for "Research, Development, Test and Evaluation, Defense Agencies," DSA is requesting $12.9 million to finance the scientific and technical information services of the Defense Documentation Center and eight DOD Information Analysis Centers. This reflects a $0.5 million reduction from fiscal year 1972 levels which results from improvements in the operation of the Defense Documentation Center. Discounting the influence of the January 1972 civilian pay raise, this is an effective reduction of $0.7 million in fiscal year 1973.

DEFENSE DOCUMENTATION CENTER: LIBRARY OF R. & D. PROJECTS AVAILABLE TO AUTHORIZED CUSTOMERS

Chairman ELLENDER. Please describe the activity of the Defense Documentation Center.

General ROBINSON. It maintains a library of research and development projects that have been completed, those which are in progress and those which are planned. These reports are available to authorized customers on request either in hard copy form, but mostly in microfiche.

Service Charges

Chairman Ellender. Do you charge for this service?

General Robinson. There is a service charge connected with both the hard copy and microfiche, yes.

Chairman Ellender. How much do your receipts total annually?

General Robinson. I would have to furnish that for the record.

Chairman Ellender. What becomes of that money?

Mr. Baker. It is offset against our appropriation cost, Mr. Chairman. We have a total program, of which a part is reimbursable.

Chairman Ellender. To whom are these documents sold?

General Robinson. Mainly to all Government agencies, but to authorized contractors of Government agencies.

Chairman Ellender. Can you give us an idea of how much you sell on a reimbursable basis and what becomes of the money?

General Robinson. I would like to furnish that for the record.

(The information follows:)

The fees are as follows: hard copy, $3.00; microfiche, $.35 or $.95. The same fees are charged to all users including contractors since these contractors are directly involved in Defense RDT&E efforts and are authorized to use DDC products. For FY 1973 these fees will generate approximately $.400 million which will be used to offset appropriation requirements.

Duplication Elimination

General Robinson. I would like to add that the Defense Documentation Center has as its purpose the elimination of duplication. That is the purpose of this particular library.

Chairman Ellender. Would you describe to what degree the center is involved in research and development, recordkeeping activities, and the like?

General Robinson. The question of what research has been completed, what is ongoing and what is planned, and what are kept in DDC. All of the Defense agencies are supposed to send to us this material.

Magnitude of Defense Documentation Center Activity

Chairman Ellender. How large are the Defense Documentation Center's files insofar as they relate to on-going research projects?

General Robinson. There are approximaely 19,000 on-going research and technology projects on file at DDC.

Bibliographies of Technical Reports

Chairman Ellender. What is the scope of the work done there? For instance, we developed the C–5A, a new tank, the F–14. Would you have a record of what has been accomplished?

General Robinson. We would be able to give you a bibliography of every technical report that was made on a given research project.

Chairman Ellender. What advantage accrues from that?

General Robinson. This allows people who are in the business of research to find out what other people have done in areas they are interested in, sir.

Chairman ELLENDER. Is this material made available to those outside the Defense Department?

General ROBINSON. To those contractors who are authorized by the military to use these bibliographies, yes, sir.

PROGRAM COST AND JUSTIFICATION ENLARGEMENT

Chairman ELLENDER. That service costs us $10.9 million. I would like you to amplify on that as to why you should be spending that amount of money. Is this function performed by civilians?

General ROBINSON. This is a civilian organization. It is run by a civilian who works for DSA.

I would like to add, to give you a feel of what we are talking about. In fiscal year 1972 we anticipate a technical report input of 40,000 reports. We anticipate distribution of 343,000 reports against individual requests and an automatic technical report distribution of 318,000 reports. Other workloads are: Primary distribution of 20,000 technical reports; preparation and distribution of 24,000 bibliographies; and about 13,000 requests for planned and on-going R. & D. These are the levels that we expect to experience in 1972, and we expect essentially the same in 1973.

We will be pleased to amplify the record to make it more clear.

Chairman ELLENDER. I wish you would, to justify the existence of this organization.

(The information follows:)

Of the $12.9 million requested, $10.9 million is for the Defense Documentation Center for completion of the workloads mentioned above. Of this amount, $7.4 million is for pay of required civilian personnel. The additional funds are for rents, communications, and other supplies and material required for the computerized facility at the Defense Documentaton Center. The technical reports on completed research at DDC provide detailed documentation to support follow-on or related work. The information on on-going work is used to coordinate programs with other DoD components to avoid duplication of effort, and to determine whether specific areas of endeavor adequately reflect DDR&E policy guidance. The system enables the individual bench scientist or engineer to keep up-to-date regarding the approach and current status of efforts related to his own work, and informs him about other scientists and engineers who can be contacted for further technical information. Additionally, the system is used to satisfy requirements for reports such as those needed by the National Science Foundation and the Science Information Exchange, as well as a variety of special one-time reports, including Congressional requests. The information on planned R&D, which gives the objective, plans for the budget year and subsequent year, and past progress for each project and task, is used to support preparation of the budget and program execution authorizations. This information assists DDR&E and the Services in making decisions on the entire RDT&E budget and program.

MILITARY CONSTRUCTION

Chairman ELLENDER. Proceed.

General ROBINSON. The "Military construction, Defense agencies" appropriation includes $7 million for projects at DSA field installations.

Finally, the appropriation "Family housing, Defense agencies" includes $143,000 for operating expenses of housing units for military families at DSA installations.

HOUSING INSIDE AGENCY INSTALLATIONS

Chairman ELLENDER. What is your function in that activity?

General ROBINSON. We would handle the housing inside of our installations.

Chairman ELLENDER. Is this housing for military personnel?

General ROBINSON. Yes, sir. These are for military personnel. We have 78 units of housing distributed among seven of our installations, the most of which are 31 at Defense General Supply Center in Richmond, and 24 in the Defense Depot, Ogden, Utah.

Chairman ELLENDER. What is done about civilian personnel?

General ROBINSON. They live in the civilian community, as do many of the military, sir.

Chairman ELLENDER. Does this activity provide for all of the military personnel that you have?

General ROBINSON. No, sir; it does not. It only takes care of some of them.

ALLOWANCE—HOUSING COST VARIANCE

Chairman ELLENDER. I thought military personnel were given an allowance for housing.

General ROBINSON. Yes, sir. Those for which no Government housing is available do get a housing allowance that they use to provide themselves with housing in the local community.

Chairman ELLENDER. These personnel are not able to do that?

General ROBINSON. These would not get their allowance if they are furnished Government quarters.

Chairman ELLENDER. What does it cost the Government to sustain a military man where you furnish the housing in contrast to where you give him the allowance?

General ROBINSON. I will be glad to put a comparison with respect to our housing in the record, sir.

Chairman ELLENDER. I would also like to have the cost or benefit to a colonel who has an allowance and uses that for a home, whereas you say you have some who can't obtain it and you provide it. What is the difference in that cost to the colonel who can get housing outside?

General ROBINSON. It works a little differently, however——

Chairman ELLENDER. I know it does. That is what I want to find out.

General ROBINSON. By that I mean we make sure that any housing we already have on the base is filled to capacity so that we withdraw from that service personnel all of his allowance and that house doesn't go empty.

However, to the extent beyond the number of houses available then the rest of the military go out and find their own housing and they do get the allowance.

Chairman ELLENDER. There must be a difference in the cost.

General ROBINSON. Yes, sir; there would be a difference in the cost to the Government, and that is what we will try to make an analysis of for the record, sir.

(The information follows:)

BASIC ALLOWANCE FOR QUARTERS (BAQ) FORFEITED

Rank	Number	Annual BAQ
O-8	1	$3,456
O-7	3	10,368
O-6	20	61,992
O-5	19	54,446
O-4	14	36,187
O-3	10	23,472
W-2	1	2,084
E-9	2	4,420
E-7	5	9,684
E-6	3	5,400
Total	78	211,509
Cost to operate 78 family housing units		143,000
Difference		68,509

If these 78 officers were not occupying these quarters they would be paid $211,509 as an alowance to obtain quarters on the economy. The budget cost of $143,000 to operate these quarters represents a reduced cost to the Government of $68,509 annually.

ANALYSIS AND EVALUATION OF BUDGET REQUESTS

Chairman ELLENDER. Proceed.

General ROBINSON. Mr. Chairman, this completes my presentation of the Defense Supply Agency fiscal year 1973 budget request. The request represents the result of a most thorough analysis and evaluation process aimed at austere but adequate resourcing for essential support to the military services. In light of more recent developments indicating that demand workloads will exceed the levels on which this request was based, we are, indeed, faced with austere resourcing and a challenge for the utmost in productivity. I would be pleased to respond to any further questions the committee might have.

Chairman ELLENDER. Do you have any further questions?

Senator YOUNG. No.

Chairman ELLENDER. Thank you.

We will take a recess in order to vote.

(Brief recess.)

Defense Contract Audit Agency

STATEMENT OF WILLIAM B. PETTY, DIRECTOR

ACCOMPANIED BY:
BERNARD B. LYNN, DEPUTY DIRECTOR
HARRY W. KETTLES, DEPUTY FOR RESOURCES MANAGEMENT

BUDGET REQUEST: OPERATION AND MAINTENANCE DEFENSE AGENCIES

Chairman Ellender. The subcommittee will come to order.

The next item to be considered is that for the Defense Contract Audit Agency, which is contained in the appropriation for "Operation and Maintenance, Defense agencies." For fiscal year 1973, the request is for $57,853,000, an actual increase of $973,000 over the $56,880,000 provided for fiscal year 1972.

The summary information on pages 1 through 7 of the justifications will be included in the record.

(The information follows:)

DEPARTMENT OF DEFENSE

APPROPRIATIONS OPERATION AND MAINTENANCE, DEFENSE AGENCIES, FISCAL YEAR 1973

PURPOSE AND SCOPE

This Agency falls within Budget Activity 9 "Administration and Associated Activities." The FY 1973 estimate provides the funds required to finance the operation of the DCAA Headquarters staff and the contract audit activities of the seven regions which have been established to carry out the missions and functions of the Agency.

The purpose of contract auditing is to assist in achieving the objectives of prudent contracting by providing those responsible for procurement and contract administration with financial information and advice on proposed or existing contracts and contractors. The audit service of the Defense Contract Audit Agency is utilized by procurement and contract administration activities in connection with the negotiation, administration, and settlement of contract payments or prices which are based on cost (incurred or estimated) or on cost analysis.

The Agency is also responsible for providing contract audit service to other Government agencies. The National Aeronautics and Space Administration uses many of the contractors who also provide service and equipment to the Department of Defense. There are resident audit offices in many of these contractors' plants, and DCAA has been authorized to provide contract audit service to the Space Agency at the same level as it provides such service to the Department of Defense. Similarly, DCAA audits contracts and grants for the Department of Health, Education and Welfare. The Agency also provides contract audit services to some 19 other Federal departments and agencies. The most significant are the Office of Economic Opportunity, the Atomic Energy Commission, the National Science Foundation, the Department of Transportation, and the Department of State. The general policy is that audit work is provided to non-Defense agencies on a reimbursable basis, in those contractor situations where DCAA maintains audit cognizance because of a continuing DoD interest, or where it is economical and sensible from a Government-wide point of view.

The Defense Contract Audit Agency provides contract audit services to all Department of Defense components under uniform policies and procedures; there is uniformity in organizational structure, and DCAA provides an effective ar-

rangement under which contracting officers, defense contractors, and non-Defense agencies can deal with a single audit agency.

The FY 1973 estimates require $57,853,000 in direct funds, a net increase of $973,000 from the FY 1972 amount. The FY 1973 estimates reflect a 37 man-year reduction relating to a lower level of effort for pricing proposal evaluations, defective pricing reviews and incurred cost audits. This level of effort is consistent with overall Department of Defense plans which affect DCAA workload. The increase results primarily from the annualization of increased costs of the January 1972 pay raise (PL 92–210) and Health Benefits Insurance, the cost of normal within-grade step increases, and rise in costs caused by higher rates for mileage for official travel by privately owned vehicles and the Federal Telecommunications System (FTS). These increases are partially offset by a manpower reduction and the fact that there are two less paid days in FY 1973.

The FY 1973 funds will provide a total of 3,394 full-time permanent man-years compared with 3,431 in FY 1972 and 3,539 actually realized in FY 1971.

SUMMARY OF OBLIGATIONS BY SUBPROJECTS

[Dollars in thousands]

Subprojects and description	Fiscal year— 1971	1972	1973
Direct obligations:			
460 Headquarters, DCAA	$4,415	$4,857	$5,005
461 DCAA field activities	50,226	52,023	52,848
Total direct obligations	54,641	56,880	57,853
Reimbursable obligations:			
Contract audit services provided to other Government agencies	7,238	7,603	7,754
Miscellaneous reimbursements	5	0	0
Total reimbursable obligations	$7,243	$7,603	$7,754
Total obligations	61,884	64,483	65,607

SUMMARY OF PERSONNEL BY SUBPROJECTS

Subprojects and description	Fiscal year— 1971 Pos	1971 M-yrs	1972 Pos	1972 M-yrs	1973 Pos	1973 M-yrs
Full-time permanent personnel:						
460 Headquarters, DCAA	130	135	130	128	130	128
461 DCAA field activities	3,514	3,404	3,275	3,303	3,275	3,266
Total DCAA	3,644	3,539	3,405	3,431	3,405	3,394

Defense Contract Audit Agency

EXPLANATION OF ESTIMATES FOR HEADQUARTERS

Subproject 460 provides for the operation and maintenance expenses of the Headquarters, Defense Contract Audit Agency. It provides for: Salaries of civilian personnel; travel and transportation including permanent change of station costs; reimbursement to host activities for common service support; communication and postage costs; automatic data processing; and operating supplies and equipment. It also includes funds required for reimbursement to other Federal Agencies (DHEW, AEC, and Interior) for audit services provided to the Department of Defense.

The Agency headquarters and the seven regional headquarters are operated with restricted numbers of personnel. It is the function of the Agency headquarters to carry on all the work normally associated with the central office of a professional agency or activity, to furnish representation and counsel to all activities requiring contract audit participation at the seat of Government, and to prepare and promulgate all directive material needed for the conduct and management of the duties and affairs of the Agency. The Headquarters

provides both written and oral guidance to permit the field audit offices to do their work in a timely manner and to assure uniformity of treatment with respect to any given element of cost for all contractors. In addition to its operational function of supervision, direction and guidance to the field, the Headquarters organization includes the normal functions of legal counsel; review and evaluation; and management of resources including the recruitment and training of personnel.

Since the end of fiscal year 1970, the Agency's authorized Headquarters staff has been reduced from 150 authorized spaces to 130 as of July 1, 1971. This reduced level is considered to be the minimum necessary to effectively carry-out the Headquarters functions.

The primary items of increase are $107,000 for the annualization of increased costs of the January 1972 pay raise (PL 92-210) and Health Benefits Insurance, $28,000 for within-grade step increases and $35,000 for higher Federal Telecommunications System billings. These increases are partially offset by the two less paid days in FY 1973. Each of these items is a required obligation, outside the management control of this Agency.

TOTAL OBLIGATIONS

[Dollars in thousands]

DCAA headquarters	Fiscal year— 1971	1972	1973
Direct obligations	$4,415	$4,857	$5,005

SUMMARY OF PERSONNEL

DCAA headquarters	Fiscal year— 1971 Pos	1971 M-yrs	1972 Pos	1972 M-yrs	1973 Pos	1973 M-yrs
Civilian personnel	130	135	130	128	130	128

EXPLANATION OF ESTIMATES FOR FIELD ACTIVITIES

Subproject 461 provides for the operation and maintenance of the field activities of the Defense Contract Audit Agency.

The Defense Contract Audit Agency is divided into seven field regions with headquarters in Atlanta, Boston, Chicago, Los Angeles, New York, Philadelphia and San Francisco. The New York Region has responsibility for contract audit in Europe, the Near East and the Mediterranean Area; the Pacific and Far East areas (including Southeast Asia) are supervised by the San Francisco Region. The Agency's regions vary greatly in area but they are roughly similar in workload and responsibilities. Also supported under this subproject is the Defense Contract Audit Institute at Memphis, Tennessee.

The policy of DCAA is to place the responsibility for all audit work in the regions and field offices and to employ the maximum possible portion of the total force in direct audit work. DCAA auditors have their duty stations in four kinds of field audit offices—branch, resident, liaison and suboffices. As of December 31, 1971, there are 368 of these offices in the field, as well as the seven regional headquarters. At present, about eight of every nine personnel are assigned to resident, branch and suboffices.

Major resident offices are permanently located in the offices or plants of defense contractors, where the continuing volume of work requires full-time attention. There are now 88 such offices with staffs varying from ten to thirty or more auditors. Suboffices are those which are established in contractors facilities where the services of two to five auditors are normally required. There are 209 of these suboffices at the present time. The contractors whose Government volume is too small to justify permanent staffs are assigned to 45 branch offices located in major population centers throughout the United States and overseas. Their audit work is done on a mobile or itinerant basis. Liaison Offices are established at DoD procurement or contract administration offices to provide coordination and communication between procurement and contract audit activities. There are presently 26 of these offices with staffs ranging from one to five auditors.

In order to provide procurement and contract administration with the timely advice it needs to enter into or administer a contract, and at the same time carry out the Agency's assigned responsibilities within its resources, the following priorities have been established:

(1) Price Proposal Evaluation.
(2) Defective Pricing Audits (PL 87-653).
(3) Other direct work—other than Incurred Costs Audit (GAO Reports, Special Audits, etc.).
(4) Audit of Incurred Costs (with priority at this level to overhead audits).

This priority structure will continue during FY 1972 and FY 1973.

In FY 1971, 135 man-years (4.9% of the Agency's direct audit man-hours) were devoted to audit activity generated by PL 87-653 (The Truth in Negotiations Act). Since the inception of this program in FY 1966, recommended downward price adjustments have totalled more than $233 million, with about one-third of these recommended price adjustments being sustained in settlements negotiated by contracting officers. This work is considered very worthwhile, not only in savings but also in its influence on contractors to exercise greater care in preparation of price proposals. The Agency will continue, therefore, to expend approximately the same percentage of effort on audits required by PL 87-653.

The FY 1973 estimate reflects a 37 man-year reduction. To the extent that the Agency cannot accomplish all necessary work on a timely basis, the audit of incurred costs, priority 4 in the Agency's scheduled workload, will be deferred.

The $825,000 increase reflected in the FY 1973 estimate results primarily from the annualization of increased costs of the January 1972 pay raise (PL 92-210) and Health Benefits Insurance ($1,362,000) and within-grade step increases ($425,000). These increases are partially offset by a manpower reduction and the fact that there are two less paid days in FY 1973.

TOTAL OBLIGATIONS [DOLLARS IN THOUSANDS]

DCAA field activities	Fiscal year— 1971	1972	1973
Direct obligations	$50,226	$52,023	$52,848
Reimbursable obligations	7,243	7,603	7,754
Total obligations	57,469	59,626	60,602

SU MMARY OF PERSONNEL

DCAA field activities	1971		1972		1973	
	Pos	M-yrs	Pos	M-yrs	Pos	M-yrs
Civilian personnel	3,514	3,404	3,275	3,303	3,275	3,266

DEFENSE CONTRACT AUDIT AGENCY

SUMMARY OF TOTAL OBLIGATIONS BY ELEMENT OF EXPENSE

[Dollars in thousands]

Element of expense	Fiscal year— 1971	1972	1973
Direct obligations:			
Civilian personnel	$50,036	$51,887	$52,782
Travel of personnel	1,968	2,045	2,057
Transportation of things	138	140	140
Utilities and rents	175	195	195
Communications	523	604	639
Purchased equipment maintenance (commercial)	28	33	33
Printing and reproduction	48	53	53
Other purchased services	1,331	1,703	1,734
Other supplies	136	137	137
Equipment	258	83	83
Total direct obligations	54,641	56,880	57,853
Reimbursable obligations	7,243	7,603	7,754
Total obligations	61,884	64,483	65,607

SUMMARY OF CIVILIAN PERSONNEL BY GRADES

General schedule grades	Fiscal year— 1971	1972	1973
GS-18	1	1	1
GS-17	1	1	1
GS-16	9	9	9
GS-15	42	39	37
GS-14	205	195	190
GS-13	377	360	350
GS-12	760	724	698
GS-11	1,223	1,175	1,158
GS-10	1	2	2
GS-9	301	187	215
GS-8	6	5	5
GS-7	196	180	188
GS-6	43	40	40
GS-5	252	291	299
GS-4	179	158	162
GS-3	38	33	40
GS-2	0	0	5
Total	3,634	3,400	3,400
Foreign national (direct)	10	5	5
Grand total	3,644	3,405	3,405

NET INCREASE OVER 1972

Chairman ELLENDER. The principal witness will be Mr. William B. Petty, Director of the Agency.

You may proceed.

Mr. PETTY. I am pleased to appear before this committee in support of the appropriation request of the Defense Contract Audit Agency for fiscal year 1973. The funds supporting this agency are included in budget activity 9, "Administration and Associated Activities" of the appropriation "Operation and maintenance, Defense agencies."

This is an increase of $973,000 from fiscal year 1972 direct funding level of $56,880,000. This increase is the net result of annualization of the January 1972 civilian pay raise, Public Law 92-210 (+$1,434,000), increased health benefits insurance premium rates (+$35,000), the cost of normal within-grade step advancements (+$453,000), and other support costs (+$47,000), as offset by projected manpower reduction (—$593,000), two less paid days (—$365,000), and less overtime (—$38,000).

MAN-YEAR AND END STRENGTH REDUCTIONS

The fiscal year 1973 estimates reflect a 37 man-year reduction resulting from a lower level of effort for incurred cost audits.

The budget provides an authorized fiscal year 1973 end year level of 3,405 full-time permanent positions compared with 3,405 at end fiscal year 1972 and 3,644 at end fiscal year 1971.

SALARY INCREASES: 1972 HALF YEAR FUNDING AND 1973 WHOLE YEAR FUNDING

Chairman ELLENDER. How did you provide for the pay raise?

Mr. PETTY. This was a very large salary increase. As you will notice in the first paragraph, we mention the amount of $1,434,000, which is really, in effect, the most recent salary increase.

Chairman ELLENDER. And you added that to the budget request?

Mr. PETTY. We added that to the amount we are asking for in 1973; yes, sir.

Chairman ELLENDER. Please indicate the difference between the fiscal year request and the amount provided for fiscal year 1972.

Mr. KETTLES. The pay cost for 1972 for a half year is $1,347,000. The increased pay costs for 1973 is $2,781,000, or an increase of $1,434,000 over the comparable costs for 1972.

Chairman ELLENDER. I notice you are asking for the same number of personnel as you had last year; are you not?

Mr. PETTY. We are asking for more money, but we have the same end year strength, Senator. On June 30, 1972, this year, we are authorized to have 3,405 people on board. We are authorized the same number a year from now. However, during this last fiscal year of 1972 we have been coming down. We started the year with a considerably larger number of people, and we have been losing people because of the reduction in strength which has been imposed. So you don't get the full effect. The dollars are not equal within the 2 years.

Chairman ELLENDER. Will the average employment for fiscal year 1973 differ from that for 1972?

Mr. KETTLES. The average amount of employment for 1972 will be some 37 man-years greater than it will be for end fiscal 1973. In other words, our effective manpower will show a decrease in 1973 compared to that available in 1972.

Chairman ELLENDER. So with $1.4 million more in 1973, you will be able to hire enough people to do the work, even though their salaries will increase?

Mr. KETTLES. Yes, sir. The difference here is that we do have about $1.5 million for the full annualization of the pay cost in 1973 as compared with 1972. But our employment levels will remain the same for end fiscal 1972 and end fiscal 1973.

Chairman ELLENDER. Proceed.

Mr. PETTY. It provides necessary funds to support an average of 3,394 man-years of employment as against 3,431 for fiscal year 1972, and 3,539 for fiscal year 1971.

AGENCY PRIMARY RESPONSIBILITIES

The primary responsibility of DCAA is to do all contract audit work required by all elements of the Department of Defense. The Agency provides financial information and advice on proposed or existing contracts and contractors. This audit service is used in the negotiation, administration, and settlement of contract payments or prices which are based on cost or on cost analysis.

REIMBURSABLE SERVICE TO OTHER FEDERAL AGENCIES

The Agency also provides contract audit service to some 21 other Federal agencies on a reimbursable basis in those situations where DCAA maintains audit cognizance because of a contiuing DOD interest, or where it is economical and sensible from a governmentwide point of view.

Chairman ELLENDER. Do you hire extra people to do reimbursable work?

Mr. PETTY. The number of people we do use for the work for other agencies, of course, is included in this total of 3,405. Now, we do receive from the Department of Defense in connection with doing this work for other agencies authorization for two things: We receive authorization for reimbursable obligational authority which is above the direct authority that we are talking about here. We also do receive from them an authorization to have on the rolls a certain number of people to do this reimbursable work.

C–5A CONTRACT

Senator YOUNG. I note you said the Agency provides financial information and advice on proposed or existing contracts and contractors. Do you give advice, for example, on the C–5A type of contract or the F–14 contract?

Mr. PETTY. We deal with any pricing proposal which needs to be considered by the Department of Defense and which is to be evaluated by us and other people. We do audit the costs under the contracts as they are proceeding; yes, sir.

Senator YOUNG. Did you advise the Defense Department to make the C–5A type of contract?

Mr. PETTY. We have nothing to do with the type of contract that is awarded, Senator. Our work is directed toward an evaluation either of proposed costs or costs which have been incurred. We don't have any influence over the type of contract that is awarded.

Chairman ELLENDER. There is no doubt in your mind, though, that the amount of money that was spent for C–5A was authorized and that it was legally proper to spend it?

Mr. PETTY. That is true.

Chairman ELLENDER. Under the contract?

Mr. PETTY. Yes.

Chairman ELLENDER. Proceed.

AGENCIES RECEIVING REIMBURSABLE SERVICES

Mr. PETTY. The principal agencies for which service is provided are: The National Aeronautics and Space Administration; the Department of Health, Education, and Welfare; the Office of Economic Opportunity; the Atomic Energy Commission; the National Science Foundation; the Department of Transportation; and the Department of State. A summary of reimbursable audit work is submitted as exhibit I.

STATUS OF WORK

There have been reduced funding levels for research and development and procurement in recent fiscal years, and this has resulted in fewer pricing proposals to be evaluated and also in a reduction in numbers and value of auditable contracts. Procurement and research and development funds give rise to the major part of the agency's workload. The fiscal year 1973 budget for these appropriations reflects increases in obligational authority, over the fiscal year 1971 level, of approximately $1.8 billion in fiscal year 1972 and $2.5 billion in fiscal year 1973.

Through the use of a rigid system of priorities, by the application of overtime, by transfer and reassignment of personnel, by temporary

duty augmentation of certain field audit offices, and by the use of timesaving techniques, it has been possible to remain in a reasonably current position with respect to the work in hand.

FIELD ORGANIZATION

DCAA auditors have their duty stations in three kinds of field audit offices. Resident offices are maintained in the plants or offices of major contractors, where the continuing volume of work requires full-time attention. There are now 88 of these offices in which the effort of the resident force is substantially concentrated on the claims, representations, and proposals of a single contractor.

Chairman ELLENDER. Can you give us an example?

Mr. PETTY. You mentioned the C–5A. We have resident offices in the Lockheed plants in Georgia and in Burbank. We have these resident offices in Westinghouse at their Baltimore facility, Grumman Aircraft in Bethpage in their aircraft manufacturing facility, at Pratt-Whitney, and so on.

Chairman ELLENDER. Proceed.

RESIDENT OFFICE PERSONNEL AND SUBOFFICES

Mr. PETTY. Usually the staff of a resident office varies from 10 to 30 or more auditors. Suboffices are those which are established in contractor facilities where the services of two to eight or nine auditors are required. There are 209 of these offices at this time.

Chairman ELLENDER. Why were those offices established?

Mr. PETTY. For the same purpose as the resident offices, because there is work to be done in the contractor's plant.

Chairman ELLENDER. It is continuous?

Mr. PETTY. Yes. It requires a smaller number of people, so we use them as suboffices rather than make full-fledged administrative units out of them.

CONSTRUCTION CONTRACT FOR ABM SITE, NORTH DAKOTA

Senator YOUNG. Are you auditing the construction of the ABM site in North Dakota?

Mr. PETTY. We are doing the best we can in that respect.

Senator YOUNG. But you do have people up there.

Mr. PETTY. Yes, we do have people up there.

U.S. AND OVERSEAS BRANCH OFFICES

Contractors having Government volume too small to justify permanent staffs are assigned to 45 branch offices located in major population centers throughout the United States and overseas. Their audit work is done on a mobile or itinerant basis. Liaison offices are established at DOD procurement or contract administration offices, to provide coordination and communication between procurement and contract audit activities. There are presently 26 of these offices, with staffs ranging from one to five auditors.

SELF-SUFFICIENT ORGANIZATION

DCAA is not a completely self-sufficient organization, in that disbursing services, payroll services, and other supporting functions are obtained from other agencies. DCAA reimburses these other agencies for the services they provide. Therefore, substantially all of the operating cost of the Agency is reflected in the budget request which is before you.

WORKLOAD

Workload and performance data are set forth in exhibits II, III, and IV. As of December 31, 1971, we identified 3,454 contractors who had about 41,000 auditable contracts.

Chairman ELLENDER. Who determines whether they are auditable or not?

Mr. PETTY. It is the nature of the contract that determines whether it is auditable.

Chairman ELLENDER. How is that determined?

Mr. PETTY. The decision about what type of contract it will be is made by the procuring office that is going to buy the goods. If they establish a cost-plus-a-fixed-fee contract, it is auditable in that the costs must be audited. If they establish a fixed-price-incentive type of contract, it is auditable in that the final payment in settlement of the contract will be based upon the costs of that contract.

Chairman ELLENDER. Give us an example wherein a contract would not be audited.

Mr. PETTY. All right. If you establish a firm fixed price contract between the Government and the contractor, and the contractor offers to furnish so many glasses for so much per glass and that is what he is going to sell them for and that is what the Government is going to buy them for, without any reference to the cost that he does incur in manufacturing them, then it is not an auditable contract. Where the contract is firm, with a fixed price, it is not auditable. Where it is flexibly priced in any way, it is auditable.

Chairman ELLENDER. Proceed.

Mr. PETTY. We audited $22.9 billion of incurred costs in fiscal year 1971, and have audited $10.2 billion in the first half of fiscal year 1972. We estimate the auditable cost input of the contractors to be about $20.2 billion for fiscal year 1972, and about $21 billion for fiscal year 1973.

In fiscal year 1971, we audited 19,370 contractor price proposals, with a dollar value of $45.5 billion. In the first half of fiscal year 1972, we handled 9,423 proposals, with a dollar value of $22.3 billion. Based on past years' experience, we expect to audit about 20,000 proposals in fiscal year 1972, and 20,500 in fiscal year 1973.

AUDITING PRIORITIES

In order to provide procurement and contract administration with the timely advice it needs to enter into or administer a contract, and at the same time carry out the Agency's assigned responsibilities within its resources, the following priorities have been established:

First, priority is assigned to the preaward evaluation of contractor price proposals.

Second, priority is given to postaward audits under Public Law 87–653, the Truth in Negotiations Act, to a level of effort of 5 percent of direct auditor time.

Miscellaneous audit work which normally takes little time in relation to the total, but must be performed on a timely basis, is given third priority. Examples of this work are: Development of factual material for response to GAO reports, validation of contractor financial status reports, audit of hardship and termination claims, and special request audits.

In the fourth place on the priority ladder is the audit of costs incurred by contractors under both cost reimbursement and incentive type contracts. We continue to find it necessary to defer a certain amount of work in this area.

AGENCY-GAO AUDITING COMPARISON

Senator YOUNG. Do you conduct the same kind of audit on contracts as does the GAO?

Mr. PETTY. No, sir; not generally. You have to qualify the statement. Bear in mind that we are auditing the costs under these contracts at a time when the contracts are being performed, when the work is being done. We are auditing the costs in a considerable amount of detail and rather exhaustive fashion.

Now, GAO characteristically may come along at a later date and make an inquiry about a certain aspect of a contract. But they would not cover, generally speaking, the entire range of costs under a contract as we do.

Senator YOUNG. Do they work entirely independently of you?

Mr. PETTY. Certainly, they work independently of us. We do coordinate our efforts very consciously in order to avoid duplication between us. For example, there was a period of time, you may recall, when they were doing a considerable amount of work in the postaward area under the Truth in Negotiations Act. We also operate in that area.

Now, we very consciously coordinate with them at our regional levels so they know the contracts we are going to audit so they don't come in and duplicate on those particular contracts.

Now, there is not much of any other place where we are in danger of any serious type of duplication, because their responsibility is really quite different from ours.

Chairman ELLENDER. Why would you defer continuing an audit?

Mr. PETTY. Because we don't have enough people to do all of the work that we should and would like to do on an absolutely current basis, and for no other reason.

Chairman ELLENDER. Proceed.

TRUTH IN NEGOTIATIONS ACT (PUBLIC LAW 87–653)

Mr. PETTY. As you know, Public Law 87–653, the Truth in Negotiations Act, requires the postaward review of selected negotiated contracts for more than $100,000 to determine whether the cost of pricing data submitted by contractors were accurate, complete, and current as of the time of the negotiations.

We have instructed the field audit offices to apply to these post-award reviews approximately 5 percent of the available direct auditor time. Manpower resources totaling 135 man-years were utilized for this purpose in fiscal year 1971; it is projected to use 144 man-years in each of fiscal years 1972 and 1973. As of December 31, 1971, DCAA had completed 5,963 reviews for this purpose, with indications of data deficiencies in 991 instances, and with recommended price adjustments of $257.3 million.

SAVINGS RESULTING FROM SETTLEMENTS AND ADJUSTMENTS

The DCAA function is to make the examinations and report findings to the cognizant contracting officers, who then pursue the matter with the contractors. So far, contracting officers have reported to us that they have settled $106.1 million of our recommended price adjustments and have negotiated related price reductions of $33.5 million, resulting in net savings of $21.9 million.

Chairman ELLENDER. Could you be more specific as to where that has happened?

Mr. PETTY. Do you mean companies and names of the contractors?

Chairman ELLENDER. Yes.

Mr. PETTY. I don't have in my mind the names of contractors. I can supply some of that for the record, if you would like to have it. I would prefer to supply it to you as a matter of information and, hopefully, not get it published in the record, if you would accept it on that basis.

DETERMINATION OF ACCURACY OF CONTRACTOR COST DATA DISCLOSURES

Chairman ELLENDER. I was attempting to determine the character of the findings you make.

Mr. PETTY. This Truth in Negotiations Act is directed toward the accuracy, currentness, and completeness of cost data which is provided by contractors before they do receive contract awards.

Our job in this respect then is after the contract award has been made. Even though we may have evaluated the pricing proposal before the award was made, our job is to go in after the fact and, in the light of the records and data which can be made available to us at that time, to determine whether this contractor did disclose to the contracting officer all important facts relating to its proposed cost of which he had knowledge at the time he did enter into this contract.

Now, we find most of the errors in this area in material pricing in one way or another where a contractor may have had available to him a quotation from a vendor, had a lower rate than he actually put into his cost proposal. We find all kinds of things, but many of them have been made in the material area. You come up with all kinds of things.

FINDINGS OF DEFECTIVE COST AND PRICING DATA

We continue to find indications of defective cost or pricing data in about one of every six cases. Nearly one-third of the recommended price adjustments are sustained. We consider this work to be very worthwhile, not only in savings but also in its influence on contractors to exercise greater care in preparation of price proposals.

TRAINING

Training for the Agency's professional auditors is provided "in-house" at the Defense Contract Audit Institute, Memphis, Tenn. The Institute offers eight technical courses designed to provide specialized instruction tailored to the needs of our contract auditors. It is planned that 1,284 students will attend the Institute for fiscal year 1973 for the courses as shown in exhibit VII.

In addition, the Institute manages a special self-study course in statistical sampling for the contract auditors. Approximately 522 auditors will finish this correspondence course during fiscal year 1972 for a total of approximately 1,800 completions.

Chairman ELLENDER. Are these students provided by your Agency?

Mr. PETTY. Nearly all by us.

Chairman ELLENDER. Who pays for their training?

Mr. PETTY. All of the costs of that school and their travel and per diem come out of the budget request which is before you now.

Chairman ELLENDER. What percentage of the students actually are employed by you after completion of the course?

Mr. PETTY. Ninety-nine-plus percent. We have accepted a few students from other agencies on a specific request basis. But nearly all of the students there are our own employees.

Chairman ELLENDER. Is there a condition that they must serve in the Agency after completion of their schooling?

Mr. PETTY. We have some kind of rule that if you do get certain training you have to serve a certain period of time.

Mr. KETTLES. The rule is that they must continue in the Federal Government, not necessarily the Defense Contract Audit Agency.

Chairman ELLENDER. Along the same lines as was their training?

Mr. KETTLES. There is no restriction on that, but generally they would be in the same or a comparable position.

Chairman ELLENDER. Proceed.

EMPHASIS AREAS

Mr. PETTY. As indicated to you in prior appearances, emphasis changes from time to time to accommodate changing circumstances. The Cost Accounting Standards Board (Public Law 91-379) has formulated two standards and a regulation of requirements for submission of disclosure statements on cost accounting system by major contractors.

Cost matters in Navy shipbuilding activities are requiring heavy emphasis; departmental "should cost" studies on major procurements are more numerous; an overhead analysis technique known as Piecost (probability of incurring estimated cost) has moved to the implementation state; and contractor realinements or spin-offs of computer service centers have created some unusual costing problems. These examples require large amounts of audit time, and are mentioned as an indication that we are involved in activities which are constantly undergoing changes in concept or levels of emphasis.

SOUTHEAST ASIA

In line with the planned reduction in U.S. military involvement in Southeast Asia, our Southeast Asia staff has been reduced from a high

of 40 in fiscal year 1969 and 1970 to 28 as of December 31, 1971. As each auditor completes his tour of duty, the need for replacement is carefully evaluated in the light of the existing workload demands. Information pertaining to current staffing and the status of audit for each major contractor in Southeast Asia is set forth in exhibits V and VI.

THEFT

Chairman ELLENDER. We have heard of a great deal of theft that has been going on. Are you cognizant of that?

Mr. PETTY. Of course, in doing our work we do all that we possibly can to prevent thefts through better controls by the contractors when we are auditing property and what not.

We are not, of course, in a position to absolutely prevent theft or misuse of material.

Chairman ELLENDER. I know that. But I wondered if you were cognizant of it, and if you are, to what extent has our Government lost property?

Mr. PETTY. I don't suppose that anybody could really answer your question as to what extent we have suffered losses as a result of bad happenings in that area, Senator.

STEALING OF CONTRACTOR GOODS: MATERIAL PURCHASED BY CONTRACTOR AND MATERIAL FURNISHED TO CONTRACTOR BY UNITED STATES

Chairman ELLENDER. What is the situation if the stolen goods are those of the contractor?

Mr. PETTY. Of course, that is the contractor's loss. It is the contractor's loss if you can establish that it was stolen from him. But you must recognize that much of the material that goes into contract work, which is largely construction work, is bought by the contractor but reimbursed by the Government. I would have to say to you, in all honesty. I think the capability of the Government to recover for stolen or lost material is rather dim.

Chairman ELLENDER. To what extent, if you know, does the Government furnish the material that is used by the contractors in Vietnam? I can well understand if such an arrangement were in the contract, the losses should be the Governments, but if a contract is entered into and materials are stolen from the contractor before he puts them to the use for which they were bought, they should be his loss.

Mr. PETTY. With respect to the contracts we have worked on in this area, they were generally cost reimbursement type of contracts. To my best knowledge, practically all of the material was bought by the contractors and reimbursed by the Government rather than to be bought by the Government and furnished to the contractors. Do I make myself clear?

Chairman ELLENDER. And the loss is that of the Government?

Mr. PETTY. I think we have to say that the loss of material which has disappeared, construction material, material which has disappeared for a reason or reasons unknown, is largely being borne by the Government, sir.

CONTRACT PROVISION HOLDING CONTRACTOR NOT LIABLE FOR LOSSES

Chairman ELLENDER. Do you think that is right? In other words, if I hire you to build a warehouse in Vietnam, you are to provide the lumber or steel necessary to construct it.

Mr. PETTY. Let me answer that in this way and it may aid in your understanding of the situation that does and did exist there.

We had a hard time getting contractors to undertake that construction work. As a result in the huge contracts under which most of the construction work was done, there was a provision that the contractor would not be held liable for such losses. It was a contractual provision. Now, the merits of whether it should or should not have been done that way I don't express any opinion about.

Chairman ELLENDER. Proceed. The Government takes the loss.

SAVINGS

Mr. PETTY. In previous years the committee has been interested in a showing of the net savings resulting from contract audit effort. Exhibit VIII summarizes the savings reported to us by contracting officers for the period July 1, 1967, through December 31, 1971.

Chairman ELLENDER. Will you address yourself to that exhibit and tell us how much you saved?

Mr. PETTY. Bear in mind that this represents only a part of the work that we have done. The data on this sheet relate only to those instances where we have received reports back from contracting officers about settlements. There are many, many situations where we save a lot of money, but we don't receive any such report.

So here we are saying that with respect to the audit of incurred costs we did examine something like $24 billion. We did question in excess of a billion where the amount sustained was $659 million and the net dollar savings out of that were $578 million.

With respect to the evaluation of pricing proposals for $82,654 million, we did question $8 billion plus. Costs questioned sustained were $3.7 billion plus. The net savings were $1.7 billion.

The right column is just a total of the two.

Let me emphasize this represents only a part of our work.

There is much work that we do and many savings that we do accomplish which we cannot document and claim.

Chairman ELLENDER. You are certain your agency saves enough to pay for its operation?

Mr. PETTY. And how.

The amount reported covers only those factual savings set forth in negotiation memoranda received by DCAA. These are specific savings against particular contracts or price proposals. It does not cover all savings on all audit activity because we have factual data only on that which is finally reported back to us.

Mr. Chairman, this concludes my prepared statement. I will be pleased to try to answer any questions which you may have.

EXHIBITS ACCOMPANYING STATEMENT

Chairman ELLENDER. At this point in the record there will be included the exhibits which accompanied your statement, Mr. Petty.

(The exhibits follow:)

EXHIBIT I

DEFENSE CONTRACT AUDIT AGENCY

SUMMARY OF REIMBURSABLE AUDIT WORK FOR NON-DOD AGENCIES
(Dollars in Thousands)

	FISCAL YEAR 1971		FISCAL YEAR 1972		FISCAL YEAR 1973	
	Reimb. Earned	Man-Years Expended	Est. Reimb. Earnings	Man-Years Required	Est. Reimb. Earnings	Man-Years Required
NASA	$4,883	309	$5,238	295	$5,342	295
AEC	289	18	300	17	306	17
DOT	467	30	550	31	561	31
DHEW	732	46	513	29	523	29
Peace Corps	29	2	30	2	31	2
State (AID)	136	9	138	8	140	8
OEO	126	8	113	6	115	6
NSF	93	6	135	8	138	8
Interior	128	8	122	7	125	7
Commerce	70	5	55	3	56	3
Labor	99	6	117	6	119	6
Post Office	76	5	102	6	103	6
EPA	13	1	54	3	56	3
Other	102	6	136	8	139	8
TOTAL	$7,243	459	$7,603	429	$7,754	429

NOTE: Increased earnings in the reimbursement program result from Congressional pay raises under PL 91-656 and PL 92-210.

EXHIBIT II

COMPARATIVE WORKLOAD INDICATORS

	First Half FY 1972	FY 1971
Number of Contractors - End of Period	3,454	3,685
New Auditable Contracts	5,805	10,531
Dollar Value (Billions)	$10.3	$26.7
Costs Audited (Billions)	$10.2	$22.9
Contracts in Inventory - End of Period	41,302	43,008
Price Proposals Completed	9,423	19,370
Dollar Total (Billions)	$22.3	$45.5

STATUS AS OF DECEMBER 31, 1971

Estimating System Surveys	
Number of Contractor Locations	243
Reports Issued	241
Audit of Direct Costs	
Number of Major Contractors	261
Audited through Sept. 1971 or later	16
Audited through Dec. 1970	197
Audited through Dec. 1969	39
Audited through Periods Prior to Dec. 1969	9
Overhead Audit Reports	
Number of Major Contractors	233
Audited through 1971 Fiscal Years	12
Audited through 1970 Fiscal Years	158
Audited through 1969 Fiscal Years	50
Audited through 1968 Fiscal Years	7
Audited through 1967 Fiscal Years	6

EXHIBIT III

COMPARATIVE AUDIT PERFORMANCE DATA
($ in billions)

Dollars Examined	FY 1971	First Half FY 1972	Estimated Input FY 1972	Estimated Input FY 1973
Incurred Costs	$ 22.9	$ 10.2	$ 20.2	$ 21.0
Pricing Proposals	46.1	23.0	45.0	46.0
Total	$ 69.0	$ 33.2	$ 65.2	$ 67.0
Costs Questioned				
Incurred Costs	$ .6	$ .3	-	-
Pricing Proposals	3.1	1.4		
Total	$ 3.7	$ 1.7		
Number of Pricing Proposals	19,370	9,423	20,000	20,500

EXHIBIT IV

NUMBER OF CONTRACTS AND PRICE PROPOSALS

	Contracts			Proposals		
	Defense	Non-Defense	Total	Defense	Non-Defense	Total
On Hand, 7/1/71	31,151	10,633	41,784	1,278	146	1,424
Received	4,304	1,501	5,805	8,387	1,237	9,624
	35,455	12,134	47,589	9,665	1,383	11,048
Completed	4,843	1,444	6,287	8,197	1,226	9,423
On Hand, 12/31/71	30,612	10,690	41,302	1,468	157	1,625

EXHIBIT V

STAFFING IN SOUTHEAST ASIA

	Staffing at 12/31/70	12/31/71
Auditor		
Vietnam		
Saigon Branch Contractors: RMK-BRJ Philco-Ford Federal Electric	16	12
Pacific Architects & Engineers Suboffice	6	10
Cam Rahn Bay Suboffice	2	0
Thailand		
Bangkok Suboffice	3	2
Clerical		
Vietnam	3	3
Thailand	2	1
TOTAL STAFF	32	28

NOTE: Includes 5 foreign nationals at 12/31/70 and 3 at 12/31/71

EXHIBIT VI

MAJOR CONTRACTORS IN SOUTHEAST ASIA

STATISTICS AS OF DECEMBER 31, 1971

	RMK-BRJ (000)	PA&E (000)	FEDERAL ELECTRIC (000)	PHILCO-FORD (000)
Contract Obligations	$1,861,990	$537,478	$16,478	$292,781
Costs Claimed	1,721,788	480,463	11,720	254,248
Costs Audited	1,687,803	470,834	9,362	169,362
Disallowances	2,243	2,285	-0-	136
Suspensions	275	3	-0-	-0-
Other Savings	1,339	3,524	-0-	1,774

EXHIBIT VII

DEFENSE CONTRACT AUDIT INSTITUTE COURSES - FY 1973

Course	No. of Courses	No. of Students	No. of Days	Student Days
Technical Indoctrination (for all new auditors)	4	120	10	1,200
Advanced Contract Auditing	6	180	5	900
Audits of Terminated Contracts	2	60	5	300
Instructor Training Workshop	1	24	5	120
Graphic, Computational & Improvement Curve Analysis Techniques	8	240	8	1,920
Statistical Sampling Seminar	8	240	5	1,200
Auditing in an ADP Environment	7	210	8	1,680
Supervision & Technical Management of Audits	7	210	5	1,050
	43	1,284		8,370

EXHIBIT VIII

SUMMARY OF NET SAVINGS REPORTED
(July 1967 through December 31, 1971)

(Compiled from Copies of
Negotiation Memoranda Received by DCAA)

(Dollars in Millions)

	Audit of Incurred Costs	Evaluation of Price Proposals	Total
Dollars Examined	$24,067.2	$82,654.0	$106,721.2
Costs Questioned	1,051.6	8,128.9	9,180.5
Costs Questioned Sustained	659.8	3,742.1	4,401.9
Net Savings	578.2	1,731.4	2,309.6

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AGENCY-GAO AUDITING COMPARISON

Chairman ELLENDER. I think Senator Young has asked you the difference between what you do and what the General Accounting Office does. Have you anything to add to that?

Mr. PETTY. No, sir; I don't believe so. Please remember that we are on the firing line, so to speak, doing the work, when the operations are taking place, and GAO has a different responsibility, to come along generally at a later date.

GAO INSPECTION AND CRITICISM OF AGENCY AUDIT

Senator YOUNG. My real question is: Does GAO question your audits at any time?

Mr. PETTY. They take a look at the way we do things every once in a while, and they have looked at a number of our activities during the past several years. They are, at the present time, reviewing our activities in the Truth in Negotiations audit area.

Senator YOUNG. Do they ever criticize you?

Mr. PETTY. They don't hesitate to criticize us when they see fit to do so.

Chairman ELLENDER. Have they?

Mr. PETTY. Yes; they have criticized us.

Chairman ELLENDER. What did you do about it?

Mr. PETTY. What we try to do is to correct whatever we are doing wrong so we don't have that deficiency again. But with 3,500 people working in about 300 different places, we are going to make some mistakes and anybody that looks is going to find some mistakes. We are not that perfect.

Chairman ELLENDER. Well, I am glad that you admit it. Are there any further questions?

Senator YOUNG. No, Mr. Chairman.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that questions submitted by him be answered for the record. The questions and the responses will appear at this point.

(The questions and answers follow:)

DEFENSE SHARE OF DCAA WORK

Senator THURMOND. Mr. Petty, what percent of DCAA's work is spent strictly on Department of Defense contracts?

Mr. PETTY. Approximately 87%.

Senator THURMOND. Is there any order of priority considered between DoD and the other federal agencies when situations arise where more demands are made than your agency can meet?

Mr. PETTY. DoD work takes precedence in case of conflict in scheduling work. We have, however, had very little difficulty with respect to such conflicts.

DCAA Savings

Senator Thurmond. Mr. Petty, could you cite some examples of how money has been saved as a result of the DCAA auditing work?

Mr. Petty. Savings are chiefly accomplished when DCAA auditors audit costs incurred and disallow costs which are unallowable, not allocable or not reasonable under the ASPR cost principles or the terms of contracts; evaluate contractor pricing proposals and question the necessity or reasonableness of amounts proposed for labor, materials, purchased parts, special facilities and tooling, and overhead; arrange for the adjustment of contract prices as a result of post award audits to determine the accuracy, currentness and completeness of cost or pricing data submitted by contractors as the basis for negotiation; audit termination, delay and disruption, hardship and other claims, and question the propriety of the amounts claimed.

Justification of Resident Offices

Senator Thurmond. How large a contract would a company have to justify a resident office of DCAA auditors?

Mr. Petty. I cannot answer your question in terms of a single contract. The determination that a resident office is needed is based on the existence, in a contractor facility, of a great enough volume of contracts and a sufficient number of pricing proposals to justify the continuous presence of auditors in the facility, rather than to have the work done on a mobile basis.

Large Audits and Assignments

Senator Thurmond. What are some of the largest contracts being audited by your agency and how many men are assigned to each of these contracts?

Mr. Petty. Some of the largest contracts are those for the aircraft carriers being built by Newport News, the DD963 ships by Litton Industries, the F–14 aircraft by Grumman, the F–15 aircraft by McDonnell-Douglas. Our auditors are not assigned to specific contracts, but the personnel on duty in the Resident Offices which have cognizance of the above are as follows: Newport News 17; Litton-Pascagoula 16; Grumman 32; McDonnell-Douglas-St. Louis 24.

Relationship With GAO

Senator Thurmond. Mr. Petty, when the General Accounting Office is making a report on a specific contract, do they sometimes perform their own auditing or is this always done by your agency?

Mr. Petty. GAO performs its own audit work, but they do make reference to our audit reports and working papers where we have previously audited the contracts or subjects with which they are concerned.

Mark-48 Torpedo Claim

Senator Thurmond. What specific role does DCAA play in contractor claims such as the Westinghouse claim against the Mark-48 torpedo program?

Mr. Petty. Upon request we will audit or evaluate the amounts proposed by the contractors in such claims.

"Should Cost" Studies

Senator Thurmond. Mr. Petty, some people have criticized "should cost" studies. What is your opinion of such studies?

Mr. Petty. I can't give a generalized answer to your question. Some of the should cost studies have, in my view, been very useful and valuable, others less so. I would say that they have more going for them than against them.

Senator THURMOND. Can you cite any examples where "should cost" studies have resulted in significant monetary savings for the government?

Mr. PETTY. Significant savings have been claimed for aircraft engines from Pratt and Whitney, the Improved Hawk Missile from Raytheon, the UH1H helicopters from Bell Helicopter Co., and the SRAM (Missile) from The Boeing Company.

POSSIBLE DUPLICATION OF ACTIVITIES

Senator THURMOND. What other agencies sometimes duplicate the work on DCAA on various contracts?

Mr. PETTY. To my best knowledge no other agencies should be duplicating the work of DCAA, except to the extent that GAO may sometimes cover the same subjects.

SAVINGS REALIZED

Senator THURMOND. Mr. Petty, on Exhibit VI of your statement you show savings resulting from audit work on three contracts. Would you describe the nature of these savings?

Mr. PETTY. The savings resulted from disallowance of such claimed costs as: General and Administrative expenses improperly allocated to the contracts; excessive fee paid to a major subcontractor; other improper payments to subcontractors; costs unallowable under ASPR cost principles; cost incident to currency fluctuations; air fares improperly claimed for terminated employees; improper salary and wage payments; amounts claimed but not in fact incurred or paid.

SUBCOMMITTEE RECESS

Chairman ELLENDER. The subcommittee stands in recess until 10 o'clock tomorrow morning.

(Whereupon, at 12:35 p.m., Wednesday, March 22, the subcommittee was recessed, to reconvene at 10 a.m., Thursday, March 23.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

THURSDAY, MARCH 23, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

DEPARTMENT OF DEFENSE

DEFENSE NUCLEAR AGENCY

STATEMENT OF LT. GEN. CARROLL H. DUNN, U.S. ARMY, DIRECTOR

ACCOMPANIED BY:

DR. JOHN A. NORTHROP, DEPUTY DIRECTOR, SCIENCE AND TECHNOLOGY
JAMES J. LEONARD, COMPTROLLER
PETER HAAS, SCIENTIFIC ASSISTANT TO THE DEPUTY DIRECTOR, SCIENCE AND TECHNOLOGY
WILLIAM M. PLOUGH, BUDGET OFFICER

BUDGET REQUESTS

Chairman ELLENDER. The subcommittee will come to order.

The next item for consideration is the request of the Defense Nuclear Agency. This is contained in a number of appropriations and totals $156,320,000. These are as follows:

Operation and Maintenance, Defense Agencies, $13,970,000.
Procurement, Defense Agencies, $446,000.
Research, Development, Test and Evaluation, $128,741,000.
Military Personnel, $10,567,000.
Military Construction, $2,596,000.

Of these, the first three are specific requests of the Defense Nuclear Agency in Defense Agencies appropriation requests. The Military Personnel request is found in that of the Services. The Military Construction request will be considered in another bill.

AGENCY NAME AND RESPONSIBILITY CHANGES

The principal witness is Lt. Gen. Carroll H. Dunn, Director, Defense Nuclear Agency.

You may proceed.

General DUNN. Mr. Chairman, I appreciate the opportunity to present the program and budget for fiscal year 1973 for the Defense Nuclear Agency.

I have with me several members of my staff, including Dr. John Northrop, Deputy Director of Science and Technology.

During the 25 years of the Agency's existence, our name and mission have changed to keep pace with national requirements and advances in weapon technology. As you know, the most recent change, both in name and responsibilities, was the result of recent decisions by the Secretary of Defense.

RETAINED, TRANSFERRED, NEW AND EXPANDED FUNCTIONS

Certain functions have been retatined by the agency, others were transferred to the Services, and some new or expanded functions were assigned to DNA.

ALBUQUERQUE COMPLEX OF KIRTLAND, SANDIA AND MANZANO BASES

The Albuquerque complex consisting of Kirtland Air Force Base, Sandia Base and Manzano Base has been consolidated, for support purposes, under the Air Force. The military departments have assumed full responsibility for their individual nuclear technical training and the Air Force has been designated to act as the DOD Executive Agent to teach all general interest courses and to designate which of these present general interest courses will be continued. Activities relative to development of new weapons have been assigned to the Services, such as: conducting Phase I studies, chairman of Phase II studies, lead project officer and DOD membership of project officer groups and design review and acceptance groups and the proposing of military characteristics to the Military Liaison Committee.

Chairman ELLENDER. Has that always been the case?

General DUNN. We have handled that up until the first of July last year and that has gradually now been passed to services as they developed capability to operate this directly with AEC and we fit in a position of monitor and helpful assistance where assistance can be made available.

Chairman ELLENDER. To what extent has that change affected the budget?

General DUNN. Very little, sir, because there was not very much money involved in this. This was a matter of a few military people operating in this field.

Chairman ELLENDER. How many?

General DUNN. Probably about 10, sir. We are using these people in a different area at this time.

Chairman ELLENDER. Will it be more specific?

General DUNN. It is still in the study area.

MILITARY PERSONNEL AND RANKS

Chairman ELLENDER. I tell you why I asked that. I am trying to find out where the administrative people work, if I can, to see if it is possible to utilize more civilians so as to save the military personnel for combat-related activities.

General DUNN. Right.

Chairman ELLENDER. Some of this work is done in conjunction with the AEC?

General DUNN. That is correct.

Chairman ELLENDER. I wish you would be specific and indicate to the committee how you propose to use the funds requested and how many military personnel, together with their grades, you will employ.

General DUNN. I cannot give you the grades today. We can furnish it. I can tell you the numbers.

Chairman ELLENDER. Supply it for the record.

(The information follows:)

FISCAL YEAR 1973 MILITARY PERSONNEL BY GRADES

Grade:	Budget	Grade:	Budget
09	1	E9	4
08	2	E8	14
06	30	E7	51
05	111	E6	90
04	145	E5	109
03	69	E4	56
02	2		
W4	16	Total Enlisted	324
W3	1		
		Grand total	701
Total Officers	377		

TOTAL MILITARY AND CIVILIAN PERSONNEL

General DUNN. I can give you the numbers in the categories. Would you like me to address it at this time?

Chairman ELLENDER. Would you summarize it?

General DUNN. Actually, the total number of military, sir, in all programs is 701.

Chairman ELLENDER. What are the programs you refer to?

General DUNN. O. & M., Research and Development, Procurement, everything that we have, our total number of military is 701 and our total number of civilians is 711. In other words, the total strength is 1,412. They are almost exactly half military and half civilian.

Chairman ELLENDER. This is how the $156 million will be utilized?

General DUNN. Yes, sir.

PAY OF MILITARY PERSONNEL

Chairman ELLENDER. That includes funds for the military personnel as well?

General DUNN. They are included in the approximately $10.6 million of military personnel funds, which is not a part of this particular appropriation, but counted in your $156 million, sir.

Chairman ELLENDER. Although they are paid by the military services?

General DUNN. Yes, that is right.

Chairman ELLENDER. Do you not do it on a reimbursable basis?

General DUNN. Their own services pay each individual person. I, as Army, am paid by the Army, and Air Force people are paid by the Air Force, and so on.

Chairman ELLENDER. You are paid directly by the Department of the Army?

General DUNN. That is correct, sir. I am paid by the Army Finance Officer, though, in Washington.

Chairman ELLENDER. As you say, $10 million, approximately, is required for that purpose?

General DUNN. I believe the correct figure is $10,567,000.

PAY OF CIVILIAN PERSONNEL

Chairman ELLENDER. Civilian personnel costs are included in your overall figures.

General DUNN. They are paid in this money that is available to us. Most of them out of either the Operations and Maintenance part or out of the Research and Development portion of our program.

RESEARCH, DEVELOPMENT, TEST AND EVALUATION: COORDINATION WITH AEC

Chairman ELLENDER. The Research, Development, Test and Evaluation request amounts to $128 million, approximately.

General DUNN. Yes.

Chairman ELLENDER. Will any of that sum be spent under the jurisdiction of the AEC?

General DUNN. No, sir, it is spent under my jurisdiction. This does not include AEC's responsibilities.

Chairman ELLENDER. I see.

General DUNN. I will cover that, sir, later in my testimony.

Chairman ELLENDER. To what extent do you coordinate your efforts with AEC?

General DUNN. Very, very closely, sir. We are the DOD agent that deals with AEC directly, where they have a total responsibility for the development and production of an atomic weapon. We are then the agency for DOD who then takes administrative custody of that weapon, and, that is, after it is finished, the physical custody, handling it is the responsibility of each service, but on a joint basis for DOD we pick up custody of that.

We have other responsibilities I will cover in more detail in my statement on research and development which deals with what we call weapons effects, the effects of an atomic weapon, which is a DOD responsibility as opposed to AEC responsibility of designing and building the weapon.

DETERMINATION OF REQUIREMENT FOR NUCLEAR WEAPONS

Chairman ELLENDER. How is your coordination with the AEC accomplished so as to provide for new requirements?

General DUNN. We, in the Defense Nuclear Agency, for the Secretary of Defense and Joint Chiefs of Staff, put together a paper every year which says what the nuclear weapons requirements of the Department of Defense are.

Now, we get information from all of the services, the overseas commanders, put together a draft paper which is then reviewed by the Joint Chiefs of Staff and then reviewed by the Secretary of Defense and the Military Liaison Committee established by law at the time of the Atomic Energy Commission. That goes from the Secretary of Defense to AEC for their review of requirements.

Chairman ELLENDER. That is finalized from information that you get?

General DUNN. That we get, yes.

Chairman ELLENDER. From all of the services?

General DUNN. Yes, sir.

Chairman ELLENDER. Who is the final authority as to what should go to AEC?

General DUNN. The Secretary of Defense makes the final approval.

Chairman ELLENDER. He bases his decision on your recommendations?

General DUNN. Actually, what he bases it on is what is the approved version of the Joint Chiefs of Staff.

STRICT DEFINING OF RESPONSIBILITIES

Chairman ELLENDER. I am trying to find out why it is that we have so many layers of Defense personnel to go through to reach a decision. This particular example relates to your agency and the AEC.

General DUNN. Yes.

Chairman ELLENDER. It strikes me that there is a lot of lost motion somewhere. What I want you to do in replying to these questions is to be specific as to exactly what your functions are.

General DUNN. Right.

Chairman ELLENDER. The agency's decisions are purely advisory, because the decisions are made by the Secretary of Defense and the Joint Chiefs of Staff.

General DUNN. Yes; they are.

SOURCES OF FACTUAL DATE: ASSISTANT SECRETARY FOR ATOMIC ENERGY MATTER, CHAIRMAN OF MILITARY LIAISON COMMITTEE

Chairman ELLENDER. Does the Secretary of Defense as well as the Joint Chiefs of Staff depend entirely on your submission of the factual data from other agencies in the Defense Department?

General DUNN. No, sir. The Joint Chiefs of Staff, of course, do make staff review.

Chairman ELLENDER. Is the staff review yours?

General DUNN. No, in addition, in the Joint Chief of Staff, the Secretary of Defense has an assistant for atomic energy matters, who by law is chairman of what is called Military Liaison Committee, and this is a group set up at the time AEC was formed.

Chairman ELLENDER. Do you know how many personnel are in that group?

General DUNN. It is made up of two representatives from each of the services, plus the chairman who is in the office of Mr. Laird.

COMMITTEE INSTRUCTIONS FOR AGENCY STUDIES AND AGENCY REPORTS TO COMMITTEE

Chairman ELLENDER. Describe the operation of that group.

General DUNN. They act on, or I receive instructions from time to time from that group as to areas of study or areas of particular matters of concern in nuclear affairs that they request that we study and determine. I report to that group our plan of tests and research and development.

Chairman ELLENDER. That is the overall study you make?

General DUNN. Yes.

Chairman ELLENDER. What do they do with that?

General DUNN. They act on it in making recommendations to the Secretary of Defense.

Chairman ELLENDER. Why could not your recommendations be made directly to the Secretary of Defense instead of having them pass through other layers of Government?

AGENCY COLLECTION AND ANALYSIS OF INFORMATION AND TRANSMITTAL TO JOINT CHIEFS OF STAFF

Let's start with what you do. How you get your information, and what do you and the others do with it before it reaches the point of production?

General DUNN. We go either by personal visit or by letter to the commanders, what we call the joint commanders, and that includes, for instance, U.S. Command, Europe; U.S. Command, Pacific; Strategic Air Command, and we get from them what they consider to be their needs. We then put this information together in a paper together with such additional information we may have from our own sources or from discussion with individual services and make up a draft paper, which then I send direct to the Joint Chiefs of Staff.

Chairman ELLENDER. Does your organization analyze the information?

General DUNN. We make an analysis of it as well as gather it.

Chairman ELLENDER. And then that is presented to whom by you?

General DUNN. To the Joint Chiefs of Staff.

REVIEW BY JOINT CHIEFS OF STAFF AND REPORT TO SECRETARY OF DEFENSE

Chairman ELLENDER. Do the Joint Chiefs of Staff look at it directly or do they have a staff to whom your reports are made available?

General DUNN. They have a few people who, before they finally act on it, look at this from a point of view of overall military requirements and allocation as between the various commands.

Chairman ELLENDER. When you say "overall requirements," are you referring to the AEC?

General DUNN. I am talking about total military requirements, and the part that nuclear weapons play in our overall military strategy.

Chairman ELLENDER. I thought you were in charge of the Nuclear Agency.

General DUNN. I am, but they also look at the question of whether, for instance, a missile is going to be both nuclear and nonnuclear, so that they look at this from the total military requirements viewpoint as to how the nuclear requirements fit into it. Then they take final action on this paper, and it goes to the Secretary of Defense.

Chairman ELLENDER. You deal solely with nuclear weapons?

General DUNN. Totally with nuclear, that is correct.

Chairman ELLENDER. I inferred that your function was broader. That is why I asked the question again.

General DUNN. I didn't make that clear. The Joint Chiefs of Staff, in their review, look at the requirements broadly.

Budget Percentage Devoted to Manpower

Chairman Ellender. The purpose of my questioning, as I have said, is to determine the numbers of layers of authority a recommendation must go through before it becomes an action. Over 50 percent of this budget goes into the pay and benefits to personnel. In order to economize or provide more hardware, this must be borne in mind.

Before you proceed, I will insert Chart I in the record.

(The information follows:)

Chart No. 1

DNA Mission and Responsibilities

MISSION

To support the Secretary of Defense, the Joint Chiefs of Staff, and other components of the Department of Defense as appropriate, in all matters concerning nuclear weapons.

RESPONSIBILITIES

To provide consolidated management of the DOD nuclear weapons stockpile.

To provide management of DOD nuclear weapons testing and nuclear weapons effects research programs.

To furnish staff advice and assistance on nuclear weapons matters to the Secretary of Defense, the Joint Chiefs of Staff, the services, and other DOD components and Government agencies as appropriate.

AGENCY MISSION AND RESPONSIBILITIES UNDER NEW CHARTER

General Dunn. Chart 1 depicts the current Defense Nuclear Agency mission and responsibilities as defined in our new charter.

Consolidated management of the entire nuclear weapons stockpile involves overall inventory management and direction, as opposed to physical custody of the weapons.

Managmentof DOD nuclear weapons testing and nuclear weapon effiects research programs is our largest responsibility in terms of budget dollars. These programs are funded as an R.D.T. & E. activity.

Our third major responsibility, that of providing staff advice and assistance on nuclear matters, does not loom large in the budget. It has, however, substantial importance to national military capabilities.

Chairman Ellender. There is an assistant to the Secretary of Defense who deals with atomic energy.

General Dunn. Yes, for those things that have to do with relationship with the AEC; yes, sir.

Weapons Tests and Weapons Effects Tests

Chairman Ellender. Isn't that his entire responsibility?

General Dunn. Yes, but I report, for instance, to Dr. Foster, Director of Defense Research and Engineering, on all research and weapons effects programs.

Chairman Ellender. When you report to Dr. Foster, is it to recommend the kind of weapons you think you need?

General Dunn. He approves my budget and test program for weapons tests and weapons effects tests, which is, as you note, the major portion of the budget, about $128 million.

Chairman ELLENDER. Yes. This testing is carried on by whom?

General DUNN. We are responsible for it, sir. Defense Nuclear Agency.

CONTRACTORS

Chairman ELLENDER. Are there additional personnel involved other than the ones you mentioned?

General DUNN. Those that we make contracts with to provide material needed for the tests or, for instance, people who work for the Atomic Energy Commission at the nuclear test site in Nevada, we use their resources there. In other words, we provide money and use their contractors already there, so there is centralized control of eveybody working in the Nevada test site, for instance. That is part of our close liaison with AEC and its laboratories.

Senator YOUNG. Mr. Chairman?

Chairman ELLENDER. Yes.

RESPONSIBILITIES OF THE PRESIDENT

Senator YOUNG. Doesn't the White House play a most important role in determining what nuclear capability the armed services are supposed to develop?

General DUNN. Yes, sir. In the nuclear field specifically, the President personally approves the allocation of weapons every year and does do that.

Senator YOUNG. It has been an expensive operation, because, previous to the war in Vietnam, we were fearful of a nuclear war and building against it, and doing little in preparation for a possible conventional war. We are now going in the opposite direction, building a capability for a conventional war. The recommendations of the Joint Chiefs of Staff should play an important role in any determination that the President makes, but it is quite a long chain of command that you are subjected to.

General DUNN. That is correct, sir. Of course, the President, though, has final responsibility in everything dealing with nuclear weapons as in other things, of course. But specifically he does sign a paper every year that allocates the weapons resources and also indicates on a 5-year basis the plan for the future, subject to final approval every year.

Senator YOUNG. I agree with the Chairman. It has become more a war of dollars than men. If we spend too much on personnel, there won't be enough dollars left, then, to have a modern type of military force we should have.

General DUNN. Yes, sir.

Senator YOUNG. You have brought up another matter. When the President actually gets these recommendations, what does he do?

General DUNN. Well, that goes to him.

Chairman ELLENDER. Through the Secretary of Defense?

General DUNN. Yes, every year.

ADVISERS TO THE PRESIDENT

Chairman ELLENDER. I understand, Senator Young, the President has quite a few advisers under him for such purposes.

Senator YOUNG. Yes; and he is building up his staff.

Chairman ELLENDER. Yes; he has a staff there.

Chairman ELLENDER. It strikes me that much of this review could lead to confusion and duplication.

General DUNN. Yes.

Chairman ELLENDER. In passing, I might say that it is frequently frustrating for a Senator, when he asks a simple question of the Defense Department, to find that he must shuttle through several layers of personnel before he can find the answer. In a similar vein, I believe that if you are charged with the responsibility of conducting an agency, you should make your recommendations directly to the Secretary of Defense and through him to the President.

OTHER FUNCTIONS AND RESPONSIBILITIES EXPANDED BY NEW CHARTER

General DUNN. I am moving to the second paragraph on page 3 now. There are other functions falling within our responsibility of providing staff assistance and advice on nuclear weapons which have been expanded by the new charter. We now perform technical analyses and studies for the Secretary of Defense, the military departments and the Joint Chiefs of Staff of nuclear-related problems and assist in keeping them advised on state-of-the-art developments. DNA exercises greater responsibilities, within the guidelines established by the Joint Chiefs of Staff, for recommending DOD-wide safety and security standards and operating procedures for nuclear weapons. We continue to conduct nuclear weapons technical standardization inspections under the guidelines and frequencies established by the Joint Chiefs of Staff. Further, presently under study by JCS/DNA is the feasibility of initiating a program of increased DNA responsibility for field review of nuclear inspections now being conducted by the services and operational commanders.

WEAPONS TESTING AND WEAPONS EFFECTS RESEARCH

I would like to point out some of the significant points regarding our responsibility in the DOD nuclear weapons testing and nuclear weapon effects research efforts.

The R.D.T. & E. program is aimed at nuclear weapon effects generally, but more specifically at those effects which may limit the ability of military systems to operate properly. We are all aware of those major efforts required to advance the technologies required to provide significant improvements in military hardware. Such items as survivable communications, command and control, more accurate missiles, antisubmarine warfare techniques, and higher performance aircraft are constantly before us. We are acutely aware of progress made toward better performance and hence greater military effectiveness. Such performance is frequently judged in either a peaceful environment, or at most in the hostile environment of conventional warfare. Yet, the most critical strategic military systems would be useless unless they were capable of performing their task in the hostile environment of a nuclear exchange. And in many cases this nuclear environment presents serious problems in design of weapons systems.

AEC MANUFACTURE AND TEST OF NUCLEAR COMPONENTS

Chairman ELLENDER. To what extent, to your knowledge, does AEC test these weapons after they are turned over to them for production?

General DUNN. The AEC produces the weapons and before they go into production they make a proof test of their design. Once it is completed to their satisfaction that is the nuclear portion of the weapon, not the total weapons systems but the nuclear system, meets requirements of the military system given to them they begin production.

Chairman ELLENDER. How can they test without the other parts of the system?

General DUNN. Well, they can test, in other words the tests of a nuclear component, say of a bomb, includes what we call the fire set, the thing that sends the signal. On the other hand, the test of a warhead for, let us say, a Minuteman missile, you could test the nuclear component without having the total reentry vehicle, the guidance system, that part of it which is the responsibility of DOD. In other words, the AEC does the nuclear components and those things required to make the nuclear components work. They do not do the reentry vehicle form itself, the guidance, and the nonnuclear portion.

Now, they have total repsonsibility for that manufacturing and test. They make a proof test before they go into manufacture.

Once they go into the manufacture of this, then enough are made so that over the years, as that weapon is in the stockpile, a certain number can be taken out but they are not exploded. Nondestructive tests are made on those.

AEC, with DOD cooperation, continues to make those detailed studies.

AGENCY TESTING

Now, our part of this, which I am about to explain in our R.D.T. & E. budget, is to do the testing of those things that are nonnuclear, which are the responsibility of the DOD.

Chairman ELLENDER. You have those parts to test?

General DUNN. We have the tie-in and do this with the services. Any tests of a nuclear weapon for the DOD, we are responsible for.

TESTING OF NUCLEAR-CARRYING VEHICLES

Chairman ELLENDER. As to the vehicle that will carry these bombs, to what extent is the construction of that supervised by the AEC?

General DUNN. Only insofar as they are aware of how the weapon is to be used and they, with the services and with us, review such things as safety and how this can be used, the environment in which the weapon can live and can function. So there has to be a joint meeting there, since they have a responsibility for design and production, and the Services have a responsibility for design and production and use of the weapons system.

Chairman ELLENDER. That is the carrier?

General DUNN. The carrier, yes, sir; the guidance system, reentry vehicle, whatever the case may be.

Chairman ELLENDER. Continue.

HARDENING AGAINST NUCLEAR WEAPONS EFFECTS

General DUNN. Our task, then, is to learn how nuclear explosions could prevent our systems from working properly and aid in designing them so as to avoid these problems, a process called hardening. This is accomplished in five steps, as shown in chart No. 2.

(Chart 2 follows:)

CHART NO. 2

HARDENING AGAINST NUCLEAR WEAPONS EFFECTS

Measurement of weapon radiation effects.
How weapon radiations damage military systems.
Development of techniques for hardening against effects.
Application of hardening techniques to military systems.
Testing of systems to confirm successful hardening.

DETERMINATION OF NUCLEAR RADIATION RESULTING FROM WEAPON EXPLOSION

General DUNN. Our first task is that of establishing in detail the outputs of nuclear weapon explosions that are potentially damaging. This work starts right where the AEC job ends. The AEC has the complete responsibility of designing and testing all nuclear weapons. They study the nuclear physics, design and make the bomb hardware, and test that it explodes. We then take over to define how the nuclear radiation from such a weapon produces those indirect secondary effects that also cause damage.

Chairman ELLENDER. How do you test radiation?

General DUNN. In underground tests. Also we are trying to develop simulators, and we have made progress, I will outline here, but this is a field we are pushing as fast as we can.

Chairman ELLENDER. What you test underground is a product of AEC?

General DUNN. That is correct, the actual item exploded is handled and made by AEC and exploded by them.

ASCERTAINMENT AND DEVELOPMENT OF TECHNIQUES TO PREVENT SECONDARY-EFFECTS DAMAGE TO HARDWARE

Next, we study the ways these secondary effects actually damage hardware and develop techniques to prevent such damage. The next task, that of applying what we have learned to the design of actual system hardware, is primarily the responsibility of that service developing the weapon system. In other words, we develop a central coordinating element to put together the information found on these weapons effects and provide it to each individual service.

For instance, if it is a warhead off of a POLARIS missile, it has the same reentry problems as a warhead of a MINUTEMAN, so there is a consolidation of effort here in a joint agency as opposed to each service setting up its own. We then give advice as to how the job shall be done either by providing actual nuclear explosions to test them or designing devices that can simulate nuclear effects.

CHART NO. 3

NUCLEAR WEAPON EFFECTS

Classical Effects

Blast.
Thermal radiation (heat, light).
Nuclear radiation (gamma rays, X-rays, neutrons).

Modern Effects

X-rays damage to missiles.
Radiation on electronics (X-rays, gamma rays, neutrons).
Electromagnetic pulse (radioflash).
Blackout (radar and communications).
Dust.
Ground shock.

EFFECT OF NUCLEAR WEAPON BURST NEAR EARTH SURFACE

General DUNN. You are all aware of the classic effects of a nuclear weapon burst near the ground: blast, heat, and nuclear radiation. Modern weapon systems can be damaged by other effects that are not as obvious but can be even more serious. We have discussed all of these with you in previous years. However, new information is constantly becoming available through our research program, and applications to new hardware development programs continue.

NUCLEAR RADIATION X-RAYS: SIMULATION MACHINE DEVELOPMENT

The primary bomb output is in nuclear radiation X-rays, which can be damaging to missiles and satellites. The evaluation testing of MINUTEMAN and POSEIDON to survive this radiation was essentially completed several years ago by means of underground nuclear tests. [Deleted.] We have been working on simulation machines to produce this X-ray environment safely and repetitively in the laboratory. During the last year we successfully developed the technology to build such a simulator capable of producing a [deleted] X-ray environment. This is adequate for satellite materials [deleted]. We will start to build this machine in a facility to be called CASINO this year; it will be completed in about 2 years at the Naval Ordnance Laboratory in White Oak, Md. This is a major part of our request for military construction items, sir.

Chairman ELLENDER. What will it cost to build the CASINO facility?

General DUNN. In terms of construction, about $2.5 million. The problem of how to build such a simulator having an intense enough radiation source to cover an entire reentry vehicle is immensely more difficult, however, the reliability and money savings advantages are sufficient that we need to start on development of the required basic technology. It is not expected that we will have such a machine available for at least 4 to 5 years.

AURORA FACILITY

Last year we discussed the AURORA facility, a machine designed to simulate the ionization effects in complete guidance, flight control, and firing electronic of strategic missiles.

Chairman ELLENDER. Where is that located?

General DUNN. This is the same location, White Oak, Md., sir. This facility, by far the largest in the free world, is now completed and tests [deleted] will start this April. Other important electronic systems tests will follow.

DEVELOPMENT OF ABLATIVE MATERIAL FOR REENTRY VEHICLES

In the field of hardening and hardness assessment of reentry vehicles against the effects of X-rays we note two significant advance during the past year. We have been working, in close coordination with the Air Force, on the development of an ablative material [deleted].

Senator YOUNG. What do you mean by "ablative"?

General DUNN. This is a covering for reentry vehicles that go outside the atmosphere. In reentry they come in and heat up and it has a tendency to blow off as it heats up and, therefore, reduces the heat in the vehicles. It is the same problem NASA had when the astronauts come down. On the front of the space capsule they have a material called ablative material that pops off as it heats and reduces the heat.

[Deleted.] We want a vehicle that would have a fair degree of assurance that it can live [deleted.] So we have to protect against the excessive heat and also the nuclear effects.

We are trying to simulate those and develop materials that can assure our missiles will live in. At the same time we are looking at it from the other point of view of being sure that our ABM is the best possible thing that will overcome an incoming missile [deleted].

So we sit, you might say, on both sides of this spectrum, sir, both our offensive weapons and defensive weapons looking for the total effect of all nuclear environments.

SPARTAN MISSILE

Chairman ELLENDER. For testing purposes it is my understanding that some of these missiles have already been constructed.

General DUNN. They are still in development phase, yes. The final nuclear design of the SPARTAN missile has been completed.

Chairman ELLENDER. Has it been tested to indicate it will be capable of performing its mission?

General DUNN. As far as the nuclear portion is concerned, the Cannikin test, there was a test of the completed nuclear element to see it put out the [deleted] effects we were looking for. But in the SPARTAN system as a whole we are still concerned [deleted]. We are still looking at things [deleted].

Chairman ELLENDER. Is there any question in your mind or that of your colleagues that this weapon is [deleted] sufficient to destroy an incoming bomb?

General DUNN. We know what it will do; yes, sir. And we know within the limitations of what we call "miss-distance"; in other words, the distance it has to come, how close it has to come to an incoming warhead to dsetroy that warhead.

I will ask Dr. Northrop to add to that, but to answer your question categorically, we know what the limitations are and within those limitations we are satisfied that it can do the job.

Dr. Northrop?

Dr. NORTHROP. To make it somewhat more quantitative, the guidance accuracy of the SPARTAN missile as provided by its radar should lead to a miss-distance of approximately [deleted]. This accuracy has been demonstrated in tests at the Kwajalein Test area.

Now, with the demonstrated output of the warhead as shown by the AEC canopy test, we know this defensive missile system will [deleted] on a warhead coming against it.

Within the limitations of what we can determine of the design of these missiles that will come against us, this [deleted] is certainly adequate to kill the incoming warhead.

Chairman ELLENDER. But will this testing you propose prove the effectiveness of the defensive weapon? I thought there was some kind of doubt.

General DUNN. The doubt, I believe, if I can answer it, has been raised on the question of the [deleted] survivability, which is the principal question.

Chairman ELLENDER. That survivability is essential?

General DUNN. Yes, sir; we need [deleted] to get the missiles there. Of course, the hardsite defense program is a research program to extend this [deleted] technology to, or into the future area so that we can look for a better one. This is the best one we have in the current climate and the one that we feel is absolutely essential to have a defense.

TESTS ON HARDNESS OF WARHEADS

Now, at the same time, some of the tests we are carrying on would be particular tests on hardness of warheads. Part of the reason for the tests is to make estimates [deleted] to be sure that we have a means, or to be sure we know what it takes to kill those vehicles.

In other words, we know how close we have to get, with what degree or level of X-ray, let us say. The tests are in order to accomplish this.

MISSILE PRODUCTION

Chairman ELLENDER. Until those tests are made, I presume that the production of the SPARTAN for deployment will be stayed.

General DUNN. The actual production has not started. In other words, that is until this test is developed.

Chairman ELLENDER. You don't propose to do that until you complete the tests?

General DUNN. I can't speak from a responsibility standpoint, because it is not in my area, but I am sure I can assure you it is the intent to complete these tests before weapons production starts.

Chairman ELLENDER. Well, you wouldn't recommend production otherwise?

General DUNN. We wouldn't recommend it be done, that is right.

MISSILE DEVELOPMENT

Development, including flight tests and underground experiments, is essentially complete. The material, [deleted] is a leading contender for the Navy's ULMS reentry vehicle. We have also conducted tests, using high explosive charges, on models of [deleted] reentry vehicles, [deleted].

I believe that answers the question you asked.

RADIATION EFFECTS ON ELECTRONICS

Last year we discussed radiation effects on electronics. Our research is now concentrating on quality control techniques for production hardware, and early evaluation of the coming generation of ultrasmall electronic circuits, so-called medium- and large-scale integrated circuits. One of the more exciting advances in this area, devices called Complementary Metal Oxide Semiconductors (CMOS) will result in appreciable savings of power and improved heat dissipation, in addition to their ultrasmall size. A serious problem had existed in their extreme sensitivity to nuclear radiation. This was solved last year, and the new CMOS is now entering industrial production for application to military hardware. One of the earliest beneficiaries of this breakthrough will be ULMS, which requires both extreme miniaturization and power saving.

INTERIM DEFENSE COMMUNICATIONS SATELLITE (IDCS)

Several years ago we conducted a theoretical vulnerability analysis of the operational communications satellite, the Interim Defense Communications Satellite (IDCS). [Deleted] DNA initiated and conducted a program to provide hardening techniques for the sensitive electronics to match hardening guidelines laid down by the Joint Chiefs of Staff. These techniques were incorporated into the follow-on Defense Satellite Communication System— Phase II. The Air Force has conducted tests which show that these efforts were successful in achieving vastly improved hardness, providing survival against all but a direct attack with relatively close miss distances.

Chairman ELLENDER. Have those tests been made by the Air Force?

General DUNN. Dr. Northrop?

Dr. NORTHROP. Yes, sir.

Chairman ELLENDER. And the successor?

Dr. NORTHROP. Yes.

UTILIZATION OF AEC AND SERVICE LABORATORIES

General DUNN. Let me add, if I might, sir, in all of our work we use either the AEC laboratories or Service laboratories already existing. We are responsible for funding and coordinating and seeing that the work is done but we don't set up laboratories on our own. In other words, we use existing facilities. That is the reason these giant use facilities, such as AURORA, are built actually at one of the Service laboratories. We have another similator of a different type at Kirtland operated for us by the Air Force Weapons Laboratory, so we make a point of not duplicating what the Services are doing and we build only those things which are usable by more than one Service.

If only one Service is affected, then it is a Service-responsibility but in those areas where there is joint interest it is our responsibility.

RUSSIAN DESTRUCTIVE CAPABILITY

Senator YOUNG. Mr. Chairman, I don't know if it is appropriate to ask this question, but I understand that the Russians have far greater capability of destroying our satellite communications and re-

connaissance than we have of destroying theirs. Is there anything you want to say with respect to that?

General DUNN. I am hesitant to answer that question, because it is outside of my field of responsibility and I would prefer that it be asked of the Director of Defense Intelligence Agency.

Senator YOUNG. All right, sir.

General DUNN. I might, if I might go off the record——

(Discussion off the record.)

Chairman ELLENDER. Continue, General.

ELECTROMAGNETIC PULSE EFFECTS

General DUNN. Electromagnetic pulse is the fast burst of extremely intense radio energy which may travel many hundreds or even thousands of miles when a bomb explodes at a high altitude. [Deleted.] During the last year we started construction of a transportable EMP simulator which we will start using early next year to test several critical command links and control centers to investigate their susceptibility and, if needed, design fixes. This program has been carefully planned in cooperation with the Defense Communications Agency. We are jointly starting immediately on the pretest analysis for these tests as well as on development of methods for total network analysis. Fiscal Year 1972 supplemental funds were requested for this purpose.

PROTECTION OF MISSILE GUIDANCE SYSTEMS

We and the Army aso have completed the EMP tests of the two SAFEGUARD missiles, SPARTAN and SPRINT, in our EMP Missile Test Facility at Kirtland Air Force Base. Due to work conducted by DNA over the years to develop methods for protecting missile guidance systems against EMP, these tests were entirely successful in that the missiles were proved completely hard against the threat EMP environment. A similar test for MINUTEMAN III is half completed. [Deleted.]

NUCLEAR DETONATIONS NEAR EARTH SURFACE

ARES with SPARTAN on test stand:

In distinction to this high altitude EMP threat which extends over thousands of miles, a nuclear detonation near the surface of the earth produces in a similar way extremely large currents and voltages over much shorter distances, yet still extending many miles. These can interfere with the proper operation of electronics in hardened sites, such as command posts and missile silos. We have worked on this problem for quite a few years. As a result many older systems now are protected against the effect while newer systems are incorporating protection as part of their initial design.

HIGH-ALTITUDE DETONATIONS

A high-altitude detonation also affects the capability of radars to detect enemy reentry vehicles. This is called radar blackout. Our work in defining the extent of this problem in both time and distance is,

of course, severely hampered by our inability to obtain high altitude nuclear test data because we cannot explode nuclear weapons above ground.

Chairman ELLENDER. How will that affect the ABM system?

General DUNN. It is vital to the system, sir, and we are trying through simulation and mathematical analysis to find the answer. We don't, of course, know the final answer because we cannot explode a high-altitude bomb; but from past knowledge and experience and our simulation, we are making calculations which I shall show later, that we think have a high degree of reliability.

NATURAL AURORA PHENOMENA

Chairman ELLENDER. This past December I was at the South Pole. Before we left the mainland, we were told there was a blackout of all radar and radio. I wonder if that is similar to what you talk about here?

General DUNN. Dr. Northrop can answer that.

Dr. NORTHROP. It is due basically to free electrons in the high-altitude atmosphere. The resulting blackout and breakdown in communication are from the same source. The cause of these charged particles in the atmosphere comes from two different sources. We are speaking of detonation of a nuclear weapon producing ionized debris and causing blackout. What you saw there was undoubtedly an aurora effect in which particles of high energy come from the sun, an entirely different source, but producing a very similar effect.

Chairman ELLENDER. Either one can have the same effect?

Dr. NORTHROP. The same effect physically, in that this ionized material at altitudes essentially makes the air black or opaque to radar or radio beams.

Chairman ELLENDER. I know they were working on it, trying to find out the source of it and how to cope with it. We also had been in the same port for 2½ hours before we established connections with our camp on the ice.

Dr. NORTHROP. You might be interested that in this age when we cannot do atmospheric tests to look at the nuclear effects that the phenomena of ionization and what happens in the air when the energy is deposited, indeed can be studied using naturally occurring aurora. We make studies and research continually on these naturally occurring auroras. Last week we had missile launches in Alaska looking at some of the chemistry and physics that go on during these natural phenomena for precisely this reason.

Chairman ELLENDER. Is it the same kind of material?

Dr. NORTHROP. The basic effects are caused by electrons. This is correct.

Chairman ELLENDER. Which can also be generated by man?

Dr. NORTHROP. Yes.

General DUNN. Through atomic energy.

Dr. NORTHROP. That will produce free electrons and also what particles the sun puts out, primarily protons, when they hit the atmosphere will make free electrons. It is these free electrons that cause the radio beam to be weakened.

IDENTIFICATION AND BEST UTILIZATION OF RADARS

Chaiman ELLENDER. Have you reached a point where you can say that, if it is produced as a result of an aurora, that the same treatment would suffice to eradicate it?

Dr. NORTHROP. We, at the moment, have no way of artificially eliminating this "ionization." What we are doing at present is to identify and predict how much there will be from nuclear explosions to predict how effective the radars will be.

General DUNN. In other words, how to live with it.

Dr. NORTHROP. At this point, we don't have a good way of soaking it up.

General DUNN. Just the same, we have made considerable progress by means of theoretical calculations and by taking advantage of natural meteorological phenomena such as aurora. [Deleted.]

BLOCKOUT OF RADIO COMMUNICATIONS

Another effect of high altitude detonations is the blackout of radio communications, which for some frequencies, is very severe and can last many hours. [Deleted]. All of our radio blackout data came from atmospheric tests held at nighttime and in low latitudes; [deleted]. We know that blackout is strongly dependent on these and many other poorly known atmospheric factors. During the last year we have examined these variations [deleted]. We have also, in the process of this analysis, learned how to make significant improvements in the prediction techniques so as to make them more universally applicable for a greater variety of tactical situations

STRATEGIC TARGET PLANNING

These general improvements in nuclear weapon high altitude detonation prediction techniques have found one additional important application. Strategic target planning is a most complex problem [deleted]. During the last 2 years, we have successfullly incorporated many of these nuclear weapon effects prediction codes into the large computers used by the Joint Strategic Target Planning Staff at Omaha so that these difficult predictions can be made more accurately and efficiently.

Senator YOUNG. Mr. Chairman, are you saying that it could have an effect on the operation of the Minuteman?

General DUNN. Yes, we are definitely saying that. What we say is by these predictions we can [deleted].

Senator YOUNG. Could these weapons, both the Russians and ours, be stopped now?

REENTRY MANEUVERABILITY

General DUNN. Well, certainly the environment that they operate in now is getting more complicated all of the time. This is the reason we now look at the question of maneuverable reentry, to get around some of these areas of defense.

Chairman ELLENDER. Can those areas be detected through some kind of instrumentation?

General DUNN. Yes, sir; through satellites.

Chairman ELLENDER. It would be difficult, however?

General DUNN. It is a complicated affair.

Chairman ELLENDER. I imagine, once the missile is on its way, it would be pretty hard to deter?

General DUNN. Well, this it why we are looking at the possibility of maneuvering the reentry vehicle after it gets near the target.

AURORA-NUCLEAR EXPLOSION DISTINCTIONS

Chairman ELLENDER. Are you satisfied that the problem with aurora is similar to that produced from a bomb?

General DUNN. In this area of X–ray effects; yes, sir. In other words, electrically charged particles.

Chairman ELLENDER. If that be true and you find no method of countering it, what can be done?

General DUNN. We have to learn to live with it and what to do to overcome it.

Senator YOUNG. Mr. Chairman, Mr. Haas seems interested in this. Would you have a comment?

Mr. HAAS. No.

General DUNN. Mr. Haas is the principal expert in the electromagnetic pulse field, and we brought him along because we thought you might have a question; he is assistant to Dr. Northrop.

Dr. NORTHROP. Mr. Haas is right, we ought to note one distinction, aurora are useful in determining, when you have electrons, how harmful they are to a radar beam. However, it will not answer another problem and that is: starting from a nuclear explosion, to specify how many electrons you will get. Our predictions are that one gets quite a few more electrons from a nuclear explosion than from aurora, about 100 times as much per unit volume. A great deal of our theoretical research is associated with trying to determine the electron density produced by nuclear explosions. The second step then is to learn how a given electron density interferes with radar.

Aurora are useful for the second step, but not the first step, which must either be determined by atmospheric tests, which we can no longer do, or by theoretical studies which is a main part of our research.

Senator YOUNG. Off the record.

(Discussion off the record.)

Chairman ELLENDER. Continue.

NUCLEAR EXPLOSION NEAR EARTH SURFACE

General DUNN. Only recently has the dust and debris cloud from a nuclear warhead exploding near the surface been recognized to be of military significance. The familiar mushroom cloud created by the rising fireball sucks up a large mass of soil and rock fragments ranging in size from large rocks to fine dust. Some come from the crater, and some are lofted by the violent in-rushing winds. The cloud carries them up to tens of thousands of feet where winds may spread them to tens of miles. We continue working on techniques of estimating how much material is in these dust clouds, and comparing it to old information obtained from tests in the atmosphere.

1973 MAJOR PROGRAMS

Out of this brief review of our ongoing activities and accomplishments, several important and time-urgent tasks stand out to be accomplished in the coming year.

ULMS

First, major effort will have to be applied in the underground test program in support of the Navy ULMS. [Deleted.]

SIMULATOR DEVELOPMENT

Secondly, we must press forward in our program of simulator development to supplement, and hopefully to eventually replace, underground nuclear tests. Most critical here is our previously mentioned initiation of technology development leading to a [deleted] X-ray generator.

DEVELOPMENT OF MATERIALS AND DESIGN

Thirdly, a major increase is required in our funding of materials and design development leading to a preprototype design of an advanced hardened re-entry vehicle system.

STOCKPILE RELIABILITY TESTING

Fourthly, a recent decision by Mr. Packard, then Deputy Secretary of Defense, directed the initiation of stockpile reliability testing of our present strategic re-entry vehicles. [Deleted.]

Let me add to the statement on that here, in answer to your question about who tests and how we test, Mr. Chairman. As I told you after the initial proof test by AEC of these weapons, normally none of them are exploded. What we are doing here is going into our stockpile and picking out at random one of these reentry vehicles, both its nuclear and nonnuclear component and insofar as we can do it underground we are going to have an actual explosion in its near operational characteristics as we can do it. Included in this budget is money to allow us to do this. This will be done jointly with AEC [deleted].

POSEIDON TESTING

Chairman ELLENDER. You mentioned these tests will be made underground to further aid the development. Would that not also apply to the Poseidon?

General DUNN. We are fast completing the basic tests on Poseidon, and they have been tested underground and some tests still remain.

ULMS

Chairman ELLENDER. As I understood the proponents of the ULMS, the principal virtues of that submarine is the fact that it can be home-based in the United States and that the missile will be larger, so that it can be fired a greater distance. But, as I understood it, virtually the same warhead is going to be used.

General DUNN. Initially, I believe that is true, sir. A later development will be an improved warhead.

Chairman ELLENDER. That would be repeating the history of the Polaris conversion program.

General DUNN. Yes.

Chariman ELLENDER. Are the Poseidon missiles similar to the Polaris missiles, except for the multiple warheads used to provide a greater number of targets?

General DUNN. It is actually for that reason a different warhead because of the multiple type warhead and it travels a different trajectory when it goes a longer distance so there are some modifications.

Chairman ELLENDER. I got the impression the same warhead would be used as that which is used in the Polaris.

Dr. NORTHROP. Initially, a new missile will be developed and the old warhead reentry vehicle combination will be used. This will be followed by the development of a warhead and new reentry vehicle to go with the new ULMS.

Chairman ELLENDER. There is no thinking about retrofitting this to the Poseidon?

Dr. NORTHROP. I do not believe there is any intention of retrofitting the new ULMS warhead back to the old Poseidon.

The basic reason, if I might add, for the longer range is, as you indicated, partly, the advantages of home basing submarines. But equally important, I judge, is that the longer range increases about a factor of 10 the amount of useful square miles of patrolling area, which increases the task of the Soviet defensive system in locating them.

Chairman ELLENDER. I understand that thoroughly, but I was told that, for the present, unless you can get something better, why the same missile that is used in Poseidon will be used in ULMS.

Dr. NORTHROP. Initially, that is correct.

Chairman ELLENDER. That is what I thought and that is the reason I said a while ago that the principal virtues of the ULMS are that it can be home based and can travel a greater distance.

Continue.

General DUNN. [Deleted.]

Fifth, great emphasis has been placed recently on [deleted] the effects of EMP.

We are programing funds for initial study of EMP effects on communications systems and testing using our new TEMPS simulator facility.

Beyond R. & D. efforts in nuclear weapon effects and system hardening against them, two other DNA functions I mentioned earlier deserve brief explanation.

CENTRALIZED MANAGEMENT OF NUCLEAR WEAPON STOCKPILE

Centralized management of the DOD nuclear weapon stockpile commences from the time the weapons are delivered off the AEC production lines, and continues until returned to the AEC for retirement. The chain of command for allocating and distributing nuclear weapons is the same as it is for their use, namely, the Unified Command System. DNA provides the desired centralization within that system.

LIMITED NUCLEAR TEST BAN TREATY SAFEGUARDS

The task involving the Limited Nuclear Test Ban Treaty supports the commitment by the President to the Legislative Branch, and to the people, for the AEC and DOD to maintain the four so-called safeguards. DNA provides direct support of the first three of these safeguards, specifically the conduct of underground testing, maintenance of laboratory facilities and programs, and the ability to reinstitute nuclear testing in the currently prohibited environments.

Support of these safeguards has been modified by cost reduction decisions. Responsiveness to the third safeguard, the readiness to resume testing, has been affected most directly. This support is reported annually in detail to another committee of the Legislative Branch, so I won't cover it further here.

The other lesser, albeit important, functions mentioned previously will not be covered further now, since they are done primarily in-house and have less budget impact.

Mr. Chairman, I have discussed DNA responsibilities to clarify and highlight those functions we retained, as well as those that are new or expanded, as the result of our recent reorganization and charter changes.

1971–73 PROGRAM BUDGET COMPARISON

Now, I will put the DNA program in terms of our budget request. Chart 4 summarizes our Fiscal Year 1973 budget request, with the two previous years' programs for comparison.

(Chart 4 follows:)

FISCAL YEAR 1973 BUDGET

[In thousands of dollars]

	Fiscal year—		
	1971	1972	1973
Operation and maintenance	17,091	19,443	13,970
Procurement	1,010	1,131	446
R.D.T. & E	108,700	119,584	128,741
Subtotal, defense appropriation	126,801	140,158	143,157
Construction	1,036		2,596
Military personnel	18,978	12,967	10,567
Reimbursable program	15,950	8,581	10,657
Operation and maintenance	(3,187)	(20)	(21)
Procurement	(10,414)	(4,554)	(5,636)
R.D.T. & E	(2,349)	(4,007)	(5,000)
Total	[1] 162,765	161,706	166,977

[1] Excludes $2,400,000 for family housing transferred to Air Force.

OVERALL OPERATIONS

General DUNN. As you see, the overall DNA operation is projected at some $167 million including construction, which we understand you do not wish to cover here, and also including reimbursables and military personnel costs, which are not included in our request.

STOCKPILE INCREASE

Chairman ELLENDER. What is involved in the $3 million to increase the stockpile?

General DUNN. That $3 million is the test I was talking about, sir, to pay the cost of digging the hole and taking that weapon out of the stockpile and carrying on that test. I mentioned that we were going to take [deleted] and, of course, since we have to test it underground it means we have to dig a hole in the ground and this is to pay, you might say, administrative cost of just setting up the test procedure.

Chairman ELLENDER. Where will the hole be dug?

General DUNN. At the Nevada Test Site. That is the only place we are allowed to test.

Chairman ELLENDER. All of this is done underground?

General DUNN. Yes, sir.

Chairman ELLENDER. Continue.

BUDGET REQUEST

General DUNN. Our total budget of principal concern to this committee is approximately $143 million, up slightly from fiscal year 1972. I will discuss its main features.

OPERATION AND MAINTENANCE, DEFENSE AGENCIES

Chairman ELLENDER. General, before you start your discussion of the request of $13,970,000 for operation and maintenance, I want to include in the record pages 1 through 6 of the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE

APPROPRIATION: OPERATION AND MAINTENANCE, DEFENSE AGENCIES, FISCAL YEAR 1973

Budget Activities: Intelligence and Communications, Administrative and Associated Activities.

Budget Project: Defense Nuclear Agency.

PURPOSE AND SCOPE

This program provides for the day-to-day expenses of operating and maintaining the DNA, Washington Headquarters and the DNA Field Command at Albuquerque, New Mexico. DNA base support functions at Albuquerque, New Mexico (Sandia and Manzano Bases) were transferred to the Air Force (Kirtland AFB) on 30 June 1971. Pay and allowances for the military personnel assigned to the Defense Nuclear Agency are not included in the estimate for this appropriation, but are provided in the military personnel appropriations.

TOTAL OBLIGATIONS BY PROGRAM ELEMENT GROUPINGS

[In thousands of dollars]

Program element groupings	Fiscal year— 1971 actual	1972 estimate	1973 estimate
Program 3: Intelligence and communications:			
Nuclear weapons operations	14,442	18,276	13,217
Training	1,140	543	
Counterintelligence and investigative activities	20	24	24
Nuclear weapons operations, communications	1,408	520	647
Subtotal program 3	17,010	19,363	13,888
Program 9: Administrative and associated activities: Public affairs	81	80	82
Subtotal program 9	81	80	82
Total direct obligations	17,091	19,443	13,970

DEFENSE NUCLEAR AGENCY

SUMMARY OF OBLIGATIONAL AUTHORITY

[Dollars in thousands]

	Fiscal year—		
	1971	1972	1973
Description:			
Direct obligations	$17,091	$19,443	$13,970
Reimbursable obligations	3,187	20	21
Total obligations	20,278	19,463	13,991
Civilian employees:			
Average number of all employees (Man-years)	1,351	534	495
Number of permanent employees at end of year	1,269	507	484
Direct program:			
Obligations:			
Civilian salaries and benefits	$12,991	$7,175	$7,075
Other operating expenses	4,100	12,268	6,895
Total direct	17,091	19,443	13,970
Reimbursable program:			
Obligations:			
Civilian salaries and benefits	1,624	8	8
Other operating expenses	1,563	12	13
Total reimbursable	3,187	20	21

SUMMARY BY PROGRAM ELEMENT

[In thousands of dollars]

	Obligational authority		
	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Program 3: Intelligence and communications:			
Nuclear weapons operations	14,442	18,276	13,217
Training	1,140	543	
Counterintelligence and investigative activities	20	24	24
Nuclear weapons operations, communications	1,408	520	647
Subtotal program 3	17,010	19,363	13,888
Program 9: Administration and associated activities: Public affairs	81	80	82
Subtotal program 9	81	80	82
Total direct program	17,091	19,443	13,970
Reimbursable program	3,187	20	21
Total program	20,278	19,463	13,991

Defense Nuclear Agency

Explanation of estimates fiscal year 1973

Direct Program. The n et reduction of $5,473,000 between FY 1972 and FY 1973 results primarily from the transfer of base support functions at Sandia and Manzano Bases, Albuquerque, New Mexico to the Air Force (Kirtland AFB) and the transfer of the Nuclear Weapons Technical Training Functions to the Military Departments. These decreases were principally offset by costs associated with relocating headquarters, DNA in the Washington Metropolitan area, reliability testing and annualization of civilian pay raises.

	Fiscal year 1973 obligational authority [In thousands of dollars]		
	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Nuclear weapons operations: Maintain overall surveillance and provide guidance, coordination, advice, or assistance, for all nuclear weapons in DOD custody, including production, composition, allocation, deployment, movement, storage, maintenance, reporting procedures, and retirement. Provide nuclear weapon stockpile information to JCS and act as the central coordinating agency for DOD with AEC on nuclear weapon stockpile management. Provide nuclear warhead logistic information to authorized DOD organizations. Conduct technical standardization inspections of units having responsibilities for assembling, maintaining, or storing nuclear weapons and associated ancillary equipment. Maintain and operate a Joint Nuclear Accident Coordinating Center in conjunction with AEC. Operate the Joint Atomic Information Exchange Group. Investigate and recommend DOD security and safety standards and operating procedures. Perform for the DOD integrated material management, Federal cataloging and standardization of nuclear ordnance items. Perform technical analyses and studies of nuclear related problems. Prepare environmental criteria and design standards for construction of storage and maintenance facilities of nuclear weapons. Provides for command and administration for Washington headquarters and field command	14,442	18,276	13,217
Training: Provides for resident courses of instruction and nonresident briefings for senior officers and authorized civilians requiring orientation or briefing on the overall weapons program and related subjects; and training to technicians and supervisory personnel in the assembly, maintenance, storage, quality control, and radiological monitoring procedures for related nuclear weapons and material	1,140	543	
Counterintelligence and investigative activities: Provides administrative and operational support for internal security activities	20	24	24
Nuclear weapons operations, communications: Provides for long-haul point-to-point leased/Government-owned circuitry, material, and facilities including, but not limited to, access lines for AUTOVON, AUTODIN, AUTOSEVOCOM, and dedicated circuitry in support of the Defense Communications System. Provides for costs associated with telephone service	1,408	520	647
Public Affairs: Provides for all functions which are performed primarily for the purpose of providing official information about Defense Nuclear Agency to the public media. Includes all functions and activities which are performed primarily for the purpose of contributing to better relations and understanding between DNA and all segments of the civilian population to help foster mutual acceptance, respect, and cooperation	81	80	82
Total direct program	17,091	19,443	13,970
Reimbursable program	3,187	20	21
Total program	20,278	19,463	13,991

DEFENSE NUCLEAR AGENCY

SUMMARY OF OBLIGATIONS, BY EXPENSE ELEMENT

[In thousands of dollars]

Expense element	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
Civilian personnel	12,991	7,175	7,075
Travel of personnel	707	886	677
Transportation of things	26	33	51
Utilities and rents	513	140	127
Communications	603	700	827
Purchased equipment maintenance (intra-DOD)	2	3	3
Purchased equipment maintenance (cml.)	208	198	202
Printing and reproduction	9	13	14
Other purchased services	1,093	9,868	4,596
Other supplies	895	373	309
Equipment	44	54	89
Subtotal, direct obligations	17,091	19,443	13,970
Reimbursable	3,187	20	21
Total obligations	20,278	19,463	13,991

1972 APPROPRIATION AND 1973 BUDGET REQUEST

General DUNN. First. Operation and Maintenance: $14 million or $5.5 million less than for fiscal year 1972. Significant decreases were the transfer of base support functions at Sandia and Manzano Bases, Albuquerque, N. Mex., to the Air Force (Kirtland Air Force Base)—$8.6 million, and the transfer of the Nuclear Weapons Technical Training functions to the Military Departments—$535,000. The principal offsetting increases are $3 million for nuclear stockpile reliability testing, $433,000 to relocate DNA headquarters within the Metropolitan Washington area and $211,000 to cover annualization of fiscal year 1972 civilian employee pay raises.

Chairman ELLENDER. Why are these increases necessary?

General DUNN. We are in commercially leased buildings, and GSA has told us the lease will not be renewed. It is part of their program to consolidate defense activities in as few locations as possible, and we are one that will move to a Government-owned facility.

Chairman ELLENDER. That is now constructed?

General DUNN. Yes, it is not fully determined. There are two alternatives now which are under consideration, one is the Forrestal Building which is tied in with another move, and another is in a building south of Alexandria which is Government owned.

PROCUREMENT

Next, Procurement. Our request is for $446,000. This is down some $685,000 primarily due to the transfer of the base support and training functions.

Chairman ELLENDER. Is your procurement request of $446,00 a part of the $69,730,000 request for the appropriation "Procurement, Defense Agencies."

General DUNN. Yes, it is, Mr. Chairman.

Chairman ELLENDER. Mr. Woodruff, has the committee been furnished the details on the various items included in this request?

Mr. WOODRUFF. Yes, sir. The Department of Defense has provided that information, Mr. Chairman.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

Chairman ELLENDER. Before you begin with your discussion of the request for $128,741,000 for R.D.T. & E., I will include in the record the summary statement from the descriptive summary.

(The information follows:)

DEFENSE NUCLEAR AGENCY

FISCAL YEAR 1973 RDT&E DESCRIPTIVE SUMMARY

BUDGET ACTIVITY NO. 7.
TITLE: Other Equipment.
PROGRAM ELEMENT NO. 62707H.
TITLE: Nuclear Weapons Effects.
RDT&E CATEGORY: Exploratory Development.

DESCRIPTIVE STATEMENT: The DNA Nuclear Weapons Effects Program Element comprises the Department of Defense (DOD) program of applied research, development and test associated with the effects of nuclear explosions

and the response of military systems to these effects; includes the DOD portion of joint Atomic Energy Commission-Department of Defense nuclear testing and support of subordinate research, development and test organizations; and provides DOD with nuclear weapons effects information needed to design advanced United States weapons systems, for forces and military installations to perform effectively in nuclear war, and to assess their vulnerability as well as the equivalent vulnerabilities of potential enemies. Such information is also used to guide the development of tactical and strategic doctrine needed for military operations in a nuclear war. Additionally, the Program Element directly supports three of the safeguards related to the acceptance of the limited Nuclear Test Ban Treaty. For effective management of scientific personnel and facilities, this program element consists of thirteen projects (category aggregates) as follows:

EXPLORATORY DEVELOPMENT, DEFENSE AGENCIES

[Dollars in thousands]

Element code	Project number	Title	Fiscal year 1971 actual	Fiscal year 1972 estimate	Fiscal year 1973 estimate
62707H		Nuclear weapons effects:			
	J	Underground tests [1]	$46,339	$46,325	[deleted]
	K	Tests in other environments	6,263	3,072	[deleted]
	L	Nonnuclear tests	4,617	12,583	[deleted]
	N	Aerospace systems research and development	6,915	7,330	[deleted]
	P	Analysis and publications research and development.	2,119	7,994	$3,804
	R	Electromagnetic pulse research and development	2,449	2,418	[deleted]
	S	High altitude effects research and development	8,403	9,142	[deleted]
	T	Laboratory radiation research and development	11,255	9,241	[deleted]
	U	Medical effects research and development	4,062	3,804	3,710
	V	Atmospheric and naval system research and development.	3,003	3,188	[deleted]
	W	Radiation physics research and development	4,071	3,962	[deleted]
	Y	Strategic structures research and development	4,182	5,326	[deleted]
	Z	Transient radiation effects research and development.	5,022	5,199	[deleted]
		Total direct R.D.T. & E., DNA	108,700	119,584	128,741

[1] In addition $3,000,000 are included in the Defense agencies O. & M. appropriation for conduct of reliability testing.

CHART NO. 5.—DNA NUCLEAR EFFECTS PROGRAM

(IN MILLIONS)

Fiscal Year—

1971	$108,700
1972	119,584
1973	128,741

Underground tests.
Tests in other environments.
Non-nuclear tests.
Aerospace systems R&D.
Analysis and publications R&D.
Electromagnetic pulse R&D.
High altitude effects.
Laboratory radiation R&D.
Medical effects R&D.
Atmospheric and naval system R&D.
Radiation physics R&D.
Strategic structures R&D.
Transient radiation effects R&D.

RESEARCH, DEVELOPMENT, TEST, AND EDUCATION

General DUNN. Finally, R.D.T. & E. Our request is $129 million. Chart No. 5 shows a breakdown of this request, with prior years for comparison. It shows a 7.7-percent increase from last year.

The DNA R.D.T. & E. effort is programed under the program element "Nuclear Weapon Effects." The program element is divided into project areas as indicated.

Chairman ELLENDER. Gentlemen, this R.D.T. & E. is part of the $8.6 billion budgeted for R.D.T & E; is it not?

General DUNN. This is correct.

Chairman ELLENDER. All right. Thank you.

General DUNN. Today we have noted examples of activities in a number of these projects; some of them indicate significant changes from last year. The $11 million increase in underground tests arises from three causes: $2 million (along with an additional $3 million of O. & M. funds noted above) is to be used for the Minuteman III stockpile reliability test; $3 million is required for imporved containment technology to insure that the very best techniques are used in underground tests to minimize small radiation releases.

TEST COST INCREASE

Contract settlements at the Nevada Test Site and continuing increases in construction costs have resulted in a 14-percent annual increase in costs of tests, both in the current year and a like amount in 1973, resulting in a $6.5 million increased requirement at no change in level of testing.

Chairman ELLENDER. Is that due to an increase in labor costs?

General DUNN. Primarily. There was a strike that lasted about 6 months and, as a result of that, settlement of that strike, there has been increased costs.

Chairman ELLENDER. What is the nature of the cost attributed to R. & D?

General DUNN. It is cost of preparing for the site, digging the hole, and putting in the containment material and test facility.

Chairman ELLENDER. That is affected by the rise in costs?

General DUNN. Yes.

Dr. NORTHROP. That strike, sir, was approximately a year and a half ago. There was a 3-year wage settlement made at that time. You may recall at about that time construction in particular was going up very rapidly and these cost increases directly reflect the general rise in construction costs.

Chairman ELLENDER. I see.

NONNUCLEAR TEST COST REDUCTION

General DUNN. The $2 million reduction in nonnuclear tests is caused by the anticipated completion of the evaluation of earth properties in support of hardening of underground structures [deleted].

Senator YOUNG. May I ask a question there? What kind of program is this?

General DUNN. In the nonnuclear area, it is where we use principally explosives, chemical explosives to make certain tests and then by calculation determine nuclear effects.

We model structures and we have made other types of tests including some of our simulation tests, anything that is not a nuclear explosion but yet gives us nuclear effects.

Senator YOUNG. You say [deleted] there, and you make reference to hardening.

General DUNN. Hardening such as [deleted].

Chairman ELLENDER. Continue.

ANALYSIS AND PUBLICATIONS REDUCTION

General DUNN. The $4 million decrease in analysis and publications represents a cutback from the $5 million initial funding [deleted] supplied through the DOD Fiscal Year 1972 supplemental funding request, to a level of $1 million per year in succeeding years. In the radiation physics project the $1 million increase is the additional funds necessary to double our current effort in advanced X-ray simulation technology.

Mr. Chairman, this concludes my prepared statement and we are prepared to answer any questions you may have.

Chairman ELLENDER. Any further questions?

Senator YOUNG. No, sir.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond was unable to be here today but has asked that responses to questions he has supplied will be answered for the record. The questions and answers will appear at this point in the record.

(The questions and answers follow:)

NUCLEAR TEST DESCRIPTIONS

Senator THURMOND. General Dunn, describe the significant nuclear tests made above ground by other nations in the past two years.

General DUNN. [Deleted.]

ENVIRONMENTAL EFFECT OF TESTS

Senator THURMOND. In what ways have these tests degraded the environment in which we live?

General DUNN. The above ground tests conducted over the past two years are believed to have added only slightly to the fallout of radioactive material and are not considered to have significantly degraded the environment. A program for measuring increased radiation levels from such fallout and evaluating its biological effects has been going on for a number of years; however, the application of such data in an effort to quantify environmental degradation for the entire population or for a particular country involves assumptions that cannot be completely validated. While a considerable amount of information has been accumulated on the biological effects of exposure to substantial doses of ionizing radiation, the possible effects of extremely low dosage rates over extended periods are insufficiently known to permit firm conclusions about the small incremental exposure rates resulting from nuclear weapons testing.

EFFECT OF RED CHINESE TESTS ON ENVIRONMENT

Senator THURMOND. General Dunn, to what extent would future tests by the Red Chinese degrade environment in which this country has a significant interest?

General DUNN. It is highly improbable that we can predict the number of tests the Chinese will undertake in the future with any degree of reliability. However, should their test program continue at a pace similar to their past efforts, they will not contribute an alarming amount to the total fallout.

FALLOUT FROM FRENCH AND CHINESE TESTS

Senator THURMOND. What areas have been affected adversely by recent nuclear tests conducted by the French and the Red Chinese?

General DUNN. Information available to us indicates the fallout from French and Chinese tests has not increased the radiation by a significant amount. It has been estimated that the accumulated burden of radic nuclides that have been deposited on the surface of the earth from testing has not been increased 10% by the French and Chinese tests. The Chinese tests have affected all areas in the northern hemisphere and the French tests all areas in the southern hemisphere. Although fallout from these tests is widely distributed, the greatest fallout occurred in the mid latitudes.

RADIOACTIVE WASTE EFFECT ON SOUTH CAROLINA

Senator THURMOND. General Dunn, what possible adverse effects could result from the burial of radioactive wastes at the Savannah River Plant in South Carolina?

General DUNN. Because the operation of the Savannah River Plant is under the Atomic Energy Commission, I ask to defer on this question. The safe disposal of atomic wastes is a matter in which the AEC not only has statutory jurisdiction (Atomic Energy Act of 1954) but also one to which they have devoted considerable effort and can best respond to this question.

NUCLEAR PROTECTION FOR TANKS

Senator THURMOND. General Dunn, what is your opinion reference the importance of any new Army tank having some degree of nuclear radiation protection?

General DUNN. As far as the radiation environment is concerned, man is the weakest link in the total tank weapon system. For small tactical nuclear weapons, nuclear radiation becomes the governing criteria. Therefore, I consider it highly desirable to provide that degree of radiation protection to man that is consistent with the tank's capability to survive other nuclear effects.

Senator THURMOND. What studies have been made in this area?

General DUNN. Many analytical and experimental studies have been conducted by the Army, principally the Ballistic Research Laboratory, on existing and proposed tank designs including the Main Battle Tank. The experimental studies have been conducted at nuclear test sites, at nuclear reactors and at other radiation sources. These studies have ranged from assessing the value of natural armor as a radiation shield to evaluating various add-on radiological shield concepts. In addition, integral armor and radiological shield concepts have been briefly examined.

CLASSIFIED QUESTION

Senator THURMOND. General Dunn, what is known about [deleted]?

General DUNN. [Deleted.]

ULMS TESTING

Senator THURMOND. General Dunn, what confidence do you have that the underground test program for ULMS can adequately answer the urgent questions in development of this missile?

General DUNN. Your question specifically refers to the missile and by inference to the re-entry vehicle. Two urgent questions concerned with nuclear survivability of the missile/re-entry vehicle delivery subsystem are:

(*a*) Can we develop realistic threat environments for this long-range case, both for the missile body during boost phase and for the re-entry system during midcourse and re-entry, and

(*b*) Can we develop high confidence that the resulting hardness specifications levels are indeed met.

The underground testing program will contribute some answers to the second question, as will theoretical analysis and laboratory simulation programs. As a matter of fact, all three are required, and in a repeated interactive sequence. The DOD has made notable progress in the area of nuclear survivability during the last five years, primarily by means of iteration. We have worked the problem twice and now have high confidence that both the MINUTEMAN III and POSEIDON missile/re-entry systems will survive in a hostile nuclear environment and accomplish their mission. Underground testing has played an essential role in developing this confidence.

I fully expect that the same process will be required for ULMS, perhaps with somewhat fewer underground tests vice more analysis and laboratory work. In any case, I have high confidence that the right mix will be developed in order to adequately answer urgent survivability questions as they arise.

In the larger context of the entire system including the submarine and command and control systems, there are a variety of survivability questions which are not so amenable to testing underground. Long-range communications in a hostile nuclear environment and submarine hardness to direct or indirect attack are examples. Dr. Foster has mentioned that we are currently working on these kinds of problems, and the detailed testing requirements for ULMS are being worked out. At present, I see no unsolvable problems; in particular, the test facilities required to match analytical and laboratory work are feasible. In short, we expect to develop high confidence in this larger system area also.

A separate aspect to your question is that of funding. Only the initial phases of ULMS underground testing have been worked out in detail, with the result that ULMS testing is reasonably adequately supported in FY 73. As later details are worked out, the required funding in subsequent years may indeed require revision of schedules and funding priorities with the DOD. This will optimize accomplishment of the program rather than attempting to anticipate total system needs at this time.

Nuclear Weapons Material Life Cycle

Senator Thurmond. General Dunn, what is known about the life cycle of material used in nuclear weapons?

General Dunn. The life cycle of nuclear weapon material is primarily related to variations caused by active material decay in limited life components. [Deleted.] Conventional reservoirs are relatively reliable, and have low development and fabrication costs. Their disadvantage is the frequency of replacement necessary for some weapons. At the present time, the weapon laboratories conduct "worst case" tests of yield-varying weapons by using end-life samples of limited life components. Additional yield tests may be conducted by the laboratories if they do not have sufficient experience or confidence in the performance of a particular design. [Deleted] The weapons laboratories are actively studying concepts for extending operationally ready storage times to a period near the expected lifetime of the warhead. [Deleted.]

With the exception of limited life components, existing data on other warhead materials does not provide any basis for placing a specific limit on the operational lifetime of the warhead. [Deleted.] Since stockpile sampling tests have indicated some degradation of the overall warhead with time, an indefinite stockpile life is not projected. Testing of nuclear weapons, exclusive of full scale detonations, is conducted extensively by the Atomic Energy Commission and the Department of Defense during production and throughout stockpile life. Stockpile Laboratory Tests commence at the end of the first year of production and are conducted on weapons randomly selected from the stockpile to determine that there is a continuation of the desired quality level of stockpile weapons. If defective or suspect components are identified by sampling tests, then selective retrofit programs can restore the warhead to an indefinite stockpile status.

Replacement Programs

Senator Thurmond. What nuclear weapon replacement programs are underway in this area?

General Dunn. The replacement programs, other than replacement of limited life components, are not directed at replacing weapons because of nuclear material aging. Continued warhead development is required to provide nuclear capabilities for new weapon systems and to take advantage of advances in nuclear technology.

Personnel Changes Effect and Cause

Senator Thurmond. General Dunn, does the drop in DNA personnel from 19 000 in FY 1971 to 10,500 in FY 1973 reflect only the change in mission or are other factors involved?

General Dunn. The reduction in military personnel costs from $19,000,000 to $10,500 000 results principally from changes in mission, i.e. transfer of Sandia and Manzano base support functions to the Air Force, and the nuclear weapons technical training function to the Military Departments.

BUDGET CHANGES

Senator THURMOND. Why has DNA's budget remained essentially the same during this period?

General DUNN. Mission changes and other management improvement actions resulted in a decrease of about 25.5 million dollars in direct and reimbursable funds during the FY 1971–FY 1973 period. Approximately 9 million of this is O&M, 5.5 million in Procurement, 2.5 million in Family Housing and 8.5 million in military personnel expenses. The R&D mission of DNA, which deals with nuclear weapons effects and accounts for 80% of the DNA budget remains unchanged. Accordingly, decreases are offset by increases of 23 million in RDT&E, 1.5 million in military construction, and 3 million in O&M for reliability testing of nuclear weapons in storage, a new program. With respect to RDT&E, 11.5 million of the increase relates to the Underground Test Program including 6.5 million for increased contractor costs, 3 million for improvement of our containment technology and 2 million for the previously mentioned reliability testing program. Acceleration of the Non-Nuclear Test Program accounts for 6.3 million increase, but is offset by a decrease of 3 million in our Readiness-to-Test Program. Other significant increases are 2.7 million in the reimbursable program and 3.2 million for pay increases to civil service employees.

Chairman ELLENDER. Thank you.

Defense Communications Agency

STATEMENT OF MAJ. GEN. ROBERT D. TERRY, U.S. ARMY, VICE DIRECTOR

ACCOMPANIED BY:

BENHAM E. MORRISS, ASSISTANT DEPUTY DIRECTOR, NATIONAL MILITARY COMMAND SYSTEM TECHNICAL SUPPORT, DEFENSE COMMUNICATIONS AGENCY

J. EDWARD TIMMINS, JR., COMPTROLLER, DEFENSE COMMUNICATIONS AGENCY

RAYMOND M. EAGAN, JR., BUDGET OFFICER, DEFENSE COMMUNICATIONS AGENCY

BUDGET REQUESTS

Chairman Ellender. The next item to be considered is the request of $87,198,000 for fiscal year 1973 for the Defense Communications Agency. These funds are requested in the budget for the Defense Agencies under the following heads:

Operation and Maintenance, $60,051,000.

Procurement $13,235,000.

Research, Development, Test, and Evaluation, $13,912,000.

ABSENCE OF DIRECTOR GENERAL

Chairman Ellender. The principal witness is Maj. Gen. Robert D. Terry, Vice Director, Defense Communications Agency.

You may proceed.

General Terry. Mr. Chairman and Members of the Committee, I am glad to have this opportunity to present the fiscal year 1973 budget request for the Defense Communications Agency.

Our Director General Gould would have been here personally; however, he returned just last night from an extended visit to Europe to attend NATO meetings, and inspect our operations there. He didn't feel adequately prepared after such an extended absence.

Chairman Ellender. You are a good substitute.

AGENCY RESPONSIBILITIES

General Terry. Since the missions and responsibilities of the Defense Communications Agency have been discussed at length in previous years, I will not go over them in detail again. However, to summarize, DCA is responsible for: (a) management control and operational direction of the Defense Communications System; (b) providing technical support to the National Military Command System; (c) support of the National Communications System; (d) assisting the Joint Chiefs of Staff in carrying out their responsibility for the World-Wide

Military Command and Control System standard automatic data processing systems; and (e) overall system engineering of the Minimum Essential Emergency Communications Network. As you know, the Defense Communications System costs are distributed among the budget requests of the military departments and the Defense Communications Agency. The amounts requested by the military departments are discussed by their representatives before this committee.

AGENCY RELATIONSHIP TO COMMUNICATIONS SYSTEMS

Chairman ELLENDER. Now, I understand there has been a reorganization in the Defense Communications area. I wonder if you would furnish information for the record, definitions and the inter-relationship among the Defense Communications System; the National Military Command Systems; the National Communications System; the World-Wide Military Control Command System; and the Minimum Essential Emergency Communications Network. It is also suggested this statement explain in detail the responsibility of the Defense Communications Agency as it relates to each of these various systems.

General TERRY. I understand you would like them defined and to show our relationships in response to them.

Chairman ELLENDER. That is right. Please provide it for the record.

General TERRY. Yes, sir.

(The information follows:)

DEFENSE COMMUNICATIONS SYSTEM (DCS)

The Defense Communications System is comprised of the world-wide communications extensions in support of the Department of Defense. This system is comprised of computers, radio, wire, satellites, and submarine cables which connect the Department of Defense to most areas of the world. Excluded from the Defense Communications System are the post, base, and local area communications systems and tactical systems operated and controlled by field commanders. Examples are the Navy's fleet broadcasts and ship-to-shore circuits; ground-to-air and air-to-air communications of the Air Force and tactical communications of the Army between field units where mobile type equipment is used; and the tactical satellite communications program. Although these local and tactical facilities are not DCS, they must meet DCS standards at any point where they interface with the DCS.

The DCS is essentially an East-West belt. It is a combination of Government-owned and operated and commercially leased equipment and facilities. Included in the DCS are those communications required to interconnect the primary and alternate fixed or mobile command posts of the President, the Secretary of Defense, the Joint Chiefs of Staff and unified/specified commanders, with fixed telecommunications facilities.

The DCS overseas networks are connected by high quality, high capacity, undersea cables and communications satellite systems. These media are predominately commercial resources, operated by domestic or foreign civilian companies. Where these resources are insufficient for our requirements we have installed Government-owned radio systems. In some instances we have had to install our own submarine cables, for example, cables between South Vietnam and the Philippines; plus cable to six enclaves along the coast of the Republic of South Vietnam. The predominant portion of Government-owned facilities is located overseas. Leased service is largely in the CONUS-Canada complex; however commercial satellite and submarine circuits are located throughout the world.

The DCS has in its make-up several sub-systems such as the Defense Satellite Communications System (DSCS) the automatic digital network (AUTODIN) for narrative messages, the automatic voice network (AUTOVON) for voice traffic, and the automatic secure voice communications network (AUTOSEVO

COM). Automatic in this case means automatic switching and routing such as used in commercial systems.

The military departments install, operate, and maintain assigned DCS facilities; budget, fund, and account for support of the DCS; and perform detailed engineering and develop communications requirements. The mission of DCA is to insure that the DCS is planned, engineered, established, improved, operated, and managed to effectively, economically, and efficiently meet longhaul, point-to-point telecommunications requirements of the DoD communications community.

DCA's responsibilities are to plan, engineer and direct the Defense Communications System including integration of Department of Defense activities related to communications satellites. The DCA role may be described as management control and operational direction. Management control is a system overview and results from analysis and evaluation of the DCS. It attempts to discover the best way to operate the DCS and to apply the therapy to the system and to all supporting elements. Operational direction addresses the real time operation of the DCS to insure the best available service to the users and in most cases is applied directly to the DCS operating facilities. System Planning and System Engineering are the comprehensive analyses of all the factors included in the efficient and economical development of a communications system, to include the collection and definition of user requirements, environmental projections, technological projections, strategic policy, missions and management objectives. Transition and long range plans are developed to lead to the desired product. Functional design concepts are developed which will accommodate these factors, and trade-off and cost analysis studies are conducted to surface the design which will meet the DoD user needs in the most efficient and cost-effective manner.

NATIONAL MILITARY COMMAND SYSTEM (NMCS)

The NMCS includes the National Military Command Center, the Alternate National Military Command Center and the National Emergency Airborne Command Post, and interconnecting communications. The NMCS is the priority component of the Worldwide Military Command and Control System (WWMCCS) designed to provide the means by which the President and the Secretary of Defense, as the National Command Authorities, can receive warning and intelligence upon which accurate and timely decisions can be made; can apply the resources of the Military Departments; and can assign military missions and provide direction to the Unified and Specified Commands. It also supports the Joint Chiefs of Staff in the exercise of their responsibilities.

DCA performs system engineering and technical support for the NMCS which includes analytical and ADP support. The NMCS must be continually improved to meet new requirements brought about by changes in military forces and changes in policy with respect to command and control of military forces, or the better satisfaction of existing requirements because of new technical developments and modifications in other parts of the WWMCCS.

NATIONAL COMMUNICATIONS SYSTEM (NCS)

The President of the United States, in White House Memorandum dated 21 August 1963, directed the establishment of a National Communications System (NCS) to provide better communications support to critical functions of government. The President designated the Secretary of Defense to serve as the Executive Agent for the NCS.

The NCS is a confederation in which Federal Agencies participate with their telecommunications assets for the purpose of achieving the following mission: To provide a high assurance of effective satisfaction of the critical telecommunications needs in emergency situations, and to provide effective and economic satisfaction of day-to-day telecommunications needs of the government.

The NCS is comprised primarily of the major telecommunications assets of Federal Agencies, including the Department of State, Department of Defense, the Federal Aviation Administration, the General Services Administration and the National Aeronautics and Space Administration. In addition, the system includes certain assets of the Department of the Interior, Department of Commerce, Atomic Energy Commission, Federal Communications Commission and the U.S. Information Agency. Through this system the day-to-day business of government is carried out, our defense posture is maintained and the continuity

of government is supported in wartime. The mission accomplishment of all Executive Branch agencies is heavily dependent upon the NCS.

The Executive Agent, NCS, has given the Director, DCA, additional responsibility as Manager, NCS. The Director, DCA, as the Manager NCS, in concert with the Operating Agencies, performs the following functions: Defining common objectives; coordinating national and international policy matters; giving visibility to present systems and planned changes; reviewing and coordinating plans of common interest; performing planning on multi-agency projects; conducting long range planning; coordinating R&D projects; acting as a central point for collection and dissemination of specialized technological information; providing leadership in Federal telecommunications standards; providing a central telecommunications management arrangement for dealing with emergencies and emergency preparedness; and providing a central telecommunications management arrangement for dealing with national matters such as the administration of a restoration priority system for the government.

WORLDWIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS)

The WWMCCS is the world-wide command and control system that provides the means for operational direction and technical administrative support involved in the function of command and control of US Military Forces.

The WWMCCS serves two functions as listed in their order of priority and emphasis:

(*a*) Support of the National Command Authorities (NCA) is the primary mission. The NMCS provides the means by which the President and the Secretary of Defense can: receive warning and intelligence upon which accurate and timely decisions can be made; apply the resources of the Military Departments; and assign military missions and provide direction to the Unified and Specified Commands. The NMCS must be capable of providing information so that appropriate and timely responses may be selected and directed by the NCA and implemented. In addition, the NMCS supports the Joint Chiefs of Staff (JCS) in carrying out their responsibilities.

(*b*) Support of the command and control systems of the Unified and Specified Commands and the WWMCCS related management/information systems of other DoD Components is the second mission. This function will be supported by the WWMCCS subordinate to and on the basis of non-interference with the primary mission.

The responsibilities of DCA relative to the WWMCCS are:

(*a*) Management system engineering and operational direction of the Defense Communications System which provides the long-haul, point-to-point and switched network communications support of the WWMCCS.

(*b*) System engineering of the Minimum Essential Communications Network (MEECN) which provides, within the WWMCCS, special, highly survivable, reliable and rapid communications from the National Command Authorities to the world-wide operating forces for execution of time sensitive operations.

(*c*) System engineering and technical support to include analytical and ADP support for the National Military Command System (NMCS), the priority component of the WWMCCS which is designed to support the National Command Authorities and the Joint Chiefs of Staff in the exercise of their command and control responsibilities.

(*d*) Developing and maintaining standard computer software of the WWMCCS Standard ADP systems and providing other technical support, as directed, to the JCS and the Services/Agencies. The WWMCCS Standard ADP systems provide ADP support to the key command centers of the WWMCCS.

MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)

The purpose of the MEECN is to provide a highly survivable, one-way, minimum essential communications net capable of transmission of execution messages to world-wide deployed forces and CONUS defenses regardless of man-made or environmental conditions.

The MEECN is composed of fixed and mobile command centers, relay aircraft, and military department communications. It includes assets that were originally designed for specific operational support and not necessarily designed to be interoperable.

The Joint Chiefs of Staff (JCS) are responsible for management and centralized direction of the MEECN. The Military Departments operate, maintain,

and support the MEECN designated systems and communication assets for which they are normally responsible.

DCA acts as the primary technical advisor to the Joint Chiefs of Staff in the centralized direction of the MEECN. Thus, DCA provides the system engineering to the JCS that will insure survivability, design integrity, compatibility, and interoperability of the present and future network.

BUDGET SUMMARY

General TERRY. To carry out its responsibilities, the Defense Communications Agency request for fiscal year 1973 is $87.2 million in three appropriations: Operation and Maintenance, $60.1 million; Procurement, $13.2 million; and Research, Development, Test, and Evaluation, $13.9 million. I will discuss the significant aspects of each appropriation within the request.

OPERATION AND MAINTENANCE

Chairman ELLENDER. General, before you proceed with your discussion of the request for $60,051,000 for "Operation and Maintenance," I want to include in the record at this point the information on pages 1 through 6 of the justifications.

(The information follows:)

DEPARTMENT OF DEFENSE

Appropriation: Operation and Maintenance, Defense Agencies, Fiscal Year 1973.

Budget Activity: Intelligence and communications.

Budget Project: Defense Communications Agency.

PURPOSE AND SCOPE

The continuing responsibilities of the Defense Communications Agency (DCA) include: management control and operational direction of the Defense Communications System; technical support for the National Military Command System; support of the National Communications System function; and providing technical support for the World-Wide Military Command and Control System (WWMCCS) standard ADP systems.

The budget estimates furnished herewith provide for the operation and maintenance costs of the Headquarters, Defense Communications Agency and its field activity complex. These estimates include civilian personnel salaries and benefits, travel and transportation, reimbursements to host activities, leased communications services and equipment, printing and reproduction, installation and maintenance of communications equipment, rental and operating costs of automatic data processing equipment, other contractual services, and operating supplies and equipment.

DEFENSE COMMUNICATIONS AGENCY.—SUMMARY BY PROGRAM ELEMENT (P.E.)

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
P.E. 3.35.02.K DCA Headquarters	$13,154	$12,129	$12,433
P.E. 3.31.27.K DCA Defense Communications System	17,919	22,508	23,525
P.E. 3.20.16.K NMCS-wide support—DCA	14,346	14,345	18,715
P.E. 3.20.17.K JTSA—DCA	150	4,735	5,378
Total direct DCA obligations	45,569	53,717	60,051
Reimbursable obligations	316	800	800
Total DCA obligations	45,885	54,517	60,851

Defense Communications Agency

DCA HEADQUARTERS

This program provides for the operation and maintenance expense of the Headquarters, Defense Communications Agency. Included are salaries of civilian personnel and personnel benefits, travel and transportation, rents, utilities, reimbursements to host activities, printing and reproduction, other contractual services, and operating supplies and equipment. Pay and allowances for the military personnel assigned to the Headquarters, Defense Communications Agency are not included in this estimate but are provided for in the military personnel appropriation estimates of the respective military services.

The increase of $304 thousand from FY 1972 to FY 1973 results from: $291 thousand for annualization of the 1 January 1972 civilian pay raise and $13 thousand for annualization of the larger government payment for civilian health benefits.

DCA DEFENSE COMMUNICATIONS SYSTEM

This program provides for the operation and maintenance of DCA field activities financed by the O&M appropriation, excluding the National Military Command Support Center and the Joint Technical Support Activity which are in separate program elements. Included are salaries of civilian personnel and personnel benefits, travel and transportation; leased communications services and equipment; lease, programming, and maintenance costs for the data handling and display facilities, contractual engineering services, reimbursements to host activities, supplies and equipment and other expenses incident to operation and maintenance of field activities. Pay and allowances for the military personnel assigned to the Defense Communications Agency field activities are not included in this estimate but are provided for in the military personnel appropriation estimates of the respective military services.

The net increase of $1,017 thousand from FY 1972 to FY 1973 results from: $266 thousand increase for annualization of the 1 January 1972 civilian pay raise; $16 thousand increase for annualization of the larger government payment for civilian health benefits; $51 thousand increase for currency revaluation; $352 thousand increase in host-tenant costs for the DCA field activities; $157 thousand increase in leased communications for annualization of AUTOVON rate increases and increases caused by restructuring Global AUTOVON rates; $51 thousand to cover increased costs of supplies and supply support for additional man years; $318 thousand for full year lease costs of the classified activity computer; and an offsetting decrease of $194 thousand in travel costs.

NMCS-WIDE SUPPORT—DCA

This program provides for the operation and maintenance expenses of the DCA support to the National Military Command System. Included are salaries of civilian personnel and personnel benefits, travel and transportation, supplies and equipment, maintenance and lease of automatic data processing equipment, contractual support and other expenses incident to operating the National Military Command Support Center which provides a technical support to the Office Secretary of Defense and the Joint Staff. Pay and allowances for the military personnel assigned to the National Military Command Support Center are not included in this estimate but are provided for the military personnel appropriation estimate of the respective military services.

The net increase of $4.370 million from FY 1972 to FY 1973 results from: $99 thousand increase for the full year effect of the 1 January 1972 civilian pay raise; $684 thousand decrease in lease and maintenance of automatic data processing equipment because of the purchase of certain ADP components in FY 1972; a $3.5 million increase is due to the revised Worldwide Military Command and Control System (WWMCCS) standard computer acquisition program resulting in a requirement for an accelerated software conversion program originally planned over a five year period, now spread over a two year period; and the remainder is for increased costs per man-year of contractual effort and for additional contractual services required by Department of Defense guidance designating the NMCS as the priority component of the WWMCCS.

WWMCCS–JTSA

This program provides for the operation and maintenance expenses of the Joint Technical Support Activity. Included are salaries of civilian personnel and personnel benefits, travel and transportation, supplies and equipment, lease and maintenance of automatic data processing equipment, contractual support and other expenses incident to operating the Joint Technical Support Activity which has been established to provide centralized technical support to the Joint Chiefs of Staff (JCS), Military Services, Defense Agencies, and the Unified and Specified Commands for the Worldwide Military Command and Control System (WWMCCS) standard ADP Systems. Pay allowances for the military personnel assigned to the Joint Technical Support Activity are not included in this estimate but are provided for in the military personnel appropriation estimates of the respective military services.

The net increase of $643 thousand in FY 1973 is primarily for civilian pay and benefits. The increase provides for the full man-year utilization of spaces first authorized in FY 1972 and thus not filled until the latter part of the fiscal year and for the full year effect of the 1 January 1972 civilian pay raise.

SUMMARY OF DIRECT OBLIGATIONS BY ELEMENT OF EXPENSE

[In thousands of dollars]

Expense element	Actual fiscal year 1971	Estimate fiscal year 1972	Estimate fiscal year 1973
Civilian personnel	21,467	23,159	24,243
Travel of personnel	2,093	2,477	2,295
Transportation of things	177	179	170
Utilities and rents	5,085	6,291	6,204
Communications	5,226	6,068	6,233
Printing and reproduction	167	177	184
Other purchased services	8,194	11,780	17,219
Purchased equipment maintenance	967	1,199	1,224
Other supplies	1,965	1,995	2,003
Equipment	288	392	276
Total direct obligations	45,569	53,717	60,051
Reimbursable obligations	316	800	800
Total DCA obligations	45,885	54,517	60,851

SUMMARY OF PERSONNEL REQUIREMENTS

	Actual fiscal year 1971		Estimated fiscal year 1972		Estimated fiscal year 1973	
	Positions	Man-years	Positions	Man-years	Positions	Man-years
Headquarters:						
Civilian	585	589	506	507	506	506
Military	203	218	180	192	180	180
Defense communications system:						
Civilian	391	419	492	484	492	492
Military	1,155	1,127	1,183	1,169	1,183	1,183
NMCS-wide support:						
Civilian	249	253	240	245	240	240
Military	285	288	227	256	227	227
WWMCCS—JTSA:						
Civilian	3		50	27	50	50
Military	1		19	10	19	19
Total:						
Civilian	1,228	1,261	1,288	1,263	1,288	1,288
Military	1,644	1,633	1,609	1,627	1,609	1,609

Note: The above civilian end strengths include the following part-time employees: Fiscal year 1971, 24; fiscal year 1972 46; and fiscal year 1973, 46. The above end strengths are for the operations account only.

Operation and Maintenance

General Terry. For Operation and Maintenance of the Defense Communications Agency in fiscal year 1973, $60.1 million is requested. These funds support the Agency headquarters and 18 field activities in the United States and overseas areas. These funds appear under four program elements; namely, (1) headquarters, DCA; (2) defense communications system, DCA; (3) national military command system, DCA, and (4) joint technical support activity, DCA. Our total operation and maintenance request of $60.1 million is $6.3 million above the level estimated for fiscal year 1972. A significant part of the increase, $1.1 million is related to increased costs of civilian personnel in all program elements including the full year impact of the civilian employees pay raise and increased Government contributions toward employees' health benefit premiums. The remaining $5.2 million of the increase relates to various items which are addressed in the individual program element justification pages. I shall address the major changes in each program element.

Programs and Personnel

Chairman Ellender. You have in your 1973 program a mix of 1,609 military personnel and 1,288 civilian personnel. You do not include in this account funds for the pay of military personnel.

Military Personnel

General Terry. The moneys to pay military personnel in the Agency are included in the Department amount for military personnel.

Possible Substitution of Civilian Personnel

Chairman Ellender. I wish you could tell us, first, why is it necessary to have so many military personnel in this program, and why can they not be replaced by civilians.

Ranks

I would also like to have you give us the rank and number of your military personnel.

General Terry. Yes, sir.

(The information follows:)

Defense Communications Agency

Summary of military personnel authorized end strengths

	Fiscal year 1973 authorized
09 Lieutenant general/Vice admiral	1
08 Major general/Rear admiral (UH)	3
07 Brigadier general/Rear admiral (LH)	2
06 Colonel/Captain	53
05 Lieutnenant colonel/Commander	143
04 Major/Lieutenant commander	161
03 Captain/Lieutenant	127
02 Lieutenant	32
01 Lieutenant	0
Warrant officer	17
Enlisted personnel	1,150
Total	1,689

Military Personnel: Combat-Support Ratio and Greater Utilization of Civilian Personnel

Chairman Ellender. As I have indicated to previous witnesses, I am attempting to determine the number of military personnel in civilian-type positions. At present, with less than one-quarter of the military personnel in strictly combat assignments, I believe that our defense forces can be strengthened with a monetary saving if civilians were assigned to civilian-type jobs.

General Terry. If I may, I would like to respond briefly to the question on why we use military personnel.

Chairman Ellender. Yes.

Agency Personnel Deployments

General Terry. If you look at the Defense Communications System as it extends from the theater of operations and within the theater of operations back to the United States we have something like 24,000 people involved in all services, and in the Defense Communication Agency in performing this function. They are right alongside the military components in the theater, the combat battalions, and so forth. Consequently, the proportion of military tends to be about 3 to 1 when you look at the overall picture, with the military deployed forward and the civilians being used more as we get back.

If you look just within the Defense Communications Agency and take a leasing function where we commercially lease for all services about $400 million worth of communications a year. In that particular element, we have 228 civilians and only 54 military.

If you take another example, in the Operations Centers, that extends throughout the military structure at each of the unified command headquarters and so forth, and look at that breakdown, we have 960 people authorized for that particular function, and here we have 336 civilians and 624 military, so our military are generally forward and serving with the military headquarters.

Retention of Posture of Moving From Peace to War

Chairman Ellender. I can well understand that during a war. But, in peace why should you need so many? Just to train them?

General Terry. I think in peace, to a large extent, in your headquarters particularly overseas, you try to retain a posture for moving from peace to war in a very rapid time frame, and I don't believe, sir, you would have time to shift your posture, certainly in today's environment, if you manned on a civilian basis and planned to change to a military basis in wartime.

Military Personnel in Other Than Combat Roles

Chairman Ellender. The large number of military personnel designated as other than combat forces, including the large number in civilian-type jobs, leads me to the belief that a disproportionate number of military personnel are in what you refer to as supporting roles. I think there is something wrong in that situation.

Now you may proceed.

CONVERSION TO NEW STANDARD COMPUTERS

General TERRY. Of the increase of $4.4 million in the National Military Command System, $3.5 million is required for the first year of a 2-year program for conversion of software of the National Military Command System (NMCS) to operate on the new standard computers of the World-Wide Military Command and Control System. This conversion is the direct result of the implementation of the World-Wide Military Command and Control System automatic data processing update program. Most of the existing NMCS computers will be replaced by the new standard computers in fiscal years 1973 and 1974. This schedule is dictated by the terms of the Government's contract with the vendor. The NMCS computers themselves are part of our procurement request.

DEVELOPMENT OF IMPROVED GENERAL WAR SUPPORT SYSTEM

The other $0.9 million increase in the NMCS element is to cover an increase in the cost of support to the National Military Command System to continue development of an improved General War Support System responsive to requirements and capable of supporting the National Command Authorities, through the World-wide Command and Control System, during all possible contingencies.

Chairman ELLENDER. Will you tell us the nature of the General War Support System?

General TERRY. This is an Automatic Data Processing program, designed and operated on computers which are located in the basement of the Pentagon and also at Fort Ritchie. These programs are designed to integrate our planning, to aid in presenting the different options which are available to the National Command Authorities and the Joint Chiefs of Staff, and to permit them then to make decisions effecting general war, utilizing the data stored in this computer segment. So it is a large extensive software program, using computers, that provides data necessary for planning and decision during a possible general or nuclear war.

Chairman ELLENDER. To what degree does it assist your planning?

General TERRY. It would assist the National Command Authorities, or assist the Joint Chiefs of Staff, to know how many resources they have, where, and how they could be deployed, what different options are open to them, and so forth.

Chairman ELLENDER. I hope it will not be necessary to depend too much on that to conduct a war.

General TERRY. We are, unfortunately, sir, becoming increasingly dependent on the use of computers, because of the volume of information required and the time of reaction that is available in making decisions. However, we have no intentions of letting the computers make decisions; they are an aid to decision making in an extremely complicated situation.

Chairman ELLENDER. Well, you know, I have been advocating for quite some time now, probably 20 years, that we are now living in a missile age, and for us to prepare for that, as well as conventional warfare, will break the Treasury. Something has to be done with that sooner or later.

General TERRY. I understand, sir.

Chairman ELLENDER. Proceed.

HOST TENANT COSTS, LEASE RATE INCREASE AND CURRENCY REEVALUATION COSTS

General TERRY. In the Defense Communications System, DCA, program element, the major increases are $0.3 million in host tenant costs for the field activities; $0.2 million for leased commercial communication rate increases and $0.1 million of additional costs due to currency reevaluation.

In the Joint Technical Support Activity, there is an increase of $0.2 million related to the full year cost of operating the new computer.

PROCUREMENT, DEFENSE AGENCIES

Chairman ELLENDER. All right, the next item is $13,235,000 included in "Procurement, Defense Agencies" for the Defense Communications Agency. The summary statement in the justifications and the P–1 Exhibit tabulation will be included in the record.

(The information follows:)

OFFICE OF THE SECRETARY OF DEFENSE

Appropriation: Procurement, Defense Agencies.
Budget Activity: Defense Communications Agency.

Summary of obligational authority

[Thousands of dollars]

Fiscal year—	
1971	5,715
1972	5,661
1973	13,235

EXPLANATION OF ESTIMATES

The Defense Communications Agency FY 1973 Procurement provides for equipment to be installed and operated within the Headquarters, Defense Communications Agency and its field activities, for procurement of data processing equipment for the National Military Command System Support Center, Alternate National Military Command Center, and the World-Wide Military Command and Control System—Joint Technical Support Agency. The electronic, communications, and related equipment is required for the Defense Communications Agency to exercise operational and management direction over the Defense Communications System, thereby providing a greater degree of communications responsiveness to authorized users and to provide for improved operational capability and technical support for the National Military Command System.

The Defense Communications Agency FY 1973 Procurement includes the following major requirements:

(*a*) World-wide Military Command and Control System ADP Systems

(1) General Staff Support/Large computer for the World-Wide Military Command and Control System Joint Technical Support Agency.

(2) Force Control computer for the National Military Command System Support Center.

(3) General Staff Support/Large computer for the Alternate National Military Command Center.

(*b*) National Communications System/Defense Communications Agency Operations Center ADP System.

(*c*) Electronic/communications equipment.

(*d*) Office equipment.

EXHIBIT P-1

APPROPRIATION: PROCUREMENT, DEFENSE AGENCIES—FISCAL YEAR 1973 PROCUREMENT PROGRAM

[In thousands of dollars]

Item nomenclature	Unit cost	Fiscal year 1971		Fiscal year 1972		Fiscal year 1973	
		Quantity	Amount	Quantity	Amount	Quantity	Amoun
Worldwide military command and control system ADP systems			784				9,230
ADP systems for command and control					2,830		
NCS/DCA operations center ADP system							1,900
Contractual engineering support autovon/autodin/autosevocom/DSSCS			796				
Digital links between NMCS elements			950				
Query display consoles (NMCS)					500		
Items less than $500,000 each			3,025		2,215		2,000
Spares and repair parts			160		116		105
Total DCA program			5,715		5,661		13,235

COMPUTER SYSTEMS

General TERRY. The Defense Communications Agency procurement request for fiscal year 1973 is $13.2 million. Three new standard computer systems for the World-Wide Military Command and Control System will be purchased at an estimated cost of $9.2 million. This is part of the overall procurement of 35 systems for the Department of Defense. One of the systems is required by the Joint Technical Support Activity for its technical support role in the development and maintenance of software for the World-Wide Military Command and Control System. The other two are for the NMCSSC which provides ADP support to the National Military Command System.

LOCATIONS

Chairman ELLENDER. How many of these systems do you propose to procure for the Defense Department?

General TERRY. Plans are for a total of 35, sir.

Chairman ELLENDER. Would you describe to us that system?

General TERRY. Yes, sir. This is a program to procure standardized computers of three different sizes.

Chairman ELLENDER. All 35 are computers systems?

General TERRY. Yes, sir.

Chairman ELLENDER. Located where?

General TERRY. I will have to provide that for the record. There is a long document detailing the exact locations.

Chairman ELLENDER. Are they located abroad as well as in the United States?

General TERRY. Yes, there are four abroad and 31 in the United States including five in Hawaii. These are designed to standardize automated data processing support throughout the worldwide command and control system.

Chairman ELLENDER. You are initially asking for $13.2 million.

General TERRY. Yes, that is the total DCA Procurement request.

(The list of locations follows:)

COMMANDS/ACTIVITIES SCHEDULED TO RECEIVE THE 35 HIS/WWMCCS COMPUTER SYSTEMS

DEFENSE COMMUNICATIONS AGENCY

Joint Technical Support Activity (JTSA), Washington, D.C.
National Military Command System Support Center (NMCSSC), Washington, D.C.
Alternate National Military Command Center (ANMCC), Fort Ritchie, Maryland.

ARMY

Army Operations Center (AOC), Washington, D.C.
Operations Group, Army, War College (AWC), Carlisle Barracks, Pennsylvania.
Commander in Chief, Europe (USCINCEUR), Stuttgart, Germany.
Commander in Chief, United States Army, Europe (USAREUR), Heidelberg, Germany.
Commander in Chief, United States Army, Pacific (USARPAC), Honolulu, Hawaii.
Military Traffic Management and Terminal Services (MTMTS), Washington, D.C.
Military Traffic Management and Terminal Services/Eastern Area (MTMTS–E), Brooklyn, New York.
Military Traffic Management and Terminal Services, Western Area (MTMTS–W), Oakland, California.
Continental Army Command (CONARC)/Army Atlantic (ARLANT), Hampton, Virginia.

NAVY

Naval Information Center (NAVIC) (Two Systems), Washington, D.C.
Commander in Chief, Pacific (CINCPAC) (Two Systems), Honolulu, Hawaii.
Commander in Chief, Pacific Fleet (PACFLT), Honolulu, Hawaii.
Commander in Chief, Atlantic/Commander in Chief U.S. Atlantic Fleet, (LANTCOM/LANTFLT), Norfolk, Virginia.
Commander in Chief, Atlantic Intelligence (LANTCOMI), Norfolk, Virginia.
Commander in Chief, United States Navy Forces, Europe (USNAVEUR), London, England.

AIR FORCE

U.S. Air Force Operations Center (AFOC), Washington, D.C.
Strategic Air Command (SAC) (Two Systems), Offutt AFB, Nebraska.
Air Training Command (ATC) Kessler AFB, Biloxi, Mississippi.
Continental Air Defense Command Intelligence (CONADI) (Two Systems) Colorado Springs, Colorado.
Continental Air Defense Command (CONAD) Colorado Springs, Colorado.
Aerospace Defense Command (ADC) Colorado Springs, Colorado.
Air University (AU) Maxwell AFB, Montgomery, Alabama.
Military Airlift Command (MAC) Scott AFB, Belleville, Illinois.
Tactical Air Command (TAC) Langley AFB, Virginia.
21st Air Force, McGuire AFB, New Jersey.
22nd Air Force, Travis AFB, California.
Headquarters, Pacific Air Force (PACAF) Hickam AFB, Oahu, Hawaii.
U.S. Air Force, Europe (USAFE) Weisbaden, Germany.

LOCATION AND COST OF AGENCY PROCUREMENTS

Chairman ELLENDER. Cite some of the locations wherein these systems will be placed.

General TERRY. The Defense Communications Agency will obtain only three of these computers for which we are requesting $9.2 mil-

lion. Of the three that the Defense Communications Agency will obtain, one will go into the alternate National Military Command Center at Fort Ritchie and replace two IBM computers that are now there. A second will go into the National Military Command System Support Center in the basement of the Pentagon, which supports the Joint Staff and the National Military Command Center and replace two computers, one IBM and one Control Data Corp., that are located there. The third will be installed initially at the DCA System Engineering Facility, DCA Center at Reston, Va., where it will be used by the Joint Technical Support Activity to provide software support, design, maintenance, and so forth, for the balance of the 35 systems.

Chairman ELLENDER. The present funding request is for these systems?

General TERRY. The funds, or $9.2 million, are to pay for the three systems that I just described, sir.

Chairman ELLENDER. So that each system will cost approximately $3 million?

General TERRY. Around $3 million for each of the DCA Systems. It varies a little.

TOTAL PROGRAM COST

Chairman ELLENDER. What will be the cost of the remaining 32 systems?

General TERRY. I will have to provide the details on those costs for the record, sir. That is part of the overall program.

(The information follows:)

WORLD-WIDE MILITARY COMMAND AND CONTROL SYSTEM (WWMCCS) ADP PROGRAM

Background.—The composition, function and concept of operation of WWMCCS was initially established in an October 1962 Secret DoD Directive S5100.30, entitled "Concept of Operation of the WWMCCS".

In 1966 the Secretary of Defense indicated the desirability of a competitive selection of standardized, off-the-shelf commercially available automatic data processing equipment (ADPE) and supporting software for use in the WWMCCS. The Secretary directed the JCS to study the problem and submit their recommendations.

The JCS recommendations were contained in Development Concept Paper (DCP) No. 75, approved by the Deputy Secretary of Defense in November 1969. This DCP called for standardized ADPE throughout the WWMCCS. The paper identified the WWMCCS ADP community as consisting of 74 command activities with 131 computer systems using 23 different programming languages. Further, it found that, using these various combinations of computer hardware and software, the communication required for crisis management would be unobtainable and would not be responsive to the National Command Authorities (NCA). The study concluded that the ADP requirements of the WWMCCS could be met with the procurement of 87 standard computer systems.

The Deputy Secretary of Defense subsequently limited the initial procurement of WWMCCS new standard computer systems to 35. On 1 October 1970, a Request for Proposal for procurement of up to 35 WWMCCS new standard computer systems was released by DoD.

On 15 October 1971, the General Services Administration, the procurement agency, announced the selection of Honeywell Information Systems (HIS) to provide a family of off-the-shelf computer systems for use in the WWMCCS community. The HIS contract provides for the procurement of 9 computer systems in FY72 and up to 26 additional systems during FY72–73.

The JCS recommended allocation of the 35 HIS/WWMCCS systems was based on the guidance contained in DoD Directive 5100.30, published in December 1971. This revision to the "basic document" of the WWMCCS defined and listed, by priority, the components of the WWMCCS.

The JCS recommendation was approved by the Secretary of Defense on 3 January 1972. By his action, Mr. Laird directed that all 35 of the computer systems available under the HIS/WWMCCS procurement contract should be purchased and installed as recommended by the JCS.

WWMCCS management structure.—The Secretary of Defense is assisted and advised in the WWMCCS matters by the WWMCCS Council, which was established by DoD Directive 5100.30. The WWMCCS Council is chaired by the Deputy Secretary of Defense and has as members, the Chairman, JCS; the Assistant Secretary of Defense (Intelligence); and the Assistant Secretary of Defense (Telecommunications). Within the Office of the Secretary of Defense, the ASD(T) has primary staff responsibility for the WWMCCS.

Functional management of the WWMCCS ADP Program centers around the JCS Project Manager, whose primary responsibility is to expedite the execution of management responsibilities in regards to the WWMCCS ADP Program. The project manager operates within the policy guidance established by the Chairman of the JCS and by the Secretary of Defense.

Implementation schedule.—The implementation schedule for the HIS/WWMCCS computer systems calls for the installation of 6 computer systems in FY72, 21 in FY73 and 8 systems in FY74. The Army will receive 9 systems, the Air Force 15, the Navy 8 and the Defense Communications Agency 3. This schedule provides WWMCCS new standard systems to the "hard core" of the WWMCCS systems community. Included are the National Military Command System, all the SIOP-related unified and specified commands and the Headquarters of the Army, Navy and Air Force.

Funding.—The DoD Budget Submission identifies $47.4 million in FY72–73 procurement funds for the WWMCCS ADP Program. Of this, $16 million was appropriated by the Congress in FY72 and the remaining $31.4 million is contained in the FY73 budget request now being considered by the Congress. The $47.4 million is sufficient to procure the minimum configurations of the 35 WWMCCS ADP systems. As the users refine their specific equipment configurations in progressing from conversion to full operational capability, it is expected that additional FY73 procurement funds will be required necessitating some reprogramming.

Configuration and costs.—The HIS/WWMCCS contract provides for three basic types of computers, each available in a range of configurations. The table below shows the number of each type to be procured and the price range for the minimum and maximum configuration of each type, if all 35 systems are purchased.

[Dollars in thousands]

WWMCCS nomenclature	HIS model designation	Number allowed	Minimum price	Maximum price
Force control	H6070D	6	$1,224.3	$4,903.1
General staff support:				
Large	H6050D	4	1,206.1	5,879.7
Medium	H6050S	25	610.8	2,319.6

REPLACEMENT PROGRAM: REUTILIZATION OF REPLACED COMPUTERS

Chairman ELLENDER. Is this a replacement or modernization program?

General TERRY. Yes, in many locations older, smaller computers are being replaced; in some cases as many as nine or 10 computers will be replaced by a single WWMCCS computer. Many of these commands had wanted to modernize, by acquiring newer, larger computers, a number of years ago. However, the Defense Department had delayed these modernizations until they could initiate the WWMCCS standard computer buy. In some locations, although computers are being replaced, they are not necessarily old or large enough. Many of the computers being replaced will be reutilized by other DoD or Non-DoD agencies. For example, seven of the newer computers are being replaced by WWMCCS computers will be reutilized by the Marine

Corps which will, in turn, replace 10 older, smaller computers they presently have. The basic problem that this program is intended to solve is the lack of standardization. The computers supporting the WWMCCS were manufactured by at least six different vendors, two of which are no longer active; and represented various models of each vendor's product line stretching over about a 10-year period. In addition, the computer programs, or software, at nearly each location was unique. As a result it was extremely difficult to exchange data effectively among the various commands and activities of the WWMCCS. A secondary benefit of the program is economy. It was hoped, by means of a quantity buy, to save on investment costs; I believe this was achieved. In addition, many of the computers being replaced are currently leased. In general, it is more economical to buy, rather than lease computers, if they are to be retained for a number of years. It is also hoped, by means of standardization, to save on the costs of such things as training, maintenance, and software development. This has yet to be realized, of course, but I am convinced that it will also be true.

Chairman ELLENDER. At an average cost of about $3 million, the total cost of 35 would run over $100 million. Will that, in any manner, save manpower?

General TERRY. The systems DCA plans to acquire are relatively larger and more expensive than the average. The total cost for 35 computer systems is approximately $50 million. Since, in general, existing computers are being replaced, I would not expect large reductions in manpower.

Chairman ELLENDER. That is a lot of money for computers. I am not sure I understand why you need so many.

General TERRY. Most of the new computers replace existing computers. The 35 new systems will replace about 85 older computers, some of which are quite small. As a result, we are not acquiring as large an increase in computing capacity as would be implied by the acquisition of 35 systems.

Chairman ELLENDER. These systems will be spread throughout the United States.

General TERRY. Yes, and four overseas.

ESTABLISHMENT OF INTEGRATED COMMAND SYSTEM

Chairman ELLENDER. Will these systems be in any manner interrelated?

General TERRY. That is the eventual goal, to standardize, so that the command systems can all operate as part of an integrated command system.

Chairman ELLENDER. Your position is that such systems would assist in the conduct of a war?

General TERRY. I think the whole point is that we would be able to utilize these systems, to assist in conducting a war by the rapid response that we will obtain throughout the system. Again, we have no intention to have these computers "conduct a war."

OPERATIONAL DATA AND JUSTIFICATION REQUIREMENT

Senator YOUNG. Mr. Chairman, may I ask a question?

Chairman ELLENDER. Yes, sir.

Senator YOUNG. When do you plan to have all 35 systems in operation?

General TERRY. The contract provides for the total of the procurement to take place in fiscal year 1972 and fiscal year 1973, so the equipment must be contracted for by this period, or within that period. All 35 systems must be installed before January 1974. However it will take some time after that before all 35 are fully operational.

TOTAL PROGRAM

Senator YOUNG. Don't you have any figure as to the end cost?

General TERRY. The total program is not a part of the DCA budget. We can obtain those figures for you, and provide them for the record.

(The information follows:)

WWMCCS ADP PROGRAM PROCUREMENT COSTS

The DoD budget submission identifies $47.4 million in FY–1972 and FY–1973 procurement funds for the WWMCCS ADP Program. Of this, $16 million was appropriated by the Congress in FY–1972 and the remaining $31.4 million is contained in the FY–1973 budget request now being considered by the Congress. The $47.4 million is sufficient to procure the minimum configurations of the 35 WWMCCS ADP systems. As the users refine their specific equipment configurations in progressing from conversion to full operational capability, it is expected that additional FY–1973 procurement funds will be required, necessitating some reprogramming.

The total procurement end cost programmed for the WWMCCS ADP Program is $47.4 million broken out as follows:

[In millions of dollars]

Army	9.4
Navy	10.3
Air Force	18.4
DCA	9.2
Total	47.4
Fiscal year 1972	16.0
Fiscal year 1973	31.4

JUSTIFICATION REQUIREMENT

Senator YOUNG. You would have to make a much better case for it before I could vote for it.

General TERRY. I may not have used the best language to clearly identify the total program.

Senator YOUNG. In order for you to have the support of this committee, I would suggest that you provide the end costs, the installation dates, the need for the systems, the inadequacy of the present system, and other related information.

General TERRY. Let me ask the Deputy for NMCS to add to this.

Mr. MORRISS. I will have to get the exact number, however the total program is $47.4 million for procurement of the 35 systems.

The overall request for these funds is distributed among all of the military departments and Defense agencies which are involved in the program. The part associated with DCA is $9.2 million. The objectives of the program are twofold. We are trying to improve operational capability through standardization, ability of the systems to work together and for the people working on the system to more effectively exchange information since they are working in a somewhat standard environment.

The other objective is efficiency. Much of the equipment that is being replaced is not owned by the Government, but it is leased. In addition, much of the equipment being replaced is so old or small as to preclude efficient operation.

AGENCY PROCUREMENT

I can give numbers with respect to our specific part of the program. With respect to two systems of the three for which procurement funds are being requested, one goes into the Pentagon and supports the National Military Command Center there and the second goes into the alternate command center underground. We have, at the moment, six medium to large machines in these two locations. When we get through, we will have the two that we are now requesting funds to procure, and one which is presently owned, an end total of three command center machines. Of the six presently installed computers, we are currently leasing four. One of the four will be removed by the end of fiscal year 1972, and current plans are for removal of the other three by the end of fiscal year 1974. Of the two machines that we now own, one will be removed in fiscal year 1974 and one will be retained.

AGENCY LEASE AND MAINTENANCE COSTS

With respect to the lease and maintenance of our present inventory, which includes not only the equipment being replaced but all other equipment installed in the NMCSSC and ANMCC, $5 million in fiscal year 1971, $4.4 million in fiscal year 1972 and $3.8 million in fiscal year 1973, have been programed or budgeted. At the end of our transition, in fiscal year 1975, the lease and maintenance cost to support the National Military Command System will be $1.9 million. This $1.9 million will cover not only the maintenance of the two new systems for which fiscal year 1973 procurement funds are requested, but other equipment presently installed and either owned or leased. To this $1.9 million must be added, $0.3 million to maintain the new computer for the JTSA, the third new computer for which fiscal year 1973 procurement funds are requested. Out of this total lease and maintenance cost of $2.2 million, the total cost to maintain the three new computers will be approximately $1 million.

So there are significant reductions in our annual lease costs. We are not necessarily going out and procuring something which is new, not in the inventory, but are replacing equipment which in our case is now primarily being leased will result in certainly lower costs if you amortize over the expected lifetime of this equipment even taking into account the appropriate discount of dollars, its present worth versus future worth. In other cases, not DCA, obsolete equipment is being replaced, some as much as 10 years old. In summary, one of the results of the program is economy.

Senator YOUNG. Would they all be purchased from one concern? Would there be uniformity?

Mr. MORRISS. There has been competitive procurement conducted and Minneapolis-Honeywell was the winner of the competition. They will provide all 35 systems, three major types, but of uniform design.

Chairman ELLENDER. Will you own these?

Mr. MORRISS. Yes, sir.

Chairman ELLENDER. Outright?

Mr. MORRISS. Yes, sir.

Chairman ELLENDER. And the maintenance cost you say would be about $1 million?

Mr. MORRISS. Yes, $1 million for the three new computers for which we have requested fiscal year 1973 procurement funds.

Chairman ELLENDER. Only the three?

Mr. MORRISS. Yes, sir.

Chairman ELLENDER. What is the cost of the lease on the present equipment that will be replaced by these three you are requesting?

Mr. MORRISS. $2.4 million will be paid in fiscal year 1973 for lease and maintenance of equipment in the NMCS which will be replaced by two of the computers, one in the Pentagon and one in the ANMCC. The third new system will not replace existing equipment. It is for the Joint Technical Support Activity which was newly created last year and had no previous ADP equipment.

COST VARIANCE OF PRESENT INVENTORY AND NEW SYSTEMS

Chairman ELLENDER. What I want to know is, what does it cost to lease the systems you now own in contrast to the maintenance you are going to have to pay on the three new systems? Can you give that information?

Mr. MORRISS. Yes, sir. We do not now own the bulk of the equipment. We are leasing it. We own some portions of it. But the majority of it is leased. We do not have a third system today. It is a new responsibility of the agency to provide centralized common support to all of the 35 computers in the program. It was concluded this would be best done by having a Central activity provide this support rather than having each of the activities taking care of itself.

For two of the new systems which we are requesting, we will be releasing four computers. Of these four systems, three are now leased. We have owned the remaining one for a number of years. For this equipment to be replaced, we will pay $2.4 million for lease and maintenance in fiscal year 1973. When we are through in fiscal year 1975, we will be paying about $0.7 million for maintenance of the two new systems which replace the four older systems. The reduction in lease and maintenance costs for these systems is therefore $1.7 million. In addition, we will pay about $0.3 million in fiscal year 1975 for maintenance of the third new system which is not replacing present equipment. The difference between these costs and those I gave earlier represents primarily costs related to equipment which is not replaced. ($1.5 million in fiscal year 1973 and $1.2 million in fiscal year 1975.)

Chairman ELLENDER. You mean, after the installation of the system?

Mr. MORRISS. After going through the transition.

Chairman ELLENDER. After the 35 systems are installed?

Mr. Morriss. After actually we procured the two in our program that have to do with replacement of equivalent facilities that are there today, sir.

Chairman Ellender. Will the installation of these three, which will cost $9 million, as I understand it, reduce your O. & M. costs?

Mr. Morriss. Yes.

Chairman Ellender. By $1.7 million. What is the total O. & M. cost of the current machines?

Mr. Morriss. The equivalent of $3.8 million is the total cost for leasing and maintaining computers in support of the National Military Command System in fiscal year 1973.

Chairman Ellender. So it will cost you a million dollars just for maintenance?

Mr. Morriss. Yes, sir.

Chairman Ellender. Even though you own them?

Mr. Morriss. Yes, sir. The maintenance costs for the three new systems in fiscal year 1975 is about $2 million. Total lease and maintenance for both the NMCSSC and JTSA in that year is $2.2 million.

Chairman Ellender. Any questions.

Senator Young. No, sir.

Chairman Ellender. Proceed, General Terry.

National Military Command Systems

General Terry. Systems are also required for the two fixed command center locations of the National Military Command Systems, where the Defense Communications Agency is responsible for providing computer support.

Defense Communications System

In support of the Defense Communications System we are also requesting $1.9 million for a data processing system at the National Communications System/Defense Communications Agency Operations Center (NCS/DCAOC) to replace an assortment of data processing equipment which was installed in 1961 and 1963.

Chairman Ellender. Are those owned by the Government?

General Terry. Yes, the two equipments are owned by us.

Chairman Ellender. What does it cost to maintain these?

I want to be able to secure information on which to make a decision as to whether it is better to buy this new equipment or to use what you now have.

General Terry. We will replace one Philco 2000 and two Philco 1000's and one IBM–1410 and our current maintenance cost for that equipment is $346,000 per year. After we have made the substitutions, we expect the maintenance cost to be $146,000 per year.

Now, we are doing two things: We are replacing the older equipment and we are adding a capability to interface with our regions throughout the DCS, so that our expenditure of the $1.9 million for a computer for the operations center replacing four old computers, cuts our maintenance costs and increases our capabilities.

Chairman Ellender. All right. Continue.

NCS/DCAOC Data Processing Equipment Upgrade

General Terry. The upgrade of the NCS/DCAOC data processing equipment is the next step in an evolutionary approach to system de-

velopment that is designed to meet the continuing growth of ADP support requirements in the most cost-effective manner. Existing equipment does not have the speed or expansion capacity to satisfy projected requirements of the system. In the categories of items under $500,000 and spares and repair parts we are requesting $2.1 million for procurement of electronic communications and cryptographic equipment to replace or improve operational systems in Defense Communications Agency field activities.

Chairman ELLENDER. If there are no further questions or comments on the procurement request we will proceed with the request for R.D.T. & E.

Senator YOUNG. I have no more questions, Mr. Chairman.

Chairman ELLENDER. The request for $509.9 million for "Research, Development, Test, and Evaluation, Defense Agencies" includes $13,912,000 for the R. & D. program of the Defense Communications Agency. The summary statement on pages 157 and 158 of the justifications will be included in the record at this point.

(The information follows:)

DEFENSE COMMUNICATIONS AGENCY

RESEARCH AND DEVELOPMENT PROJECT LISTING

BUDGET ACTIVITY 7—OTHER EQUIPMENT, OPERATIONAL SYSTEMS DEVELOPMENT

[In thousands of dollars]

Element code and title	Project No.	Fiscal year— 1971 actual	1972 estimate	1973 estimate
33127K—Defense communications system (DCS): Communications satellite project (CSP)	50100	3,000	3,200	2,700
Subtotal DCS (CSP)		3,000	3,200	2,700
32016K—National military command systemwide support (NMCS):				
Technical support to the JCS–13	20000	1,304	0	0
ADP systems technical support	20200	1,540	700	700
Technical support to JCS regional programs	20300	108	0	0
Technical support to Joint secretariat	20400	62	0	0
Technical support to Saga	20500	103	0	0
Technical support to JCS–14	20600	350	0	0
Analytical support to OASD (systems analysis)	20800	100	0	0
Technical support to JCS–15	21000	100	0	0
Weapons allocation techniques	21400	33	0	0
JCS–J3 engineering support	22000	0	300	300
Subtotal NMCS		3,700	1,000	1,000
32017K—Worldwide military command and control system: Joint technical support agency (WWMCCS–JTSA): Support of WWMCCS–JTSA	27000	1,500	1,600	1,720
Support WWMCCS–JTSA		1,500	1,600	1,720
33127K—Defense communications system (DCS):				
DCA-DCS operations research	10200	100	0	0
Advanced simulation techniques	10300	1,077	700	700
DCS survivability studies and analyses	10500	1,077	700	700
Transmission and switching R.&D	12100	425	402	0
Advanced communications development	12400	1,054	1,490	1,460
Secure communications R.&D	12600	118	2,010	0
DCA system engineering facility	40000	2,130	2,639	2,752
Subtotal DCS		5,100	7,821	5,492
33131K—Minimum essential emergency communications network (MEECN): Support of MEECN	28000	1,000	3,000	3,000
Subtotal MEECN		1,000	3,000	3,000
Grand total DCA		14,300	16,621	13,912

RESEARCH, DEVELOPMENT, TEST AND EVALUATION

General TERRY. In support of the Defense Communications Agency responsibilities for Research, Development, Test and Evaluation the budget request for fiscal year 1973 is $13.9 million which is $2.7 million less than the request for fiscal year 1972. The decrease is in the Defense Communications System requirement where a planned switch development and some minor developments have been deferred or canceled.

DEVELOPMENT OF SYSTEMS CAPABLE OF TRANSMITTING ALL TYPES OF COMMUNICATIONS

Chairman ELLENDER. Is the research to find ways to improve the present system?

General TERRY. We accomplish several tasks with research and development money for the DCS.

Of this $13.9 million, the R. & D. for DCS runs about, and I want to give you the exact figure here, $8.2 million; and that $8.2 million now is broken down to where we are now spending $2.7 million in support of satellite efforts and $5.49 million for the balance of the Defense Communications System.

Chairman ELLENDER. That is research and development?

General TERRY. Yes, sir.

Of that $5.49 million, there is $2.7 million that supports the systems engineering facility which is our engineering effort to design the future defense communications systems. Their efforts are projected out for the next 10 years.

Chairman ELLENDER. This research and development is done, I suppose, to improve your present facilities.

General TERRY. For two things: To improve our present facilities, also to get prepared for a proper system in the future that will satisfy defense needs.

Chairman ELLENDER. Distinguish between the request you have made for the 35 systems and the request for the DCS item.

General TERRY. The 35 systems that we are talking about, sir, are basically computer installations and the use of these computer installations will be to store data and analytical programs that the different headquarters within the Worldwide Command Systems can use to facilitate the direction of the armed forces of the United States. They eventually will be connected together so that the information in one computer can be transferred to another computer and the data then that all of these headquarters will require can be uniformly available to them.

Now, that is basically a portion of the Command Control problem. Separate from but related to it is the problem of the communications systems which will handle the transmission of all types of information.

Chairman ELLENDER. For which you still require research?

General TERRY. Yes, sir; that is what I am addressing now under this research, development, test, and evaluation.

SYSTEM AUTHORIZATION AND CONTRACT

Senator YOUNG. You said a while ago you already had entered into a contract. How much did we appropriate last year for this purpose?

General TERRY. Let me see, for the Defense Communication Agency, I can give a specific figure.

Senator YOUNG. Was this specific program authorized last year? Has it been authorized?

General TERRY. The specific overall Worldwide Military Command Control's ADP system has been approved by the Congress and the moneys for that have been included in each of the Service and Agency budgets. So what we are doing now is implementing a program presented to the Congress I think at least in the last 2 years. Congress had reservations 2 years ago and requested that the General Accounting Office make a serious study. The Congress held up action until they got the report of the General Accounting Office.

Last year a competitive contract was awarded to the Minneapolis-Honeywell Co. permitting a buy of up to 35 computer systems to meet the requirements. What we are doing today is identifying the need for funds for three of these 35 systems, which are a part of the Defense Communications Agency budget request.

Does that help, sir?

Senator YOUNG. It helps somewhat. This is a little different procedure than that ordinarily followed.

Mr. Chairman, I must leave now. I will read the rest of the statement.

DEFENSE COMMUNICATIONS SYSTEM

General TERRY. For the Defense Communications System, including the Defense Communications Satellite project, we are requesting $8.2 million. Reliable communications for command and control are essential for support of our nuclear forces. We are therefore developing new communications techniques and systems and upgrading existing systems.

DEFENSE SATELLITE COMMUNICATIONS SYSTEM

In the Defense Communications Satellite project, the Defense Communications Agency is the system engineer and program manager. In the project which supports this activity there is a decrease of $500,000 below the fiscal year 1972 level. We do not have the large expenditure for hardware for the systems simulation facility that we had last year. Engineering analysis and development of system performance data for the Phase II program and the U.S. portion of the NATO system will be continued into fiscal year 1973.

ENGINEER SUPPORT OF U.S. NATO NEGOTIATIONS FOR POSSIBLE NATO PROGRAM

Chairman ELLENDER. What is the total cost of the Satellite project? How much is in support of the NATO system?

General TERRY. The bulk of the money, $2.7 million, that we are talking about here, has to do with supporting the U.S. satellite phase II program. There is no NATO involvement with that program. A portion of the engineering effort, which is about $1.6 of the $2.7, is to support our U.S. system. We are providing engineering type support to the U.S. element of NATO.

Chairman ELLENDER. Will this be done jointly with the NATO representatives?

General TERRY. Yes, sir; and the method of funding and everything will have to be worked out.

Chairman ELLENDER. Why should we appropriate money before we determine whether our NATO allies will be willing to cooperate?

General TERRY. There appears to be a considerable degree of interest in discussing it.

Chairman ELLENDER. There may be considerable interest in discussing it, but the United States stands a much better chance of securing cooperation in the financing if an agreement is reached prior to the development rather than after.

General TERRY. I share your concern on this aspect, sir. What we are doing right now is no more than providing engineering support for our U.S. negotiators in this environment so they can join with their counterparts.

Chairman ELLENDER. The $1.6 million is a substantial amount.

General TERRY. Actually the NATO support is only a small portion of the $1.6 million on the satellite. I think I can give you the exact figure here.

Chairman ELLENDER. What will the entire cost be?

General TERRY. The only NATO support that is included in the budget, is a small portion of a $1.6 million systems engineering and technical assistance contract, which we have with the Computer Science Corporation, where we expect to use a few engineering man months of that amount to help work on the engineering aspects of our negotiations with NATO. We are talking of $20,000 or $25,000 at the most. That kind of level of expenditure.

Chairman ELLENDER. This is all exploratory?

General TERRY. Yes, sir, we are not building anything of this type.

DEFENSE COMMUNICATIONS SYSTEM

General TERRY. Concurrently, we are providing for improvement of methodology for study and analysis of the suvivability of the Defense Communications System, and conducting analysis and tests to determine whether the system will function in the electromagnetic pulse environment created by exoatmospheric nuclear detonations. Development and application of advanced simulation techniques will provide the means to optimize operation of the present and future networks and systems. To accommodate the increasing amounts of digital traffic in the Defense Communications System of the future, new techniques and concepts will be investigated, models developed and tested. Overall system engineering will be performed by the System Engineering Facility.

NATIONAL MILITARY COMMAND SYSTEM

For this program element our request totals $1 million. A review of strategic command and control concluded that our current posture is inadequate to meet our objectives. Among corrective measures in progress, we are standardizing data processing systems which support the World-Wide Military Command and Control System. For systems engineering, systems analysis and design to continuously improve the effectiveness and capabilities of the National Military Command System automatic data processing systems and of the

special purpose communications systems used in concert with the world-wide system.

Chairman ELLENDER. Do you have a breakdown of the cost?

General TERRY. There is seven-tenths of $1 million, of this $1 million we are talking about, that is devoted to improvement of automatic data processing systems used in supporting National Command Authorities and $300,000 is for systems engineering of communications and systems and so forth.

Chairman ELLENDER. All of this is in the research field, with no hardware being bought?

General TERRY. No, it is all in the research field, sir.

Chairman ELLENDER. All right, continue.

JOINT TECHNICAL SUPPORT ACTIVITY

General TERRY. The Joint Technical Support Activity will undertake study, analysis and development to overcome some of the problems in exchanging data within and among command centers of the worldwide system for which we are requesting $1.7 million. Among the problems requiring early solution are those associated with computer security and computer netting using a distributed data base.

MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK

For the Minimum Essential Emergency Communications Network we are requesting $3 million in fiscal year 1973. These resources will be applied to system engineering, analysis, planning, test and evaluation and to other developments necessary to improve the reliability of this system which will be a highly survivable network capable of transmission of messages to world-wide deployed forces regardless of environmental conditions.

Mr. Chairman, this concludes my statement. I would be pleased to respond to any questions you might have.

Chairman ELLENDER. Is there an assistant Secretary in charge of the communications system?

General TERRY. Yes, sir. There is a new Assistant Secretary of Defense for Telecommunications. This position has been established as recently as February, sir, after approval by the Congress.

Chairman ELLENDER. I have written to Mr. Laird for detailed information on intelligence operations and expect to receive a reply before any decisions are made on these related areas, such as the 35 computer systems.

Is there anything else you desire to add to what has been stated?

General TERRY. No, sir.

QUESTIONS BY SENATOR THURMOND

Chairman ELLENDER. Senator Thurmond has asked that responses to questions he has supplied will be answered for the record. The questions and answers will appear at this point in the record.

(The questions and answers follow:)

Obligation of 1972 Funds

Senator Thurmond. General Terry, did your agency obligate or expend all of the funds appropriated in FY 1972?

General Terry. Before the end of this fiscal year, we plan to obligate most of the funds appropriated in FY 1972. The expenditures or outlays will follow the obligation pattern with some lag due to delivery schedules and actual receipt of bills.

In the annual Operation and Maintenance account we expect to obligate all of the funds that have been made available to this Agency. As of the end of March a little over $2 million was still being held in deferred status by the Office Secretary of Defense, pending final decision on the requirements of the Joint Technical Support Activity.

In the RDT&E account, of the $15.9 million appropriated, we plan to obligate by 30 June 1972 all but $1.3 million which will probably be committed but remain unobligated due to administrative lead time required to complete contractual actions.

In the Procurement account $1.474 million of the $7.135 million appropriated to DCA will not be used by DCA but has been programmed for other purposes due to reductions in DCA requirements. Of the remaining $5,661 million, based on past experience $2.7 million may be expected to remain unobligated as of the end of FY 1972 due to unplanned events in the contractual process that results in program slippage.

Disposition of Funds

Senator Thurmond. What disposition would be made of any unused funds?

General Terry. It is anticipated that any unused O&M funds would be identified by the Assistant Secretary of Defense Comptroller as an offset against the total requested O&M, Defense Agency FY 1972 supplemental appropriation request for the civilian pay raise. Otherwise, any unused funds would lapse since the O&M appropriation is not available for obligation after 30 June 1972.

In RDT&E the estimated unobligated balance of $1.3 million shown in the budget does not represent a planned unobligated balance in the sense that specific line items or projects included in the budget are not planned for obligation. The unobligated balance is required to complete the financing of the Research, Development, Test and Evaluation program because all technical programs and projects are programmed for accomplishment with the full use of these funds. In estimating an unobligated balance, cognizance is taken of the many factors that inhibit prompt obligation. It should be noted that the estimated RDT&E unobligated balance reflects the amount that may be expected to remain unobligated on 30 June 1972 on a DCA-wide basis due to difficulties in procurement specifications and contract negotiations.

Of the $1.474 million of Procurement funds programmed for other purposes, $1.4 million has been identified in the budget request as available to finance subsequent year budget plans and this is an offset against the FY 1973 total request. $77 thousand was transferred to the Office of the Secretary of Defense to finance a higher priority requirement. The estimated $2.7 million unobligated balance in Procurement is required for financing of programmed items for which contract action will not be fully completed on 30 June 1972. A request for proposals has been issued for more than $2 million of the balance and finalization of these actions should be accomplished and the funds obligated early in FY 1973.

In-House Use of Funds

Senator Thurmond. DCA's O&M account for FY 1973 is $60.1 million. Is this an in-house operation or is this work mainly performed by outside contractors?

General Terry. The DCA O&M account is used primarily for in-house operations. For example $24.2 million or 40% of the $60.1 million total is for pay of civilian personnel salaries. Most of the remainder of the $60.1 million provides for support costs of the in-house operations, including travel, transportation, supplies, equipment, communications, lease and maintenance of equipment and buildings, utilities and printing. Service support contracts account for $13.5 million or about 22% of the total O&M account.

Degradation of Capability

Senator Thurmond. What degradation of needed capability exists as a result of the NMCS being inadequate to meet our current objectives?

General Terry. Because of short reaction time required to meet current threats, there is a need to improve the automation involved with providing the President, Secretary of Defense and JCS more accurate, timely, and complete information relative to incidents and also involved with disseminating and executing their decisions once made. Therefore, subsystems must be interoperable; computerized data formats must be standardized; and communications links must provide direct connection or real-time relay wherever necessary for time sensitive operations. Further, the objectives or the survivability of the NMCS and its capability to communicate are of increasing concern as threats continue to increase. A number of programs are underway or have been proposed to correct deficiencies, for example, the WWMCCS standard computer procurement, the advanced airborne command post, the Minimum Essential Emergency Communications Network, and Air Force and Navy survivable communications programs.

R&D on Computer System

Senator Thurmond. How much research and development remains on the computer system for which you are requesting procurement in FY 1973?

General Terry. On the computer itself, none. However, we have requested $1.7 million FY 1973 RDT&E on connecting these computers with other computers supporting the WWMCCS to improve the WWMCCS effectiveness and efficiency.

747 Aircraft

Senator Thurmond. How does this system relate to the Defense request for 747 aircraft?

General Terry. The 747 command aircraft will be used as one of the alternate command centers of the National Military Command System. Computers for the 747 are not part of the current WWMCCS computer procurement.

Senator Thurmond. Were these essentially software computers and, if so, what test requirements had to be met to justify procurement?

General Terry. The IBM and CDC computers are essentially software computers and were obtained in accordance with standard DoD policies for acquisition of ADP equipment. They were chosen primarily because of their ability to operate with existing software thus avoiding the time and cost of having new software produced. With respect to acceptance, they had to meet the acceptance test criteria in the standard GSA Federal Supply contracts.

Computers Ages

Senator Thurmond. What is the age of the National Military Command System Computers which would be replaced in FY 1973 and FY 1974?

General Terry. At the time of replacement, the IBM computer in the NMCSSC will be 5½ years old and the two IBM computers in the ANMCC will be 6 years old. In anticipation of the buy of standard equipment and expected discount because of the size of the buy this equipment is leased and not government owned. These computers will be transferred to the U.S. Marine Corps for its use and the government equity through the lease with option to buy contract will be retained. The CDC computer in the NMCSSC was installed initially in 1962 and was upgraded with refurbished used components in 1969. The average age of this system considering all components will be approximately 8½ years old when replaced.

Annual Cost of Defense Communications System

Senator Thurmond. General Terry, provide tabulation setting out the estimated annual cost of Defense Communications System for Fiscal Years 1971, 1972 and 1973, Similar to the statement on page 595 of last year's hearings.

General Terry. I will do that.

(The information follows:)

ESTIMATED ANNUAL COST FOR OPERATION OF THE DEFENSE COMMUNICATIONS SYSTEM

[In millions of dollars]

	Fiscal year 1971	Fiscal year 1972	Fiscal year 1973
Army:			
Research and development	5.4	9.2	10.0
Investment	27.7	17.9	25.8
Operating	173.0	186.9	206.2
Military personnel	(63.2)	(68.3)	(65.1)
Total Army	206.1	214.0	242.0
Navy:			
Investment	15.9	3.0	11.3
Operating	73.6	79.3	80.4
Military personnel	(17.6)	(20.1)	(20.1)
Total Navy	89.5	82.3	91.7
Air Force:			
Research and development	12.5	4.7	5.2
Investment	37.7	4.5	13.6
Operating	181.9	195.9	210.6
Military personnel	(43.5)	(47.7)	(58.3)
Total Air Force	232.1	205.1	229.4
Defense Communications Agency:			
Research and development	8.1	11.0	8.2
Investment	3.8	2.3	4.0
Operating	46.6	51.2	52.6
Military personnel	(15.5)	(16.6)	(16.7)
Total Defense communications system	58.5	64.5	64.8
Other Defense agencies:			
Operating	8.8	10.1	10.7
Military personnel	(.4)	(.3)	(.3)
Total other Defense agencies	8.8	10.1	10.7
Summary:			
Research and development	26.0	24.9	23.4
Investment	85.0	27.6	54.7
Operating	483.9	523.4	560.5)
Military personnel	(140.2)	(153.0)	(160.5)
Total Defense communications system	594.9	575.9	638.6

Cost of DOD Telecommunications System

Senator Thurmond. Provide a tabulation by appropriation category, by agency, and by responsibility of total funds requested in the fiscal year 1973 Department of Defense budget for telecommunications programs similar to the tabulation on page 597 of last year's hearings.

General Terry. The total cost (TOA) for telecommunications programs in the FY 1973 budget request is estimated at $2,393 million. This estimate excludes telecommunications which are integral to weapons systems and are designed and procured as components of such systems. The estimate does not include the operating cost of communications units organic to combat organizations such as Army division and Navy ships. Restructuring of the Five Year Defense Program to provide better visibility of telecommunications has produced significant changes during the past year. For example, military personnel costs of approximately $180 million not previously identified as part of the telecommunication programs have recently been identified as such and are included for the first time in the table below. The refinement is continuing. The $2.393 million, which includes the cost of the January 1972 pay increases, is distributed as follows:

	Millions
1. By appropriation category:	
R.D.T. & E	$254
Procurement	343
Military construction	17
O. & M	955
Military personnel	824
Total	2,393
2. By agency:	
Army	798
Navy	557
Air Force	878
DCA	68
Other defense agencies	92
Total	2,393
3. By telecommunications category:	
General communications	1,218
Post and base	236
Tactical	452
COMSEC	130
Intelligence	97
Command and control	260
Total	2,393

SUBCOMMITTEE RECESS

Chairman ELLENDER. The subcommittee will stand in recess until 10 o'clock tomorrow morning and reconvene in room 1224 in the New Senate Office Building.

(Whereupon, at 12:35 p.m., Thursday, March 23, the subcommittee was recessed to reconvene at 10 a.m., Friday, March 24.)

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DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

FRIDAY, MARCH 24, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 10 a.m., in room 1224, New Senate Office Building, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

DEPARTMENT OF DEFENSE

NONDEPARTMENTAL WITNESSES

STATEMENT OF HON. JOSEPH S. CLARK, CHAIRMAN, COALITION ON NATIONAL PRIORITIES AND MILITARY POLICY

BUDGET REQUESTS

Chairman ELLENDER. The subcommittee will please come to order.

This morning, we will conclude the hearings on the regular budget requests to be considered by the Department of Defense Subcommittee for inclusion in the Department of Defense appropriation bill for fiscal year 1973. These requests total $76.7 billion.

I do not recall that the subcommittee has ever before progressed to this extent at this date in its consideration of the bill. I intend to make every effort to have this bill enacted by June 30, 1972. I am convinced that the timely enactment of this bill will save the taxpayers a considerable sum of money.

We have eight witnesses scheduled for this morning. We do not desire to impose a specific time limitation on any witnesses; however, it will be appreciated if the witnesses will cooperate with the committee by summarizing their presentations where possible.

The first witness we have for this morning is a former colleague and good friend, Senator Clark.

Senator CLARK. Thank you.

Chairman ELLENDER. You may proceed.

PREPARED STATEMENT

Senator CLARK. Thank you, Mr. Chairman. I deeply appreciate the opportunity to appear before you in your capacity as chairman of the subcommittee on the defense budget. Since I did appear before you about six weeks ago, when you held hearings in your capacity as chair-

man of the entire Appropriations Committee on this same general subject, I think I can make my testimony this morning relatively brief. I would appreciate it, however, if you would permit me to submit for the record the prepared statement and the annexes to it so I won't have to go over it.

Chairman ELLENDER. The entire statement will be put in the record at this point, with the annexes as exhibits. You may proceed to highlight it.

(The statement and exhibits follow:)

STATEMENT OF HON. JOSEPH S. CLARK, CHAIRMAN OF THE COALITION ON NATIONAL PRIORITIES AND MILITARY POLICY

Mr. Chairman and members of the committee, the Coalition on National Priorities and Military Policy, of which I am Chairman, is happy to respond to your invitation to present our views on the Department of Defense appropriations for fiscal year 1973. We hope, and we believe, that we can contribute toward a clearer understanding of the nation's security needs and priorities. The Coalition consists of 39 business, labor, scientific, religious and peace groups who have come together to support four objectives:

1. To oppose wasteful military programs.
2. To encourage arms control and disarmament.
3. To redirect resources to meet human needs at home and abroad.
4. To seek enactment of measures for conversion to a peace time economy.

Attached to this statement is a list of the members of the Coalition, its Board of Directors and officers.

Contributions to the Coalition are not tax-exempt. It finances itself by annual contributions from its member organizations, by direct mail solicitation and by special gifts made by interested individuals.

Mr. Chairman, we commend you for seeking testimony from non-governmental organizations. We believe that our democratic processes are guaranteed when citizens participate in the decisions made by our government, especially in the areas of national security and federal spending priorities.

We are particularly grateful to you for initiating the precedent-setting hearings by the full Appropriations Committee on the questions of national goals and priorities, February 1st through 5th of this year. These hearings were truly remarkable. We are encouraged by your growing commitment to come to grips with the pressing demands for reordering our national spending priorities.

During your hearings on national priorities, most of the witnesses emphasized that vast amounts of money must be appropriated to meet urgent human needs at home and abroad. Many of these same witnesses stated that the military budget contains items totalling billions of dollars representing military waste, obsolete and unnecessary military expenditures which could be eliminated without threat to our national security.

At that time, I referred to *Counterbudget* a study prepared last year by the National Urban Coalition and signed by and impressive panel of America's leading citizens. This study indicated that cuts in the military budget of $16 billion could be made without prejudice to our national security. The money saved in this way could be redirected in fulfillment of six national goals summarized in *Counterbudget* as follows:

1. Full employment and reasonable price stability.
2. Equal opportunity for all Americans.
3. A floor below the misery of all Americans, i.e. adequate food, shelter, health care, environmental, personal safety, and an adequate income.
4. Rectify the imbalance in revenues between federal and state and local governments.
5. Sufficient national security through the armed forces to protect our country against military offense from abroad.
6. Help to underdeveloped nations.

I hope the Senate Appropriations Committee will act to achieve these goals for our country.

Unfortunately, the President's budget for fiscal year 1973 clearly indicates that his Administration will fail to meet these goals. Instead, the President desires Congressional approval to drain our limited resources to feed an already bloated military monster. He has requested obligational authority for national defense

totalling $85.4 billion—a record breaking high for peacetime. In terms of 1973 dollars, baseline military costs (excluding the Indochina War) will be rising by an estimated $6 billion since fiscal year 1971.

The President has claimed that his Administration will spend less for national defense than for human resources and other purposes, that in fiscal year 1973, 32% of the budget dollar will be allocated to national defense, 45% for human resources and 10% for physical resources. But the Administration's claim is misleading. If we take into account all war related expenditures, such as veterans benefits, interest on the national debt, and certain portions of foreign economic aid, national defense would constitute 44% of the 1973 budget dollar compared to 39% for human resources and 10% for physical resources. Excluding the trust funds from budgetary calculations, the portion for national defense rises to 60%, compared to 19% for human resources and 11% for physical resources.

During the past few years, Mr. Chairman, you and your Committee have done an admirable job of exercising judicial restraint over defense appropriations. For fiscal year 1971 you cut the Presidents request of $71.6 billion for the Department of Defense by appropriating $69.2 billion. You cut another $2.8 billion from the fiscal year 1972 request of $73.3 billion. Your work has been appreciated by those of us who are working to create a better life for all Americans.

This year, the Nixon Administration is putting you to a rather severe test by asking for a monumental Department of Defense appropriation of $78.7 billion. In view of the Administration's disregard for the well being of our own citizens, you will be under much greater pressure to achieve a reordering of priorities. This is particularly evident when we take into account the projected federal funds deficit of $36.2 billion.

In light of the President's spectacular summitry, the Administration's military budget request appears contradictory. If the President's recent visit to the People's Republic of China and his forthcoming trip to the Soviet Union will actually improve the international climate, it would appear that the mammoth defense budget would be an impediment to better relations.

The budget is where rhetoric meets reality. Unfortunately, the reality of U.S. military posture indicated by the 1973 budget reflects a continuation of policy assumptions stemming from the Cold War period. The policy assumptions are:

1. The U.S. and other "Free World" nations are threatened by aggressive "Communist" powers.
2. The United States bears the primary responsibility for defending the "Free World" against "Communist" threats.
3. The "Communist" threat is military in nature and requires a military response.
4. More military expenditure equals more security.

These policy assumptions have cost the American taxpayer more than $1 trillion for military expenditures since 1946. These same assumptions have produced a vast network of commitments in the form of military alliances and military aid recipients. According to the Department of Defense, the U.S. maintains more than 2000 overseas installations of which 365 are considered major bases. This network is still expanding as indicated by current controversies over new Naval bases in Greece and the Indian Ocean. As of December 28, 1971, the U.S. was supporting nearly 700,000 U.S. troops on foreign soil, only about half of which were stationed in Asia.

The tragedy of all is the suffering our policies have caused. Our involvement in Vietnam will be regarded by future generations of Americans as a wasteful and devastating blunder. Our military support of ruthless dictators is suppressing indigenous aspirations akin to our own American Revolution. Our own brand of imperialism, Pax Americana, is sapping our society of its vitality and endangering our democratic way of life. The spirit of our people is being broken by feelings of despair and helplessness in the face of a seemingly uncontrollable military machine.

A major cause of this dilemma is the persistent practice of the Nixon Administration to sell its military spending schemes by manipulating public fears over inflated military threats. The Pentagon's "worst cast" philosophy is draining our national treasury with no apparent beneficial result. Instead, the taxpayer is burdened with the bill for overkill and overruns. Mr. Chairman, your own experiences in the Soviet Union seem to indicate that the Pentagon has created a "straw man."

The irresponsible behavior of the military brass no longer entitles them to be the sole judge of military policy; the American people are losing confidence

in the Pentagon claim of "expertise". Security issues are now matters of politics, and political judgments are the proper domain of the Congress. In the face of the outrageous request for military funds, the Appropriations Committee must exercise its own judgment about what constitutes "sufficiency" in military posture.

My point has been aptly illustrated by Herbert Scoville, Jr., former assistant director of the Arms Control and Disarmament Agency and deputy director of the CIA, in the March 25, 1972, issue of *The New Republic*. With your permission, Mr. Chairman, I submit this article for the record. Mr. Scoville says that "The Administration policy of 'sufficency' is only superiority in another cloak". He describes how the Pentagon has consistently overrated the Soviet threat and has proceeded to deploy strategic arms far in excess of any realistic security requirements.

I believe that the real threats to American society are not entirely military. Within a few years, the United States and, for that matter, all of mankind will be confronting very serious threats to security.

1. With the proliferation of nuclear warheads, the possibility of accidental or even intentional nuclear holocaust becomes much greater. At the present time, it is doubtful that the President and the Congress have sufficient control over the nuclear arsenal to prevent the launching of missiles from every submarine and land sites. With the continuing deployment of MIRV and the development of other strategic weapons systems, the risks will probably escalate.

2. The accelerating growth of world population, if continued, may absorb the output of world food production capability within the next century.

3. Increasing industrial production is rapidly depleting non-renewable resources.

4. Pollution will become more serious as industrial production, food production, and population increase.

The most disturbing characteristic about all of these threats—nuclear, population, industrial growth and pollution—is that their severity is increasing. As a result, the costs of solving these problems will rise as well. This crisis of priorities will not be served by a gradual shifting of resources from the military to human survival needs. Rather, we must abandon our futile quest for military supremacy and undertake bold initiatives to work with other major powers to meet the real threats to world survival. If the United States were to invest adequate resources in this way at this time, the demands on the federal budget could easily absorb much of the funds now allocated for military purposes. Unless a new course is undertaken immediately, future generations may not be able to respond to the impending crises in time.

It would be unrealistic to expect these far reaching changes to be enacted this fiscal year. But important steps can be made in the short run. The Appropriations Committee can begin to consider present military legislation in terms of the future national security needs I have discussed. The highest priority should be given to carefully examining the assumptions upon which the Administration has based its military policies and its budget requests.

1. If our present network of military commitments is based on an outmoded view of the United States military role in the world, the following provisions in the Administration's request should be re-evaluated:

(*a*) Indochina War. The policy of the United States Government as determined in the last session of Congress is to terminate United States involvement in hostilities in Indochina. This policy should be implemented by making significant reductions in funding for United States operations in Indochina and curtailing aid to Asian governments.

(*b*) Automated Warfare. The only rationale for developing an automated warfare capability of the sort being used now in Indochina is future involvement in other local guerilla wars. If we resolve to cut back our commitments to oppressive regimes in Asia, Africa and Latin America, we should not continue to develop the military capability to support these commitments.

(*c*) Manpower. Since most of the military manpower is allocated to overseas contingencies, a reduction of commitments should alleviate the need of large active duty forces. Overseas troops could be withdrawn gradually, the draft could be terminated and total manpower could be reduced to a figure below 2,000,000 average strength.

(*d*) Weapons Programs. Certain weapons programs requested as necessary to maintain commitments could be terminated or reduced substantially, e.g., the proposed carrier and the F–14, F–15 and close support aircraft programs. Although the new carrier is often rationalized in terms of the so-called "Soviet

threat" its most viable application is to intimidate indigenous movements. We are being asked to pay for an exorbitant program to rebuild a fleet which will have limited effectiveness in the missile age. The Administration's statement that, "Naval forces insure our ability to protect vital shipping lanes," sounds like a rehash of Admiral Mahan.

2. Considering the proliferation of nuclear arms, steps should be taken to reduce excessive military power. The so-called triad system of strategic nuclear weaponry is wasteful and not vital to our national security. The Minuteman and Titan land-based intercontinental ballistic missiles are becoming more vulnerable to Soviet attack and cannot be protected by ABM's which are unlikely to perform their defensive mission under battle conditions. Plans to build the B–1 bomber should be abandoned. For practical purposes, the B–52 inventory has sufficient life expectancy with relatively inexpensive modification. Only the Polaris and Poseidon submarines are invulnerable to Soviet or Chinese attacks. Therefore, the ULMS is definitely not needed at this time. Until such time as an arms control and disarmament agreement can be negotiated, we should concentrate on keeping our present submarine deterrant in a high state of readiness and eliminate other elements of the triad when they become obsolete. It is no answer to say that this will cause the Air Force and the Army to lose face. More urgent priorities at home cannot permit such wasteful military expenditures to gratify the ambitions of a few generals. Continued deployment of MIRV is a growing aggravation to the Soviets and should be ceased immediately.

I have not attempted to put a dollar value on each of the proposed cuts I have discussed. It would not be difficult to imagine a savings of several billions of dollars.

There is an able study of the DOD budget which the committee should carefully consider. It was prepared by competent experts for your colleague Senator George McGovern. The technique is interesting and sound. Instead of building the '73 budget on the basis of existing expenditures, it starts from scratch to determine just what military expenditures are required for fiscal '73 to protect the national security. In short, it starts from a zero base. The result is a recommendation to cut the budget to $54.8 billion dollars estimated in 1975 dollars. This figure compares with the administration recommendation of $76.5 billion, or if authority to spend in future years is included, of $83.4 billion. The latter figure is an increase of $6.3 billion over the request for fiscal '72 and cannot possibly be justified. We urge the committee to give careful consideration to Senator McGovern's recommendations.

When I say that the American public desires a shift in spending priorities, I am supported by the opinion polls. During the Coalition's recent Citizens' Hearings on National Security, Bruce M. Russett, Professor of PoliticalScience at Yale University, cited the evidence. From the late 1930's until 1960, the portion of the population wishing to reduce military spending never exceeded 35% and usually totalled less than 20%. Since 1968 there has been a revolutionary change. Approximately half of the over-21 population has been ready to reduce military expenditures, and it is among the highly educated that this sentiment runs strongest. According to Russett, "Advocates of greater military exertions will find themselves hard-pressed to make defense spending politically defensible."

I close with warnings to the American people uttered by two great military figures nearly twenty years ago. The first by General Douglas McArthur on May 15, 1952, before a Joint Session of the Michigan State Legislature.

"Indeed it is part of the general pattern of misguided policy that our country is not (and the 'not' should be 'now') geared to an arms economy which was bred in an artificially induced psychosis of war hysteria and nurtured upon an incessant propaganda of fear. While such an economy may produce a sense of seeming prosperity for the moment, it rests on an illusionary foundation of complete unreliability and renders among our political leaders almost a greater fear of peace than is their fear of war."

The second of President Dwight D. Eisenhower on April 16, 1953.

"Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone. It is spending the sweat of its labourers, the genius of its scientists, the hopes of its children. The cost of one modern heavy bomber is this: a modern brick school in more than 30 cities. It is two electric power plants, each serving a town of 60,000 population. It is two fine, fully equipped hospitals. It is some 50 miles of concrete

highway. We pay for a single fighter plane with a half-million bushels of wheat. We pay for a single destroyer with new homes that could have housed more than 8,000 people. This, I repeat, is the best way of life to be found on the road the world has been taking. This is not a way of life at all, in any true sense. Under the cloud of threatening war, it is humanity hanging from a cross of iron."

The Appropriations Committee has an obligation to the American people to do more in fiscal year 1973 to make funds available for the compelling needs of our society. You have the power of the purse. You are the ultimate arbitrator of national priorities. Your performance can be easily evaluated in the simple terms of dollars and cents. During the Nixon Administration "the buck stops here."

The ultimate security of our American civilization demands no less.

"Sufficiency is Superiority in Another Cloak"—Laird's Latest Alarms

"The Soviet Union is continuing to create strategic capabilities beyond a level which, by any reasonable standards, already seems sufficient." So said President Nixon in his State of the World message on February 9. The point can be conceded. The Soviets have strategic forces well beyond those needed to deter a U.S. attack, even if our strategic arsenals continue to increase at a high rate.

But what President Nixon's message did not say is that the US is also building forces greater than needed to deter a Soviet attack and prevent us or our allies from being coerced. The administration policy of "sufficiency" is only superiority in another cloak.

We are now placing MIRVs (multiple warheads which can be aimed at individual targets) on a large fraction of our land- and seabased ballistic missiles. Secretary Laird reports that during the past year we added warheads to our missile force at the rate of almost three a day. MIRV deployment as an alternative to building more missile launchers has long had strong support by the Joint Chiefs of Staff, and most of those who are now leading the hue and cry about Russian superiority in missile launchers are ignoring this warhead expansion. Our total offensive force loadings will, according to Secretary Laird, increase between mid-1971 and mid-1972 from 4700 to 5700 weapons while, during the same period, the Russians will only add 400 new weapons to their stockpile of 2100. At this rate, it will be a long time before they catch up.

All elements of our strategic forces are being improved far beyond the requirements of "sufficiency." We are deploring a new generation of missiles in both our land- and seabased launchers when no current threat requires them. We are planning to build still more advanced missile submarines (ULMS) before there is any conceivable danger to the existing ones. We are building a new bomber, the B–1, years before the B–52s will become obsolete. We are deploying an ABM defense of Minuteman missiles which is not needed to preserve our deterrent, and is, moreover, inadequate and poorly designed to protect these missiles if the Soviets do develop a MIRVed ICBM force.

Over and over again, Secretary Laird and other Defense officials have stressed the *momentum* of the Soviet strategic build-up as justification for these additional weapons on the part of the US. On January 25, Laird prefaced his request for supplemental appropriations in this fiscal year with the statement: "These funds will be used for programs that we need to start now to meet defense requirements as a result of the Soviet weapons momentum."

What is this "momentum"? In his Annual Report of February 15, Laird described the Soviet strategic weapons developments which presumably worry him the most. The following item by item analysis of all of these leaves some doubt as to whether his concern is warranted.

Continued Deployment of ICBMs

The increase in Soviet landbased ICBMs has in the past always been cited as the dominating element in the threat. The Russians now have 1520 ICBM launchers as compared to 1054 US launchers. Though some 100 new Soviet silos have been identified for new or modified ICBM systems, the build-up has been slowing down. Indeed, Mr. Nixon in his State of the World message noted that the USSR added only 80 ICBMs last year, compared to 256 the previous year. Secretary Laird now projects an increase of only 30 between November 1, 1971 and mid-1972, and points out that the SS–9, SS–11 and SS–13 programs may be over. So the "momentum" in total numbers of Soviet ICBM launchers seems to be petering out.

What about the large ICBMs—the SS–9s which were most feared as potential first strike threats to our Minuteman deterrent? Here, the pace has slowed even more dramatically. In August, 1969, the Soviets were reported to have more than 275 SS–9s operational or under construction, and Secretary Laird predicted an increase of 50 or more per year in then justifying the need for the Safeguard ABM. Now, two-and-a-half years later, he reports that there are only about 300 of these large type ICBMs operational or under construction—hardly a cause for new alarm this year or requiring major increases in funds for new US strategic weapon systems. Included in this Soviet total are the same 30 new large launchers that were first reported under construction a year ago. No new Soviet missile has been tested for these launchers even a year later, and even if a new missile were to be deployed in them, it would not signify any increase in previously estimated threats we've always assumed. The SS–9 is capable of launching any MIRV system the Soviets chose to develop. If they need a different missile to have a MIRV to threaten Minuteman, then our previous worries were greatly exaggerated. It is rumored that the Russians may accept a ceiling on large missiles at SALT (Strategic Arms Limitations Talks). If so, that would publicly commit them to *halt a program they have almost stopped unilaterally.*

Secretary Laird also refers to extensive testing since 1965 of a modification of the SS–9 which would permit it to be fired on a depressed trajectory or used as a fractional orbit bombardment system (FOBS). This was mentioned years ago by Secretary McNamara and is not provocation for increased concern today. Such a system would be less effective than the basic SS–9 in destroying our Minuteman missiles.

MIRV'S

The Russian MIRV program is now behind where it was said to be in 1969 by the administration. At that time, Mr. Nixon and defense officials reported that the Soviets had beeen testing a multiple reentry vehicle system which had a "footprint" that appeared to threaten our Minutemen silos. Now Secretary Laird states that, "while the Soviets probably have not tested MIRV missiles thus far, they have conducted many tests of the SS–9 with multiple reentry vehicles (MRVs) since flight testing began in August 1968. The last MRV tests were in late 1970." What kind of "momentum" is this? The testing of a MRV on the small SS–11 ICBM, or even the deployment of MRVs as recently reported by Laird, subsequent to his report to Congress, calls for no panic. All authorities have conceded that MRVs, whether on the SS–9s or SS–11s, do not endanger our Minuteman. Cries of alarm for three years cannot alter the fact that there is no present evidence that the Soviets have started a MIRV program.

The President correctly states that the Russians have the basic technological ability to develop MIRVs, and this can be the only explanation for Secretary Laird's prediction that the "Soviet MIRV capability could be achieved next year." But there is no factual evidence to support such an estimate since testing has not begun. It would appear that Laird's prediction is even less valid and even more misleading than those made in 1969. For although the Soviets could begin testing at any time, it would almost certainly be more than three years before they could deploy any system that could even marginally threaten Minuteman. With the limited number of large missiles that will be available to the Soviets in the near future, such a MIRV system would have to disperse accurately six or more warheads per missile. This is within the payload capability of the SS–9, but a very long time would be required before it could be developed, tested, and deployed in significant quantities.

SUBMARINE MISSILES

The Soviets have during the last three years been building up their submarine ballistic missile force. They have 25 operational Y-class submarines, each with 16 missiles; they are turning out additional submarines at the rate of 9 to 10 a year as compared with the eight a year estimated earlier. When all those now under construction are completed, however, they will only have achieved approximate numerical parity with the U.S. They will still be below the total Western forces, since the French and the British also have small missile submarine fleets. More important, President Nixon recently said that "our missiles have longer range and are being equipped with multiple independently targetable warheads. Moreover, our submarines are now superior in quality." This year, as last year, authorities have referred to a new long-range Soviet submarine missile, but it has been reported that this missile could not be fired from the Y-class submarines unless these are modified.

Since missile submarines are primarily deterrent weapons and cannot be used to attack either the Minuteman or Polaris portions of the US deterrent, it is hard to see how this Russian build-up would justify adding to US strategic forces. Our submarine strategic forces are "highly survivable," says Mr. Laird, and while there are indications that the Soviets are attempting to establish an area surveillance system and associated ASW (anti-submarine warfare) strike forces, they do not as yet have this capability. Other officials have testified that they have not been able to identify any developments that indicate a Soviet threat to our seabased missile deterrent.

None of the reported Soviet weapons programs require the construction on a crash basis of a new submarine missile system (ULMS), which may cost tens of billions of dollars and may be designed to cope with the wrong threat. This is not security; it is insanity.

STRATEGIC BOMBERS

Both the President and Secretary Laird have warned of a new Soviet supersonic bomber. What they have in mind is a medium-range aircraft, probably primarily designed for use in Eurasian situations and of little direct threat to the continental US. Laird reports "a probability that it has a capability for in-flight refueling. With refueling it could reach virtually all US targets." He does not say whether these bombers could ever get back to Russia, if they were used against such targets. Again, the development of this type of Soviet bomber, about which we have known for several years, does not require expanded US programs in response. We now have an overwhelming quantitative and qualitative lead in strategic bombers.

ABM'S

Laird also reports that "construction of the Moscow ABM system has resumed and testing of an improved ABM missile continues." He referred to this resumption last year and to the testing back in 1969. Nevertheless, Admiral Moorer, Chairman of the Joint Chiefs of Staff, has just said that the Moscow system, even with improved radars and more and better interceptors, could still be saturated by a very small part of our total missile force. It does not, therefore, endanger our deterrent. The US has apparently been seeking at SALT, ABM limitations at levels *greater* than the present Moscow system, so it is hard to believe that the administration is really worried about the Moscow ABMs. Furthermore, the Soviets have been eager for an agreement to limit ABMs, and President Nixon has expressed optimism that this can be achieved at an early date, so the long-term danger from ABMs may never develop. If the SALT negotiations break down, the Soviet ABM program still does not warrant increases in US strategic force levels for many years. We have ample lead time to put into effect any necessary countermeasures.

The deployment of a widespread space tracking system that would enable the Russians to predict the position of near-earth orbit satellites is described by Secretary Laird as a Soviet research and development effort worth mention. Presumably this system is composed of the same surveillance radars that a year ago he sought to associate with a Soviet ABM system. Apparently, the association is no longer considered quite so valid, and the fears generated in some quarters in past years are no longer as great. A space tracking system is not a major security threat; the US has had one for more than 10 years.

In sum, in its current round of budget requests the administration has been crying wolf: it has not come forth with a single new development in the last year that in any way demonstrates a new threat to our strategic deterrent. The Soviet ICBM program is winding down and its MIRV program is many years behind original predictions. Only in the area of submarine missile deterrent systems has the Soviet program continued to roll forward, and here the US is more than one generation ahead. The Russian strategic weapons programs are continuing, but their momentum is faltering.

In contrast, we have been moving forward with increasing speed on all fronts. We are deploying MIRVs rapidly so as to increase our force loadings at the rate of 1000 warheads per year. We are developing new guidance systems for these MIRVs. We are deploying a new model ICBM, Minuteman III, and modifying our submarines to fire the new Poseidon missile with a payload four times as large as the Polaris. We are not building any additional missile launchers, but no one has seriously advocated our increasing these for many years. We

have a far more extensive anti-submarine warfare program both in terms of deployment and in terms of research and development than the Soviet Union. We are proposing to commit large sums to a new missile submarine (ULMS), though our present system is far superior to the Soviet Union's. We are building a new intercontinental bomber. We are proceeding with an expanded ABM deployment and carrying out extensive research and development on next generation systems. Restraint in US weapons programs is hard to find. The administration ought to drop the double standard by which it evaluates US and Soviet strategic weapons.

Member organizations

American Baptist Convention, Division of Christian Social Concern
American Ethical Union
American Friends Service Committee
American Humanist Association
Americans for Democratic Action
Anti-Pollution League
Business Executives Move for Vietnam Peace and New National Priorities
Christian Church (Disciples of Christ), Department of Church in Society
Committee for Community Affairs
Church of the Brethren
Executive Council of the Episcopal Church
Federation of American Scientists
Friends Committee on National Legislation
Fund for New Priorities in America
International Union, United Automobile, Aerospace & Agricultural Implement Workers of America—UAW
Mennonite Central Committee
National Coalition of American Nuns
National Council of Churches, Department of International Affairs
National Education Association
National Federation of Temple Sisterhoods
National Student Lobby
New Democrataic Coalition
Presbyterian Church in the U.S., Office of Church and Society
SANE
Society for Social Responsibility in Science
Southern Christian Leadership Conference
Task Force for the Nuclear Test Ban
Union of American Hebrew Congregations
Unitarian Universalist Association
United Church of Christ, Council of Christian Social Action
United Methodist Church, Board of Christian Social Concerns
United Presbyterian Church, USA, Department of Church and Society
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Herman Will, Jr., United Methodist Church, Board of Christian Social Concerns

FUNDING OF DOMESTIC PROGRAMS

Senator CLARK. The Senator appreciates that the Coalition on National Priorities and Military Policy, of which I have the honor to be chairman, with a background concerning which appears in an attachment to my prepared statement, is vitally interested in seeing that domestic programs are properly funded. We think one reason they have not been in the past, probably the principal reason, is because of the extortion demands of the DOD and the military for what we believe to be quite unnecessary expenditures in the area of defense.

These urgent human needs at home will have to be funded by the Appropriations Committee—not the Subcommittee on Defense, of course—but all of these other requests will come before you, sir, and you will bear in mind, I am sure, our position that in order to get the money to feed hungry children, to deal with air and water pollution, to give adequate sums also for education, it has to come from somewhere and, since we have put through, I believe—and I suspect you believe, sir—quite an improvident tax cut, running up the Federal deficit many, many additional billions of dollars, the most likely place to find part of the money for domestic programs is in the area of unnecessary defense spending.

Therefore, this statement attempts to direct yours and the subcommittee's attention to specific areas where we think you should make considerable reductions in the Nixon administration's request. I have become almost tired, sir, in calling to your attention the National Coalition's budget which came out about a year ago and contains a most interesting table on page 274, which I called to you and your staff's attention, showing that these essentially conservative businessmen and civic leaders believed last year that the budget could have been cut to the tune of $16 billion without any adverse impact on our national security. We adopt their recommendations as our own and urge the committee and its staff to give this study very careful attention.

Chairman ELLENDER. Senator Clark, I am sure you know that in the past 2 or 3 years the Congress provided pay raises for military personnel. As a matter of fact, the military and civilian manpower cost to the Government requires 56 percent of the budget.

Senator CLARK. I figured 60.

Chairman ELLENDER. Well, the magnitude is obvious, anyway. It is my personal belief that what must be done is to find some means of reducing the number of personnel who are serving in the military services—that is, the so-called people who back up the combat personnel.

We found out a couple of weeks ago that of the 2½ million military personnel in the combined services, only 22 percent do the actual fighting and the others are in support roles. I am giving quite a great deal of attention to this phase of the program to see if we can't cut back on manpower.

As for as I am personally concerned—and I am sure you feel the same way—we should be second to none in trying to provide security for our country. I am for it. But I am going to do it at the least cost.

Senator CLARK. We thoroughly agree with you, sir. Our recommendation is that the manpower ceiling should be dropped from the present 2.5 million, which, under the new budget would go down to 2.3 million. We believe it could go down to 2 million without any serious impact on national security.

I point out to you also: With this, should go a corresponding reduction in number of civilian personnel who support the soldiers, none of whom are engaged in combat activity.

TRIMMING THE ARMED FORCES

So, if you take the concept there are about 1 million civilian employees serving the armed forces now and if you cut 200,000 off of them, you would have a total savings of half a million in the number of people paid for who are on the Defense Department budget directly or indirectly. This, we are confident—and we spell it out in our statement—can be done without any impact on our national security.

Chairman ELLENDER. That is an area I think the committee will look into closely. I have already taken steps to find some means of curtailing the number of personnel without in any manner affecting our security.

Senator CLARK. We are delighted that the chairman takes that point of view.

I would point out to you, too, sir, another argument I think is worth considering. Everybody is now saying we have to get rid of the draft, we don't need conscription any more, but the concept has been in order to do it you have to make enormous increases in pay of those in the Army now.

I submit to you with the current rate of unemployment this is not necessarily true. There are probably plenty of men who would go into the Army in order to get a job without the necessity of giving a huge pay increase, and there is another potential savings of a considerable number, hundreds of millions of dollars.

This year, the Nixon Administration is putting this committee through a severe test by the enormous amount of money they are requesting for the defense budget. Yes, Senator Young, you have to think about the demands for domestic programs which you have to fund on the Appropriations Committee. I suggested to Senator Ellender the best place to find the money is to take it away from unnecessary expenditures.

So the big question is: Are they necessary or not? We contend—and I try to document it in the statement—that there are at least $16 billion of unnecessary military expenditures contained in this budget. They are set forth in the document "Counterbudget," which was approved by some of the most conservative and yet some of the ablest American citizens, people like David Rockefeller; Andrew Hyskul (phonetic), president of General Motors; Mr. Roach; a whole group of them who put their premature approval on this cut and spelled it out in detail.

We are not going to try to discuss the detail in it, because it is all in here. I urge you to get your staff to take a good look at it and see if there is not a lot of common sense to it.

Mr. Chairman, to skip a good deal, this year the Nixon Administration is putting you to a rather severe test with this huge request, and you are under greater pressure than ever to achieve a reordering of priorities, and this is particularly true, as I said a minute or two ago, because of the huge Federal deficit which is projected into this budget and is sure to cause increasing inflation, further weakening of the dollar, and an inability to fund the domestic programs which are becoming really quite critical.

Now to turn to areas of specific potential savings, I would like to suggest reading the article which is attached to my statement written by Herbert Scoville, Jr., extremely competent former assistant director of the Arms Control and Disarmament Agency and now Deputy Director of CIA. This article, in effect, says: The administration policy of sufficiency, in terms of nuclear weaponry, is only a screen for superiority under another cloak. He describes in detail—and I won't take time to tell you now—how the Pentagon has consistently overrated the Soviet threat and proceeded to deploy strategic weapons far in excess of any realistic security requirements.

SOVIET FREEZE ON MISSILE SILOS

I recommend to you gentlemen the article in this morning's Washington Post entitled "Soviet Freeze Reported on Missile Silos," which brings to light for the first time that the Soviets are not building up an enormous additional number of MIRV intercontinental ballistic missiles, as Secretary Laird has told us time after time. The latest intelligence is, they are doing no such thing.

I would like to have placed in the record as part of my statement this article in this morning's Washington Post, starting on page 1, entitled "Soviet Freeze Reported on Missile Silos," which, I think, is again a situation where the Pentagon has been crying wolf when there is not any wolf. So therefore, by building up our defenses to an extent quite unnecessary in the light of a realistic appraisal of the Soviet threat, we have this situation.

Chairman ELLENDER. Without objection, the article will be printed in the record at this point.

(The article follows:)

[From the Washington Post, Mar. 24, 1972]

SOVIET FREEZE REPORTED ON MISSILE SILOS

(By Michael Getler, Washington Post Staff Writer)

No construction work has been started on any more large new underground missile silos in the Soviet Union for approximately the last six months, according to U.S. officials.

This development, which has been cautiously watched by U.S. intelligence, is viewed by a growing number of defense planners as a probable sign that the Soviets will agree to a nuclear arms limitation pact which puts a freeze on such construction in the future.

The Soviets began building the new types of protective shelters for their long-range ICBMs late in 1970. The move, detected by U.S. reconnaisance satellites in early 1971, set off considerable alarm of the Pentagon.

The dimensions of the new silos were larger than any that had been built before and appeared to be meant to house new or modified missiles even bigger than the huge Soviet SS-9 ICBM, some 290 of which are in place.

Between 1970 and late last summer, the Soviets began digging 90 to 100 of these big new holes. But officials say that no further increase has taken place since then, possibly in response to strong U.S. statements that agreement of any kind at the strategic arms limitations talks (SALT) would be virtually impossible if the Soviets continued to build more silos.

The Soviets did begin to make what officials describe as preliminary construction surveys for more silos at other locations last fall, but this work appears to have been curtailed, informants report.

While work continues on the 90-plus sites started earlier, a leveling off in the total number of places where new land-based missiles can be stored eases the oft-stated Pentagon concern over whether the Soviets can muster enough missiles of sufficient power and accuracy to wipe out the 1,000 U.S. Minuteman ICBMs also buried in underground concrete and steel shelters.

In 1969, during the heated debate over whether to build the Safeguard antiballistic missile (ABM) network, the Pentagon maintained that a Soviet force of some 420 SS–9 missiles, each armed with three nuclear warheads that could seek out and destroy three separate Minuteman silos, could wipe out all but a handful of the U.S. ICBMs in a surprise attack.

Since then, however, the SS–9 buildup, according to Defense Secretary Melvin R. Laird, has apparently ended. Adm. Thomas H. Moorer, Chairman of the Joint Chiefs of Staff, has confirmed what had been suspected for some time—that the Soviets have not yet been able to develop three-part warheads for the SS–9 accurate enough to knock out three separate Minuteman targets. Dr. John S. Foster, the Pentagon's research chief, this week said the Soviets "may have cancelled or curtailed" the triple-warhead project for the SS–9.

Thus, major Pentagon concern focuses on the big new silos. An apparent leveling off in their number could appreciably change the nuclear arithmetic, insuring that neither the Soviets nor the Americans can threaten to obliterate each other's land-based nuclear deterrent.

Of the roughly 90 or so new silos under construction, only about 30 are believed to be for newer SS–9-style missiles, which could carry accurate multiple warheads.

Some of the holes are for command posts rather than missiles.

The other 60 or so silos are believed to be for a new, somewhat smaller missile, or perhaps a modified version of the Minuteman-sized SS–11.

Even if this new weapon also carries accurate multiple warheads, the total of the existing SS–9s, plus the new missiles, would still be far below the number of warheads the Pentagon estimated in 1969 was needed to destroy the Minuteman system.

Both Foster and Moorer conceded that estimates of the future Soviet ICBM threat now vary widely, and that an actual threat to Minuteman, if it materializes, may not come until late in this decade or even the 1980s. They said that in the worst case, it could come by about 1975, however.

The "blackest" picture being painted in the Pentagon involves the emergence of two new types of Soviets missiles, able to carry accurate multiple warheads, which would be compatible not only with the new silos, but with the older ones, too, and able to be used as replacement missiles.

So far, no new missiles have been installed in the new silos, nor have any been tested, although the Pentagon continues to expect such tests.

Alternatively, the Russians might try to put a new type of accurate multiple warhead on the older SS–9s and increase the accuracy and nuclear charge on the much smaller and currently less threatening SS–11. Those prospects, however, are also viewed as long shots.

POSSIBLE BUDGET CUTS

Senator CLARK. I point out, sir, you are passing on a budget which will not be effective until July 1973. It would seem to me that the committee might well take the President at his word that he is going to get out of Indochina in the foreseeable future even though not willing to set a specific date.

I would suggest there be no money appropriated for military activities in Vietnam after the first of July. I suggest that the power of purse should be exercised by the Congress; you should take Mr. Nixon

at his word and cut out of the budget all military—of course, not economic assistance—all military expenditures for the Armed Forces of the United States in the area of Indochina after the first of the year.

The budget is not set up so we ordinary citizens can tell how much it should be, but I am sure you are in a position to tell how much it should be, and I suggest you ask fairly searching questions and that this amount could be saved.

Chairman ELLENDER. What about the amount in the budget for military assistance in Vietnam?

Senator CLARK. That is what I suggest we save.

Chairman ELLENDER. That is for Vietnamese to maintain their own army so the Americans can get out.

Senator CLARK. But how about the money which goes to the American Air Force and all of the bases we still have there, and how about the fighting in Laos by the CIA army which we are funding, and how about the support of the Cambodian Government? All of these things I think, are susceptible to a careful check by your committee in an exercise of the power of the purse.

AUTOMATED WARFARE

The next area deals with automated warfare. Here, we have not been able to get our hands on the dollars because it is pretty cunningly concealed in the budget. What I am concerned about is the automatic warfare capability of the sort now being used in Indochina which is for future involvement in other guerrilla wars.

I hope we are not going to fund any more guerrilla wars and resolve to cut back our commitments to oppressed regimes in Asia, Latin America, and South America and not continue to support development of a military capability to support these types of commitments but rather concentrate on developing our capability to deter a nuclear holocaust.

And I discuss manpower in the statement, so I will skip over that; and the weapons program, we suggest, can be pretty significantly cut back.

Now, I understand you are going to have a couple of witnesses later from the Navy this morning, and I suggest you ask them searching questions as to why it is necessary to have another aircraft carrier. We already have, I believe, 12. Most military people believe that the aircraft carrier is obsolete because it is so vulnerable to submarines. Also, its principal purpose is to provide aircraft to support guerrilla warfare all over the world, and I think we ought to be out of that when we get out of Vietnam.

This would include not only the aircraft carrier, and we think we shall retire about four or five of the present aircraft carriers and get along with six or seven. You know the Soviet Union does not have any and made the decision they are vulnerable to submarine attack and they are of no use to them, and I suggest they are no longer of much use to us.

This would carry with it the F–14 and F–15 and other close support aircraft programs, because they are largely for the purpose of defending vulnerable aircraft carriers from attack from the air. It is true

they are very vulnerable to air attack but more vulnerable to submarine attack, so there is another area where we suggest the administration's statement that naval forces assure our ability to protect vital shipping lanes sounds like a rehash of Admiral Mahon.

If we need to do that, let us do it with destroyers; you don't need aircraft carriers. The destroyers could carry a few aircraft to go out and take a look around to see what is going on.

Last spring, before the subcommittee of the Foreign Relations Committee dealing with arms control and international institutions, which is chaired by Senator Muskie, there was a very serious and important hearing dealing with the need to maintain the so-called triad system of nuclear offense—that is, the strategic Air Force, which practically all of the witnesses said is completely obsolete, it could never deliver its bombs on target in view of the great antiaircraft capability of the Soviet Union and the potential for the aircraft coming under Soviet fighter aircraft attack, the land-based intercontinental ballistic missiles, mostly MIRV, which are also said by Mr. Laird to be very vulnerable to Soviet attack, and, finally, the Polaris and Poseidon submarines, which are invulnerable to attack for the foreseeable future; and suggestions were made by knowledgeable witnesses at the hearings—and I commend those hearings to your staff—that we could get two out of three of the triad without danger to national security because each one of the Poseidon submarines carries enough nuclear warheads to destroy any city of any size in Russia; 145 cities could be knocked out in short order if we were under a necessity for doing it just with submarines, and billions of dollars could be saved if we got rid of the obsolete ones and also got rid of the land-based intercontinental missiles, including the MIRV's. We don't need all of that overkill, and there is an area where a lot of money can be saved.

Senator McGovern has come out with an excellent study which I commend to you gentlemen and to your staff, prepared by some quite competent experts, contending that cuts in the military budget considerably in excess of what "Counterbudget" recommends can be made without any detriment to our national security, and all of this is without regard to what we are going to be able to do in SALT, if we are able to do anything, and I am pessimistic about getting anything from SALT.

So these recommendations we are making to you for military cuts are without regard to the hope that we will have a meaningful arms control agreement which would have, one hopes, a good deal of impact on the 1973 DOD budget.

B–1 BOMBER

I am almost through. The B–1 bomber, in our opinion, is a great waste of money. In the first place, you can't build a bomber now that can get through the Soviet offenses without nuclear conventional weapons, and the B–52 is a magnificent long-range bomber, as proved by the activity in Indochina. It is not obsolete, and small changes could make it good for another 5 to 10 years; and, to go now with the B–1 bomber or ULMS, the submarine deal, is very wasteful and will run, in the end, to billions of dollars, and we don't need it because we have the Polaris and Poseidon, and, with the capacity of antisubmarine warfare on the Russian side, and ours is almost negligible; it

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just doesn't work, so, therefore, we have a good degree of safety in terms of nuclear defense, if you want to call it that, by relying on the Poseidon and the Polaris, which are invulnerable, whereas the air- and land-based missiles are vulnerable.

I don't want to bore you, Senator Ellender, but I don't think Senator Young has been subjected to the imposing part of my statement, which is a statement that General Douglas MacArthur made 20 years ago, when he said:

> Indeed it is part of the general pattern of misguided policy that our country is not—

and the "not" should be "now"—

> geared to an arms economy which was bred in an artificially induced pychosis of war hysteria and nurtured upon an incessant propaganda of fear. While such an economy may produce a sense of seeming prosperity for the moment, it rests on an illusionary foundation of complete unreliability and renders among our political leaders almost a greater fear of peace than is their fear of war.

I discovered, to my chagrin, in the second line of that quote, the word should be "now" n-o-w and not "not" n-o-t.

I think the second matter might be of more interest to Senator Young, a quotation from President Eisenhower made in 1953, 19 years ago, in which he said:

> Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone. It is spending the sweat of labourers, the genius of its scientists, the hopes of its children. The cost of one modern heavy bomber is this: a modern brick school in more than 30 cities. It is two electric power plants, each serving a town of 60,000 population. It is two fine, fully equipped hospitals. It is some 50 miles of concrete highway. We pay for a single fighter plane with a half-million bushels of wheat. We pay for a single destroyer with new homes that could have housed more than 8,000 people. This, I repeat, is the best way of life to be found on the road the world has been taking. This is not a way of life at all, in any true sense. Under the cloud of threatening war, it is humanity hanging from a cross of iron.

POWER OF THE PURSE

Senator Clark. This Appropriations Committee, I suggest, gentlemen, has an obligation to the American people to do more in fiscal year 1973 to make funds available for the compelling needs of our society. You have the power of the purse. You are the ultimate arbiter of national priorities. Your performance can easily be evaluated in simple terms of dollars and cents. During the Nixon administration, the buck stops right at this semicircular table.

The ultimate security of our American civilization demands no less, and I have not the slightest doubt that you gentlemen are going to measure up to your responsibilities.

I thank you again for your courtesy in hearing me, and I appreciate very much the opportunity to testify before you.

Chairman Ellender. Thank you very much, Senator Clark.

Any questions?

Senator Young. No.

Chairman Ellender. Thank you very much.

STATEMENT OF HON. ROBERT W. PACKWOOD, U.S. SENATOR FROM OREGON

LETTER FROM SENATOR PACKWOOD

Our next witness is Mr. Edward J. Glenn, I understand Senator Packwood will introduce him.

Before we proceed, I wish to say that Senator Hatfield, who is a new member of the Senate Appropriations Committee, hoped to be here this morning to introduce Mr. Edward Glenn to the committee, but he had prior commitments in Oregon. He has provided me with a letter of introduction for Mr. Glenn and an expression of support for Mr. Glenn's position regarding Navy ship repair practices.

I will make Senator Hatfield's letter a part of the record at this point, together with an earlier letter dated Nov. 16, 1971.

(The letters follow:)

United States Senate
COMMITTEE ON APPROPRIATIONS
WASHINGTON, D.C. 20510

March 24, 1972

Dear Chairman Ellender:

Appearing before you today will be Mr. Edward Glenn, testifying in behalf of the Western Shipbuilding Council. Due to prior commitments of mine in Oregon, I am unable to be there to introduce him to the committee. I would appreciate it if you would make this letter part of the hearing record at the time Mr. Glenn testifies.

In addition to his duties on behalf of the Western Shipbuilding Council, I know him as an officer in one of Oregon's fine companies, Willamette Iron and Steel, an organization long among my state's leading business enterprises.

I also would like to set out a few thoughts of mine in support of the allocation of a realistic proportion of non-nuclear repair work between Navy and private ship repair yards.

In the past, the Navy has relied on an overall percentage breakdown between Navy and private yards in discussing the allocation between them. Because only a few large, private yards are equipped to handle nuclear repair, these private yards do very well, while most of the others barely get any repair work at all. I would like to see a breakdown of the nuclear and non-nuclear repair work to see what part of the non-nuclear work is allocated to private yards.

Last year, the House of Representatives added language in its report on the Defense Appropriations bill mentioning the need to allocate a realistic portion of repair work to the private yards. Unfortunately, no mention was made of the need to differentiate between nuclear and non-nuclear repair. I ask that a letter I wrote you last fall discussing this point be made a part of the Record following this letter.

I am sorry I cannot be at the hearing, but I will be happy to provide the Committee with any additional material it desires. Thank you for arranging for Mr. Glenn to testify. I certainly hope that some accommodation can be achieved that will assist this country's private shipyards without undue hardships on the Navy yards.

Sincerely,

Mark O. Hatfield
United States Senator

November 16, 1971

Senator Allen J. Ellender
Chairman, Senate Committee on Appropriations
Suite 1235
New Senate Office Building
Washington, D.C.

Dear Senator Ellender:

Within a short time, your subcommittee on Defense Appropriations will hold an executive session to consider the 1972 Department of Defense Appropriations bill, H.R. 11731.

I am particularly interested in language appearing in the House Report concerning Naval ship conversion, alteration, and repair. As a Senator from a state with private shipyards where the unemployed rate is very high, I am hopeful your committee can include similar language in the Senate Report.

The House Report makes no reference to differences between nuclear and non-nuclear repair work in the comments on pages 62-63. It would clarify Congressional intent if the words "non-nuclear" could be added as follows in the third paragraph:

> "Likewise, it is equally important that a realistic portion of non-nuclear conversion and overhaul work be assigned to private shipyards to retain an industrial base for instant reaction in the event of a national crisis."

In the House hearings, testimony in support of such language was offered on June 10 by Mr. George Wintz.

I hope you will agree to the addition of such language in the Senate Report.

Thank you for your consideration of this request.

Sincerely,

Mark O. Hatfield
United States Senator

PLIGHT OF THE WEST COAST SHIP BUILDERS AND REPAIR INDUSTRIES

Senator PACKWOOD. Mr. Chairman and Senator Young, I am most appreciative of the opportunity to appear before your subcommittee this morning and introduce my friend and constituent, Mr. Ed Glenn, who will testify on behalf of the Western Shipbuilders Association. Mr. Glenn serves as assistant to the president of the Western Shipbuilders Association and is a member of its board of directors. He is the assistant to the president of the Willamette Iron & Steel Co. of Portland, Oreg., and Richmond, Calif.

The Western Shipbuilders Association has about 125 members in the shipbuilding and ship repair industry, the materials supplier to that industry, and, significantly, the labor unions associated with that industry.

Mr. Chairman, the plight of the shipbuilding and ship repair industry on the west coast is of great concern to me. I have addressed myself to this question on the floor of the Senate on a number of occasions and have corresponded with the Department of the Navy and with members of this committee on this subject during the past 3 years.

I know, only too well, of the situation in Portland, Oreg., where I have seen what was once a thriving waterfront community employing upwards of 3,000 to 4,000 men on ship repairs and ship conversions dwindle to the point that today the number of jobs in that industry is more like 300 to 400 rather than 3,000 to 4,000. It is my understanding that the same situation is true in many west coast communities.

The ultimate cause of this drastic diminution of jobs is readily traced to the reduction in the amount of naval conversions, alterations, and repair work available to the private ship repair facilities on the west coast.

As an example, in the 13th Naval District, there were 20 invitations to bid on a dollar volume of $22,300,000 in the year 1965. Similar figures for the year 1970 show that there was one invitation to bid on a contract of $4,947.

In my opinion, these policies of the Navy must be modified so as to preserve and protect this segment of the west coast economy which in years past has proven itself to be vital to our national defense posture.

I have read Mr. Glenn's prepared testimony and commend it to you and agree with it. It is my pleasure to present Mr. Glenn and, I believe, Mr. Hood, who will be testifying with him. Thank you very much.

Chairman ELLENDER. Thank you very much, Senator.

STATEMENTS OF:

EDWARD J. GLENN, ASSISTANT TO THE PRESIDENT, WESTERN SHIPBUILDING ASSOCIATION

EDWIN M. HOOD, PRESIDENT, SHIPBUILDERS COUNCIL OF AMERICA

LEGISLATIVE ACTION REQUIRED TO SAVE PRIVATE SHIPYARDS

Chairman ELLENDER. All right, Mr. Glenn and Mr. Hood, I understand you will testify on the same subject. Mr. Glenn, you may proceed, sir.

Mr. GLENN. Mr. Chairman, Senator Young, my statement this morning in behalf of the Western Shipbuilding Association has already been made available to the members of the subcommittee, so my remarks here this morning will attempt to emphasize some of the points which we have covered in the detailed statement.

STATEMENT OF EDWARD J. GLENN

Chairman ELLENDER. Your whole statement will be put in the record at this point. You may highlight it.

Mr. GLENN. Yes, sir.

(The statement follows:)

Mr. Chairman, members of the subcommittee.

My name is Edward J. Glenn. I am the assistant to the president of the Willamette Iron and Steel Company, which has shipyards in Portland, Oregon and Richmond, California. I am also assistant to the president of the Western Shipbuilding Association, and a member of the Board of Directors of the Association. The Association represents shipbuilding and ship repair yards, suppliers, labor organizations, and other important related segments of the maritime industry on the Pacific coast. I appreciate the opportunity to appear before the subcommittee on behalf of the Western Shipbuilders Association, in order to present to the subcommittee the need for legislative action to prevent further deterioration in the condition of the remaining private industry shipyards on the Pacific coast.

The immediate problem which requires the subcommittee's attention has resulted from the Navy's action in diverting most of the alteration and repair on non-nuclear Navy ships from the private industry shipyards to the Government-owned Navy yards. This work on non-nuclear Navy vessels, other than the largest, most complex combat ships, has historically been performed by the private shipyards.

The essential facts are these:

(1) For the past two years, the Navy has permitted private industry shipyards to bid on only a token amount of the Navy's requirement for alteration and repair work on non-nuclear ships.

(2) The policy of diverting such work on non-nuclear ships to the Government-owned Navy yards is unfair to the private industry shipyards and their employees. It results in unnecessary cost to the taxpayer. The resulting concentration of service facilities for the Pacific fleet may well involve certain military risk.

(3) The Navy's "home port" rule (which provides that alteration and repair work will be performed in the home port of a given ship) is illogical, and has in fact, been applied in an arbitrary manner by the Navy to justify the diversion of alteration and repair work to the Navy yards.

Cost To Taxpayers

Allowing the private industry shipyards to compete for the alteration and repair work on non-nuclear ships would save money to the taxpayer.

The most recent study of the comparative cost of performing such work in Navy yards and in private industry shipyards is a report prepared in 1972 by the certified public accounting firm of Ernst & Ernst. This study was sponsored by the Shipbuilding Council of America, which is presenting its own testimony to this subcommittee. The Ernst & Ernst report, which we understand has previously been furnished to the members of this subcommittee, merely confirms what cannot be seriously questioned -- that the private industry shipyards can do the alteration and repair work at a lower cost to the taxpayer.

Ernst & Ernst finds that a man-hour costs 49% more in Navy shipyards than in private shipyards. The report further finds that Navy shipyard man-hours exceed private industry shipyard man-hours by as much as 39% to 52% on similar projects. The combined impact of higher cost per man-hour and more man-hours to complete a job is persuasive evidence that Navy shipyard costs may exceed private industry shipyard costs by as much as 109% to 124%. The Ernst & Ernst report further suggests that private industry shipyards have capabilities to perform work on naval vessels far broader than those frequently expressed by Navy officials.

We understand that the Navy is now sponsoring a study by Arthur Anderson & Company of comparative cost of work performed in private ship-

yards and Navy yards. If history is any guide, Arthur Anderson & Company's study will also show that work performed in Navy shipyards is more expensive. In 1962, Ernst & Ernst submitted a report which showed that ship repair work was being performed in private industry shipyards at a much lower cost than in Navy yards. Soon thereafter, the Navy sponsored a study by Arthur Anderson & Company of the same cost comparison. The Arthur Anderson & Company study, which was completed in 1963, also indicated that the taxpayer saves money when work is made available to competitive bidding by private industry shipyards.

Reversal Of Historic Navy Policy

The assignment of alteration and repair work on non-nuclear vessels to Navy shipyards is a change in Navy policy. The previous policy was set forth in testimony before committees of the Congress by high-ranking Navy officers. Two examples of such prior statements will suffice:

(1) In testimony before the Senate Committee on Armed Services in March 1963, Admiral Ralph K. James, Chief of the Bureau of Ships, testified that "it has been the practice to assign auxiliary and smaller type ships to private shipyards for conversion, alterations and repairs and private shipyards have performed up to expectations."

(2) In testimony before the Sea Power Subcommittee of the House Committee on Armed Services in June 1970, Admiral John W. Dolan, Jr., Deputy Commander for Field Activities, pointed out that the more complex, difficult repairs were performed in Navy shipyards and that those ships which approximate merchant vessel construction were repaired in private yards.

This previous policy was eminently sound, and took advantage of the lower cost of ship repair available in private industry shipyards.

Alleged Complexity Of Work On Modern Ships

The Navy has attempted to justify its recent policy of diverting alteration and repair work to Navy shipyards by arguing that modern vessels are too complex to be repaired in private industry shipyards. This argument overlooks the fact that 90% of all Navy vessels are built in private shipyards. It is difficult to understand why private industry has the know-how and facilities to build the Navy's modern vessels, but not to repair the same vessels.

While certain alteration and repair work might be beyond the capability of some private shipyards, we believe that the Navy has overgeneralized concerning the capability or lack of capability of Navy shipyards and private industry shipyards.

As a matter of fact, many private industry shipyards have invested large sums of money in modernizing and upgrading their physical facilities, in manpower training, and in developing technical libraries, engineering data, and quality control, in order to be able to perform work on the newer, more complex ships.

Impact Of Work On Nuclear Ships On Statistics Concerning Alteration And Repair Work

A substantial portion of the Navy's conversion, alteration and repair funds today are earmarked for nuclear powered vessels. The dollar value of work performed on nuclear powered vessels is very large. It is not unheard of for alteration and repair work of a single nuclear powered vessel to cost 50 million dollars. Such work is in fact limited to approximately three large shipyards, all located on the east coast. In contrast, the repair work on non-nuclear ships performed by members of our Association typically ranges

in contract amount from $100,000 to two to four million dollars. As a result of the high cost of work on nuclear vessels, any statistics on conversion, alteration and repair funds, to be meaningful, must provide a breakdown as between nuclear and non-nuclear work. Work on the non-nuclear vessels is the only alteration and repair work that can be performed in private industry shipyards on the west coast.

We regret that we are unable to provide the subcommittee any statistics on the diversion of non-nuclear alteration and repair work to Navy yards. Such information is in the possession of the Navy. However, as businessmen, we know that such diversion is a fact. Our best estimate is that the private industry shipyards on the west coast, which are unable to perform work on nuclear vessels, are today securing less than 3 or 4% of the total amount of ship repair work.

Application Of The "Home Port" Rule

Part of the Navy's justification for removing most of the alteration and repair work on non-nuclear vessels from private industry competition, and diverting such work to the Navy shipyards, is based on the Navy's "home port" rule, which was announced in 1970. It is now said to be Navy policy that vessels be repaired and overhauled at their home port, in order to build the morale of crew members.

As an aside, we cannot but wonder how many members of a typical ship's crew -- which includes many young, single men drawn from all over the United States -- benefit from this rule.

In practice, the home port rule appears on occasion at least to have been administered primarily to benefit the Navy shipyard complex. If ships were actually repaired in their home ports, the huge Navy shipyard in Bremerton, Washington might be shut down, because, according to our best information, there are only five vessels with home ports in the Puget Sound

area. Similarly, the Navy shipyards at Hunters Point and Mare Island in the San Francisco Bay would be severely curtailed. We understand there are only approximately 26 vessels home ported in San Francisco. Nevertheless, despite the home port rule, the Navy has kept the Bremerton Navy Yard open by designating the Bremerton Navy Yard as the temporary home port of vessels repaired there.

Such practices have been tacitly admitted in a "discussion sheet" forwarded to Congresswoman Edith Green by letter dated July 16, 1971, from the Honorable Frank Sanders, then Assistant Secretary of the Navy. The fact sheet concedes that "the need to assign work on auxiliary ships to the naval shipyards to fill the workload gaps between major combatant ships" has been a "minor factor" in the assignment of such work to Navy shipyards.

Loss Of Private Industry Shipyards
Could Weaken Military Posture

If the Navy continues its policy of preventing private industry shipyards from bidding on most alteration and repair work on non-nuclear ships, the well-equipped and well-managed private industry shipyards on the Pacific coast will largely disappear.

Most of the private industry shipyards on the Pacific coast do not have the financial resources necessary to enter the field of new ship construction, which requires large capital investment.

It is completely unrealistic to suggest that the Pacific coast private industry shipyards could alleviate their current situation by competing for repair work on private merchant marine vessels. At least 70% of the vessels now calling at Pacific coast ports are foreign flag vessels. These foreign flag vessels obtain repairs in United States facilities only in an extreme emergency. The number of U. S. flag merchant marine vessels has drastically

declined, with the resultant loss to the private industry shipyards of this possible source of work.

Thus it is clear that, if the Navy's policy of performing most alteration and repair work on non-nuclear ships in Navy yards is continued, it will eventually result in the concentration of the entire Pacific coast fleet service facilities in the five large Navy establishments on the Pacific coast. Members of our Association do not claim to be military experts. However, we cannot help but wonder whether the resulting concentration of service facilities and ships of the Pacific fleet involves a certain unnecessary and undesirable military risk.

Maintenance of private industry shipyards at strategic locations on the three coastal areas of the United States, as a defense mobilization base, has long been recognized as essential. Our national experience in World War II, the Korean War, and the Viet Nam War has demonstrated that the private industry shipyards can perform a vital function.

During World War II, the private industry shipyards performed an industrial miracle in producing, maintaining and repairing the "bridge of ships" immortalized by the phrase of President Roosevelt.

In the Korean War, the private industry shipyards reactivated from reserve fleets more than 500 merchant ships which were used to support United Nations forces in Korea.

During the conflict in South Viet Nam, 172 merchant ships were reactivated by the private industry shipyards in order to support allied forces in Southeast Asia.

Members of our Association are well aware of the importance of the Navy shipyards and their strategic role in the national defense structure. We do not advocate closure of Navy shipyards.

However, we believe that the private industry shipyards are also an important part of the defense mobilization base. We are concerned that, when the Navy urges that almost all alteration and repair work must be diverted to the Navy shipyards in order to preserve them, it overlooks the importance of the private industry shipyards as a part of the nation's defense mobilization base.

Need For Legislative Solution

After hearing testimony on this problem, the House Appropriations Committee last year included in its report on the Defense Appropriation Act an expression of the Committee's concern and desire that private industry shipyards continue to be allowed to compete for their fair share of the overhaul and conversion work. The House Appropriations Committee's statement is as follows:

> CONVERSION, ALTERATION, OVERHAUL, AND REPAIR OF NAVAL VESSELS
>
> Information provided the Committee during the hearings and subsequently, indicates that the allocation of Navy overhaul and conversion work between public and private shipyards is beginning to change. With a winding down of operations in Southeast Asia and the de-activation of many Naval vessels, the amount of funds for conversions and overhauls is decreasing and the Navy is tending to place more of the work in public yards. During the Southeast Asian operations, and particularly at the height of the conflict, when large numbers of ships were re-activated, there were substantial funds appropriated for this work and a large allocation of work was made to private shipyards. For instance, during fiscal year 1967, 44.7 percent of conversion and overhaul work was allocated to private yards. For fiscal year 1972 the Navy is only planning to allocate 31.5 percent to the private sector of the economy.
>
> The Committee believes this to be low and encourages the Navy to consider the advisability of making a larger allocation to private shipyard operations.

> There is a very valid and realistic requirement to maintain Navy shipyards. Existing technical competence and the ability to take immediate action to satisfy the operational requirements of the fleet make it imperative that a hard core of Naval shipyards be adequately maintained and properly staffed. Likewise, it is equally important that a realistic portion of conversion and overhaul work be assigned to private shipyards to retain an industrial base for instant reaction in the event of a national crisis. As illustrated at the beginning of the Southeast Asia conflict, private shipyards were able to satisfy the increased demands of the Navy for the rapid activation of ships and vessels for combat operations.
>
> The entire problem of utilization of all shipyard facilities in the United States, both public and private, must be approached with a view toward working out a realistic, practical, and economical approach to the utilization of this capability in a manner commensurate with the best interests of the Government. The Secretary of Defense should give adequate consideration to this problem.

(House of Representatives Report No. 92-666, pp. 62-63).

However, the Navy has continued to divert this work on non-nuclear vessels to the Navy shipyards. Our Association has therefore concluded that only a legislative requirement that the private shipyards be allowed to compete for a substantial portion of the alteration and repair work on non-nuclear vessels will suffice.

There is a precedent for similar legislation. As the subcommittee knows, a specific requirement that 35% of the conversion, alteration and repair work be performed in private industry shipyards was included in the Department of Defense Appropriation Act for fiscal years 1963 and 1964.

That requirement was dropped from the annual appropriations acts after fiscal years 1963 and 1964, but Navy spokesmen indicated that the Navy would continue to observe the principle.

Because of the extremely high cost of work on nuclear ships, the 35/65 rule would no longer protect the private industry shipyards. While we recognize the difficulty of establishing any mathematical formula for distribution of the alteration and repair work on non-nuclear vessels, we believe that, in order to preserve the private industry shipyards on the west

coast, it will be necessary to base the distribution of this work on consideration of cost savings that will inure to the benefit of the taxpayers, and the maintenance of the defense mobilization base.

We are confident that we can save the taxpayers unnecessary costs if we are allowed to compete for alteration and repair work on non-nuclear ships. We ask only that you make it possible for us to compete for this work.

PROBLEMS FACING PRIVATE INDUSTRY

Mr. GLENN. As Senator Packwood pointed out, we have 125 member firms and labor organizations and about 10,000 shipyard workers. The association appreciates the opportunity to appear before your subcommittee to call to your attention the severe problem facing the west coast private industry. I refer to the action by the Navy in diverting more and more alteration and repair work on nonnuclear ships to the west coast Navy yards. It is accurate to state that the Navy is diverting alteration and repair work to the Navy yards.

Alteration and repair work on many types of combat vessels as well as noncombat ships has historically been performed by the private shipyards. There are two very important reasons why the private shipyards must be allowed to compete for alteration and repair work on the Navy's nonnuclear ships. First, we are confident that we can do this work at a much lower cost to the taxpayers.

Second, we believe that the national interest requires that the private shipyards receive enough alteration and repair work to insure their survival as part of the very important Nation's defense mobilization based.

The recent Ernst & Ernst report sponsored by the Shipbuilders Council of America, which was discussed on page 3 of my prepared statement, confirms what impartial observers have long recognized—that the private shipyards are more efficient and can do alteration and repair work at lower cost than the Navy shipyards.

The current Ernst & Ernst report confirms the earlier report issued by the same firm in 1962—that the private shipyards can do this work at lower cost to the taxpayers.

The second very important reason why the private industry shipyards should be allowed to compete for their fair share of alteration and repair work on nonnuclear vessels is the importance of our industry as a part of the national defense mobilization base. Members of our association are justifiably proud of the performance of private shipyards in World War II, the Korean war, and the Vietnam conflict.

COMPETITION IN PRIVATE SHIPYARDS

In order to survive, the private shipyards on the west coast must have the opportunity to compete for more alteration and repair work on the Navy's nonnuclear ships. The members of our association do not have the capability to compete for new ship construction. As a result of the increase in foreign-flag carriers and the decrease in the U.S. merchant marine fleet, very little repair work on merchant vessels is available. Therefore, the members of our assoication must be allowed to compete for more alteration and repair work on the nonnuclear ships of the Navy if we are to survive.

I have emphasized that our association needs alteration and repair work on the Navy's nonnuclear ships. Only a very few private shipyards, all located on the East Coast, have a capability of performing work on nuclear vessels. The high cost of work on this type of vessel tends to exaggerate the amount of alteration and repair work available to the private shipyards. The nonnuclear Navy—or rather the work must be separated and considered a division of work between the Navy and the private industry shipyards; otherwise, almost all of the

work available to the private shipyards will consist of work on nuclear ships. This work, as a practical matter, is not available to the west coast private shipyard industry.

Last year, the House Appropriations Committee held a hearing on this problem. The committee expressed its opinion that Navy shipyards and the private shipyards were both essential to the Nation's defense mobilization base; nevertheless, the Navy has continued to divert more alteration and repair work to the Navy yards.

We therefore believe that this situation requires action to assure that funds appropriated for this work are expended in such a way as to insure the survival of the private industry shipyards on the west coast. Thank you, gentlemen.

Chairman ELLENDER. Thank you, Mr. Glenn. The Navy, of course, takes the position that, if you take the whole picture, the Navy's work is cheaper.

I believe that the Navy contends that, once a contract is let, any change orders tend to increase the cost to a much greater degree than would occur if the work were done in a Navy yard. Also, I might point out that of the amount spent on conversions of vessels, 32.4 percent goes to private yards.

Mr. GLENN. Senator, as I pointed out, this is very true—we talked in terms, if you recall, a number of years back, of a 35–65 division. The Navy points with pride to the present 35 percent they are giving to private shipyards, and it goes to about three shipyards here on the east coast. They are equipped to handle all of this nuclear work.

It must be identified separately—this is the important thing—alterations and repair as distinguished from conversion. You see, the conversion covers the nuclear vessels, and this is where the dollars are going in respect to private yards.

Chairman ELLENDER. Am I to understand western shipbuilders are not capable of doing work on nuclear vessels?

Mr. GLENN. On nuclear vessels, we are not equipped.

Chairman ELLENDER. Senator Young.

REDUCTION OVERALL

Senator YOUNG. First, Mr. Glenn, when the number of ships in the Navy has been reduced as is being done now, there won't be nearly as much repair work available to Navy yards or private yards.

Mr. GLENN. I understand that, Senator. We understand it as an association and as businessmen. On the other hand, all we ask for is a fair and equitable distribution, not to concentrate all of the work in the Navy yards. There are many thousands of skilled craftsmen on the Pacific Coast that are having to turn to other types of work because no work is available for them, while the Navy yards, if you will, continue to build up or at least hold to a high level. All we ask is a fair share.

Senator YOUNG. I think it is important to keep the private yards going. Have you had any prolonged strikes on the part of workers that tied up your work for a long time?

Mr. GLENN. We have had some. We have had several strikes of short duration. But the point is being made, sir—and I don't mean to put words out here—that the Navy yards are not subject to this. I don't know that that is the fact. But they, too, are subject to organization

today. Their problem along this line, I think, is pretty well the same as ours.

Senator YOUNG. I don't think they have quite the strike problem that private industry has.

Mr. GLENN. I suspect that is right.

Senator YOUNG. But I share your concern that private shipyards should be kept going.

Mr. GLENN. It is very important to the Nation's defense mobilization base. Thank you very much.

Chairman ELLENDER. I took that same position several years ago, and I am still of that opinion. We have four naval shipyards on the west coast—Long Beach, Mare Island, Hunters Point, and Puget Sound; and also the yard at Pearl Harbor. On the east coast we have naval shipyards at Boston, Philadelphia, Norfolk, Charleston, and Portsmouth. So I think the Government work is pretty well distributed.

Our next witness is Mr. Edwin M. Hood, president of the Shipbuilders' Council of America. Mr. Hood has appeared before the subcommittee on several previous occasions, and we value his testimony very much. You may proceed, Mr. Hood.

STATEMENT OF EDWIN M. HOOD

Mr. HOOD. Mr. Chairman and Senator Young, I have a very brief statement, and I won't go through it in the interest of time.

Chairman ELLENDER. You may file it for the record.

Mr. HOOD. Yes, sir; but I would just like to call your attention to attachment A to the statement, which relates to the distribution of repair and alteration work between the naval and private yards. As you will see, starting along about 1966 and on through to 1971, there has been a steady decline in the volume of work that has gone to the yards that are capable of performing repairs and alterations. This is really at the root of the problem to which Mr. Glenn refers.

These figures are supplied by the Naval Ship Systems Command, and they illustrate the downward trend in repair and alteration work in the private yards. That is on a national basis.

Chairman ELLENDER. Yes. That will be made a part of the record.

Mr. HOOD. All right, sir. Thank you very much.

Chairman ELLENDER. Thank you very much, Mr. Hood.

Any questions?

Senator YOUNG. No questions.

(The statement and attachments follows:)

My name is Edwin M. Hood. I am President of the Shipbuilders Council of America, an industry association composed of shipbuilders, shiprepairers and shipyard suppliers in all sections of the country. Our organization has been in existence since 1921. I have been President since 1961, and since 1968, also Chairman of the Board of Directors.

My purpose this morning is to spotlight a situation which is adversely affecting an essential segment of our industry and which simultaneously has a relevance to the level of defense appropriations not only in Fiscal '73 but years to follow.

The problem to which I refer, however, should first be put in perspective. As you will see from Attachment "A," the dollar volume of naval ship repair and alteration work awarded to privately-owned, commercially-operated shipyards has followed a generally downward trend since 1966. This situation has caused a decline in employment and unstable operations in those yards whose primary activities center on the repair, maintenance, overhaul and alteration of ships. For brevity, I will use the term "repair and alteration" to cover this entire category of analagous shipyard functions.

It should be especially noted - and emphasized - that my testimony is directed solely to "repair and alteration." The situation to which I refer does not involve new construction or conversions of existing vessels performed mostly by yards in somewhat different categories. This distinction is important for conditions applicable to yards in these latter categories are subject to different influences.

Attachment "A" indicates that the preponderant share of Navy ship repairs and alterations is being, and has for some while been,

assigned to government-owned, government-operated naval shipyards. Whatever justifications may be offered for this disproportionate allocation of work, one would assume that relative costs and efficiency, especially in a lingering period of national budgetary crises, would in large measure be controlling.

On the contrary, the latest available evidence suggests that a steadily increasing volume of repair and alteration work is going to higher cost naval shipyards. A survey completed late last year by the independent Ernst & Ernst accounting firm indicates that naval yard costs may be more than double those of private yards. A copy of the full Ernst & Ernst report has already been forwarded the Chairman of this distinguished Subcommittee, and a summary of its conclusions is contained in Attachment "B."

The Ernst & Ernst findings show that the dollar cost of a man-hour in naval shipyards is 49% more than in private shipyards. These findings also indicate that, for similar jobs, naval shipyard man-hours exceed private shipyard man-hours by as much as 39% to 52%. The combined impact of higher dollar costs per man-hour plus more man-hours to complete a job further indicates that naval shipyard costs may exceed private shipyard costs by as much as 109% to 124%.

In addition, the Ernst & Ernst survey suggests that the private shipyard industry has capabilities to perform work on naval vessels far broader than those frequently expressed by Navy officials. This finding, in our judgment, renders inaccurate repeated declarations, again by Navy officials, and others, that naval shipyards must

be maintained regardless of cost and relative efficiency to do those things which private yards are allegedly incapable of doing.

If private yards were allocated $350 million in repair and alteration work by the Navy in 1966, and less than $150 million in 1971 (see Attachment "A"), it is obvious that the private shipyard industry has, at this moment, substantial available and unused capacity and know-how to undertake a much greater volume of this type of work.

It is the position of our membership that a cost differential in the magnitude of 109% to 124% - or even half that amount - should not be casually accepted, particularly when there is capacity and capability in the private sector to accomplish identical work at lesser cost to the public treasury. This is not an overly simplistic view, but one that supports the announced objectives of this Subcommittee - and other Committees of the Congress - to examine doubtful expenditures for defense purposes in a most complex era of world and domestic turmoil.

The long-standing policy of this nation has been that the government should rely fundamentally on private enterprise for the procurement of goods and services. In light of the Ernst & Ernst conclusions, it is difficult to rationalize the Navy Department's continuing practice of assigning approximately 75% of all repair and alteration work to naval shipyards at apparently twice the costs of private yards. Economic realism would suggest that nothing less than a reverse ratio should prevail.

Of course, reductions in the numbers of ships in the active naval fleet, such as have been taking place over the past five years,

have accordingly reduced opportunities for repair and alteration work for both private and naval shipyards. But, if national policy is to have credible meaning, if public and Congressional demands for "more economy in government" and for "more defense for the dollar" are to be rationally met, if the mobilization base of the private sector is to be appropriately preserved, it does not seem unrealistic to expect that the preponderant share of naval ship repair and alteration work should be awarded to lower cost operations.

With allocations for repairs and alterations in naval yards averaging between $600 million and $700 million annually for the Fiscal 1967-1971 period, the potential dollar savings through greater utilization of private yards can be quickly estimated. Deducting 40% from a median figure of $650 million for the cost of Government and shipyard furnished materials and equipment, and applying 116% (average of 109% and 124%) to the resultant amount of $390 million annually for actual shipyard work, it can be reasonably concluded that the same volume of work could have been performed by private yards for approximately $180 million; in other words, a potential annual saving of $210 million or a total of approximately $1 billion for the five-year period.

Picture what this potential dollar saving would mean in terms of opportunities - now lost and gone - to produce urgently needed ships to modernize the U.S. naval fleet and to neutralize the ever-growing challenge of the Soviet Union on the oceans. One billion dollars could have enabled the construction of approximately -

10 SPRUANCE class destroyers (DD-963) or
6 General Purpose Assault Ships (LHA) or
6 Nuclear Attack Submarines (SSN-688 class) or
4 Nuclear Guided Missile Frigates (DLGN) or
1 Nuclear-Powered Aircraft Carrier (CVAN)

Prospectively, $1 billion dollars would build 20 vessels in the 50 ship patrol frigate (PF) program now under contemplation.

Also, it could be logically contended that savings of the magnitude projected would have obviated the necessity of laying up many of the vessels now in mothballs. And, the structure of today's Navy would be quite different.

We are not unmindful of the Navy's complex problems in assuring the constant effectiveness of a smaller fleet, nor in assuring that ships undergoing repair or alteration are promptly returned to duty stations at sea. We do suggest, however, that there may be a better way to handle the repair and alteration problem, whereby the lower costs and greater efficiencies of private shipyards could be employed to far better advantage.

ATTACHMENT A

ALLOCATION OF FUNDS TO SHIPWORK BETWEEN NAVAL AND PRIVATE SHIPYARDS FISCAL YEARS 1962 - 1971
REPAIRS & ALTERATIONS
($000 Omitted)

Year	Naval	Private	Total	% Private
1962	$309,909	$133,400	$527,700	25.3
1963	309,909	140,487	450,396	31.2
1964	315,053	150,972	466,025	32.4
1965	432,962	148,620	581,582	25.6
1966	511,044	349,619	860,663	40.6
1967	664,088	352,494	1,016,582	34.7
1968	667,896	264,106	932,002	28.3
1969	665,022	235,521	900,543	26.2
1970	593,331	214,358	807,689	26.5
1971	677,430	142,315	819,745	17.5

Tables shows "Program Value" or "End Cost" which includes both Shipyard and Government Furnished Equipment Costs. MSTS repairs are not included.

HIGHLIGHTS ATTACHMENT B

SURVEY OF COST DIFFERENTIALS AND OTHER FACTORS
PRIVATE vs NAVAL SHIPYARDS

ERNST & ERNST

Department of the Navy officials have acknowledged in Congressional hearings that in certain cases it is more costly to perform ship work in Naval yards than in private yards. Rear Admiral Nathan Sonenshein has testified that to build the SSN-668 Class Nuclear Attack Submarine in Mare Island Naval Shipyard instead of in private shipyards "would increase the cost we have estimated by something on the order of $75 million /per ship/."* Admiral Sonenshein also indicated that the Navy's 1972 budget estimate for each SSN was $175.5 million per hull.* The budget prices were based on the assumption that private yards would do the construction. Thus, the $75 million cost increase, expressed as a percentage of the budgeted price, indicates that ship work costs at Mare Island Naval Shipyard are approximately 43 percent higher than in private yards. Vice Admiral Hyman G. Rickover has testified, "Since 1961, with one exception, it has cost 15 percent to 125 percent more than at private yards and 10 percent to 40 percent more than at other Navy yards to build and overhaul comparable nuclear submarines at Portsmouth."**

In recent years Navy and DOD spokesmen have repeatedly defended the policy of assigning 60 to 70 percent of the Navy's conversion, alteration, and repair work to the Naval shipyards, using several arguments. One of these is that the private shipyards lack capability to handle the new larger and more complex Navy vessels.

Against this background we conducted our survey to measure the cost

* Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 92d Congress, First Session, p 583

** Hearings before a Subcommittee of the Committee on Appropriations, House of Representatives, 91st Congress, Second Session, Part 7; testimony of Vice Admiral Hyman G. Rickover

differentials between performing ship work in private versus Naval shipyards and to document private industry's assessment of their capability to perform work on Navy vessels of various sizes and sophistication. Highlights of our study approach and major conclusions are presented below:

(1) Two types of questionnaires (financial and capability evaluation) were mailed to over 200 of the companies holding Master Ship Repair contracts with the Navy.

(2) Estimates of private shipyard costs were based on the responses of 21 companies to the financial questionnaire. These companies represent approximately 23 percent of the shipbuilding and ship repair industry.

(3) The summary of private shipyard capability is based on the responses of 34 shipyards (23 companies) to the capability evaluation questionnaire.

(4) Estimates of Naval shipyard costs were based on information presented in the FY70 Navy Industrial Fund Financial and Operating Statements prepared by each Naval shipyard.

(5) Adjustments were made to both private and Naval shipyard reported costs for items not included in their respective accounting systems. DOD instructions for cost comparisons were used as a guide. In cases where adjustments could be calculated in more than one way, a position favorable to the Navy was generally taken.

(6) Value Added was used as a measure of the resources contributed by the shipyards to accomplish ship work. Value Added includes profit, labor costs, and certain overhead costs; it excludes direct and indirect materials, subcontracted work, supplies, fuel and electric energy, etc. Computing Value Added per Production Worker Hour provided a base of common elements to measure the difference between the cost of a man-hour of effort in private and Naval shipyards.

(7) Based on Value Added per Production Worker Hour comparisons, we computed a Cost per Hour Differential of 49 percent. Assuming that different sets of adjustments to private and Naval shipyard costs had been used, we computed a range for the Cost per Hour Differential. Naval yard costs exceeded private yard costs by 44 to 79 percent.

(8) Higher overhead costs in Naval shipyards account for most of the 49 percent Cost per Hour Differential:

Average wage rate	5 percent
Leave, vacation, holiday, pension, Social Security, and health and life insurance	8
Overhead costs in Value Added	36
Cost per Hour Differential	49 percent

(9) We computed a Performance Differential between Navy and private yards. A comparison of the man-hours expended by the Philadelphia Naval Shipyard and Bath Iron Works to complete the DLG conversions was the basis for the computation. The Naval yard man-hours exceeded private yard man-hours by 39 to 52 percent.

(10) We computed a Total Cost Differential between Navy and private shipyards that reflects the impact of both the Performance Differential and the Cost per Hour Differential. This computation indicates that Naval shipyard costs could exceed private shipyard costs by 109 to 124 percent.

(11) Responses to the capability questionnaire illustrate that private shipyards have significant capability to perform all types of work on all classes of Navy vessels, particularly when viewed in relation to the size and composition of the US Naval fleet. The number of yards responding that they had the capability to perform ship work is presented below for selected categories of Navy vessels.

Number of Ships in US Naval Fleet	Category	General Capability			
		Construction	Major CAR	Minor repair	Dry-dock
18	Carriers	1	9--11	17--20	3
9	Cruisers	2--4	13--17	22--24	10--16
159	Destroyers	6--13	15--17	22--28	16--23
144	Submarines	5--6	10--14	16--29	10--17
76	Escorts and Patrol Ships	14--18	27--30	28--29	23--25
120	Amphibious and Mine Warfare Ships	7--14	19--29	23--28	15--25
181	Auxiliary Ships	6--18	18--31	23--30	12--24

A yard was included in the figures as "having capability" if its response on the questionnaire was coded either 1, 2, or 3: (1 = Shipyard has undertaken this type work for this ship type since 1965; 2 = Shipyard presently has the internal capability to perform this work for this type of ship; 3 = Shipyard has the capability to perform this work for this type of ship with subcontractor assistance.)

STATEMENT OF ADM. ALEXANDER JACKSON, JR., DEPUTY EXECUTIVE DIRECTOR, RESERVE OFFICERS ASSOCIATION OF THE UNITED STATES

ACCOMPANIED BY COL. JOSEPH L. CHABOT, DIRECTOR, ARMY AFFAIRS DIVISION, RESERVE OFFICERS ASSOCIATION OF THE UNITED STATES

INTRODUCTION OF ASSOCIATE

Chairman ELLENDER. The next witness is Admiral Jackson.

Admiral JACKSON. Good morning, Mr. Chairman. I would like to introduce Col. Joseph L. Chabot, Director of our Army Affairs Division. He is here in the event you have questions to ask about the Army Reserve.

STATEMENT OF COL. JOHN T. CARLTON, EXECUTIVE DIRECTOR

Mr. Chairman, I would also like to request permission to place our statement in the record and for me to just briefly comment on it.

Chairman ELLENDER. Very well; that will be done. The statement will be put in the record. You may highlight it.

(The prepared statement of Col. John T. Carlton, Executive Director, Reserve Officers Association of the United States, presented by Admiral Jackson, follows:)

(The statement follows:)

Mr. Chairman and Members of the Committee:

We appreciate this opportunity to express our views on Reserve appropriations for the Reserve Components of our Armed Forces for Fiscal Year 1973.

It is a privilege to appear before you and your distinguished committee to make recommendations with respect to these Reserve Forces which, together with the Coast Guard Reserve, will provide the great bulk of our fighting forces in wartime.

The total increase in appropriations recommended for the Reserve Components seems significant. Yet, as previous testimony from Service witnesses undoubtedly indicates, the major proportion of the increases requested result from the sharply rising personnel costs.

The total request represents an increase for FY 1973 end strength for the Army, Navy, Marine Corps and Air Force Reserve of about 3,000 over FY 1972.

This is a surprisingly small increase in consideration of the very sizeable proposed reduction in the size of the active force strength.

This is in face of the testimony, it is reported, you have heard from departmental witnesses concerning the fact that the Reserve is a part of the "total force" concept.

They admit and testify publicly to the economy of the Reserves (address by Assistant Secretary Roger T. Kelley to the Rotary Club of Charleston, South Carolina as reported on page 18 of the December 1, 1971 issue of the Air Force Times).

There has been much talk of the principle that "as the active force goes down in strength the Reserve force should go up."

We ask you to compare (the exact figures can be furnished by the Defense Department) the percentage loss by the active forces in the past year as compared to the proposed percentage gain in the strength of the Reserve components.

An examination of the strength figures over the past ten years will show that the Reserve forces did not share in the strength gains of the active forces, yet there are those who propose that they (the Reserves) should share in the strength cuts now being undergone by the active forces.

We submit that this is false economy. Mr. Kelley, quoted above, in his statement before the Senate Armed Services Committee of February 8th on military manpower requirements made this observation:

"In FY 1973, it will cost $9,100 to pay, clothe, and feed the active force military member -- which is five times the cost of maintaining his Guard or Reserve counterpart.

"The implication is clear. With greater reliance on the Guard and Reserve, we can provide more defense for the dollars invested. In short, the Guard and Reserve is a security bargain, and we intend to fully exploit its potential."

It seems logical therefore that your approval of increased appropriations for the Reserve components for the next fiscal year may actually represent future savings in overall defense costs.

As an example, although we are aware that this matter is not within your committee's direct jurisdiction, increased incentives for participation in the Reserve Components will result in real savings to the taxpayer.

A primary example are the various proposals for enlistment and reenlistment bonuses for participation in the Ready Reserve. Even a bonus of a considerable number of dollars, if accepted by a trained Reservist, will save several thousand dollars invested in the enlistment, initial basic and technical training of a non-prior service enlistee. Thus we say incentives to build the strength of the Ready Reserve should be evaluated, not in immediate budgetary requirements, but rather in terms of long-range savings -- and even more importantly in Reserve readiness.

Nevertheless, we believe that, in consideration of the lack of appropriate incentives to attract and retain Reservists, especially enlisted personnel, that the Reserve Personnel appropriations requests, with the exceptions outlined below, represent, for the forthcoming fiscal year, reasonably acceptable levels.

Before we briefly outline the specifics concerning the Reserve Components of each service we wish to bring to your attention two matters which we strongly believe worthy of your consideration. They are:

(1) The urgent need for a separate Operations and Maintenance appropriation for the service Reserve Components, similar to

that now provided the Army and Air National Guard. This is a necessity to provide for the integrity of these components.

(2) The necessity for a separate line item in the budget of the various components for the procurement of weapons systems and equipment for Reserve Components -- to be provided without expense to active forces.

The following analyses of Service Reserve personnel appropriations requests are limited to those for pay groups A, B, D and E for special tours and administrative support (including reimbursables).

ARMY RESERVE PERSONNEL APPROPRIATION

We support the administrations FY 73 budget for Army Reserve personnel of $531,334,000 to provide a FY 73 end strength of 262,500 in units of the Army Reserve plus 41,153 in pay group D individual training, and subsistence for ROTC students. However, we believe that the 261,300 average strength that this budget request provides for the Army Reserve poses a strategic risk in view of the great reductions which have been made and are now taking place in the active Army from a recent peak of approximately 1 1/2 million men to less than 865,000 by 30 June of this year.

We do not believe this continued annual strength authorization of about 260,000 for the Army Reserve is in accord with the publicly announced policies of the administration and the Secretary of Defense to provide increased strength and capability in the Reserve as active force strength and capability are reduced.

We understand that the strength authorizations requested for the active Army and its Reserve Components for FY 73 do not provide the strength to maintain the number of units, especially combat type units, needed to meet the known requirements of contingency and mobilization plans.

History has shown us repeatedly that when we permit our Armed Forces to drop below recognized needs, commitment of these inadequate forces to meet national security requirements causes a heavy and unnecessary loss of life and other unnecessary costs in the initial stages of any such conflict.

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Recently, we prepared cost studies which show that units in the Reserve Components can be maintained for about one-sixth of the costs of maintaining similar units in the active forces. Our findings indicate, that in a total force structure concept, Reserve units should be activated in place of active force units whenever they are capable of meeting the readiness requirements established in contingency and mobilization plans.

From reports and experience, we know that many Reserve units attain a combat readiness exceeding that of similar units in the active Army because the experienced officers and noncommissioned officers in Reserve units remain in their assigned positions long enough to develop the morale, teamwork and individual competence needed to develop an outstanding military organization.

While we recognize that it is too late now in the planning, programming and budgeting cycle for FY 1973 to effect an increase in the authorized strength of 261,300 proposed for the Army Reserve in HR 12604 We strongly urge that consideration be given now by all concerned to provide for a sufficient increase in the authorized strength of the Army Reserve in FY 1974 and thereafter, to activate the additional combat and other type units needed to meet contingency and mobilization plans.

Furthermore, we considered it to be a disservice to our country not to recognize the peril to our internal security which might be posed in a future national crisis by the lawless elements which have proliferated in our society in recent years.

In restraining these lawless elements, it is possible that a considerable number of our combat divisions in the National Guard may not be available for commitment overseas in a national emergency. This consideration, we believe, provides additional justification for the activation of additional combat units and other type units in the United States Army Reserve. Therefore, we urgently recommend that at least six combat divisions, (or their equivalent in combat capability) unimpeded by internal security missions, be established in the United States Army Reserve at the earliest possible time.

Additional combat units could be manned by the many thousands of dedicated young officers and men who are now leaving or have recently

left the active forces, provided adequate enlistment and reenlistment incentives are made available.

This will require legislation.

Under the zero draft environment or Voluntary Armed Forces concept the Reserve Components need incentives similar to those provided the active forces to induce new and prior-service men to participate in Reserve units.

These incentives have not yet been asked by the DoD, and Reserve Component unit strength is dropping sharply.

If the "total force" concept is to succeed, then all concerned must act to provide Reserve unit commanders the incentives needed to increase the experience level in their units by enlisting a greater percentage of prior-service men and retaining experienced men now leaving the Reserves in large numbers.

A material increase in the percentage of prior-service men will greatly enhance Reserve unit readiness and enable the Reserves to meet the early deployment schedules required by current contingency plans.

NAVAL RESERVE PERSONNEL APPROPRIATION

Four years ago, upon the initiative of the Congress, the authorized minimum average strength of the Navy's Selected Reserve was increased by 3,000 bringing over-all average minimum strength to 129,000. This strength was achieved by the Navy and the action resulted in a substantial improvement in the readiness of the Navy's Selected Reserve. The increase was made at a time when the active Navy was also in an expanded situation. At that time, the Navy presented a plan which would build the strength of the Selected Reserve to an ultimate strength level of 139,000 with annual incremental increases of 3,000. Actually, the Navy's immediate mobilization requirements amount to a figure significantly higher than 139,000.

Nothing has been heard of the 3,000 incremental increases since the Congress took the initial action. And now, Mr. Chairman and members of the committee, we are in a situation where the active Navy has been significantly reduced, and we continue with a Selected Reserve of the same authorized size.

It is axiomatic that when the active forces decrease, the Reserve must be increased. However the closures of five Naval Air Reserve Stations, the closures of numerous Naval Reserve Training Centers and the transfer of some units to remote areas have destroyed the Navy's capability to generate this increase at this time.

These actions resulted in considerable confusion and loss of personnel strength which may have affected the combat-readiness of the force. Particularly serious is the loss of trained pilots and skilled technicians which may be both expensive and difficult to replace. We believe that economies and readiness cannot be achieved by moving units in areas of dense population to remote sites where attendance and recruiting problems are compounded.

In view of the turmoil and turbulence created by these closures in the Naval Air Reserve, we believe that it is impossible to meet the incremental increases, and we, therefore, support the administration's requested authorized strength for the Navy's Selected Reserve of 129,000 with an RPN appropriation of $230,640,000.

MARINE CORPS RESERVE PERSONNEL APPROPRIATION

We believe that the Marine Corps Reserve strength should be based on requirements of the Fourth Marine Amphibian Force rather than on the inability to recruit personnel to maintain minimum strengths or for any other reasons.

The Marine Corps is itself being reduced in strength and we would naturally look to an expansion in the Reserve.

The administration has requested this year an average strength of only 45,016, a reduction of 833 from last year and last year was reduced 1,886 below the previous year. We do not understand any rationale which would call for a reduction under the current circumstances.

We, accordingly, urge that the strength be set at no less than 45,849, the number authorized last year and that the administration's request of $78.2 million be increased sufficiently to support that number.

AIR FORCE RESERVE PERSONNEL APPROPRIATION

The Reserve personnel Air Force appropriation request of $116,680,000 (including reimbursable) to provide an end strength of

53,811 will support the program imposed on the AF Reserve for FY 1973.

AF Reserve flying units are still staggering from the turbulence caused by the conversions of FY 1971 and 1972. In general, these conversions can be supported by the need for modernization, with which we cannot conceptually, quarrel. However, that part of the conversion programs which resulted in the cut back of unit aircraft (and thus aircrews) authorizations, were, in our opinion, based on budgetary rather than military considerations. The same goes for the drastic reductions in the support elements of our tactical flying units. Further conversions are reported for FY 1973, hopefully planned to be less devastating than in the past two years.

Furthermore, it is our opinion that the AF Reserve Individual Augmentation program has been starved, not only for drill pay, but support funding for a number of years. This neglect must be overcome, particularly since the Air Force Reserve only, of the two components of the Air Reserve forces, is charged with furnishing individuals to the Air Force in case of war or emergency. The USAF (long-range) personnel plan approved for implementation by the Air Force, reveals the need for at least again as many as the currently funded 5,100 individual paid drill spaces in order to fill the non-rated desks that will be vacated by rated officers upon mobilization.

Notwithstanding the long-range deficiencies outlined above we are constrained to support the current request for Reserve Personnel, Air Force appropriations for FY 1973.

Because of the situation outlined in our general statement above we cannot comment with any degree of knowledge on the adequacy or validity of any request in the Air Force O&M appropriations, intially allotted for the Air Force Reserve.

SUMMARY

For the Army Reserve an RPA appropriation of $531,334,000.

For the Naval Reserve an RPN appropriation of $230,640.000.

For the Marine Corps Reserve an RPMC appropriation of $78.2 million.

For the Air Force Reserve an RPAF appropriation of $116,680,000.

Chairman ELLENDER. Before we go on, I have just been notified that there is a vote going on in the Senate.

(Whereupon, a brief recess was taken.)

Chairman ELLENDER. Admiral, you may proceed, sir.

Admiral JACKSON. Thank you, sir. Mr. Chairman and Senator Young, about 2 years ago, the Secretary of Defense announced a new concept which he labeled a Total Force Concept, and the significance of this concept is that the active forces and the reserve forces would form a team which would constitute the total force, and at that time he directed the Services all to strengthen their reserve forces accordingly. We would like to comment on that a little.

The Army has been reduced from a million and a half men to less than 900,000 men, but the Army Reserve has not been strengthened by one single man. The Navy responded by closing five Naval Reserve air stations in a reorganization which caused a loss of 1,200 pilots. The Air Force had a reorganization and transitional program to some some new aircraft, and that wound up by causing them to lose about 2,000 personnel. The Marines had reduced in the past two years their Fourth Marine Division and Air Wing team by 1,800 personnel. Their explanation was, they wanted to make it a lean, hard, tough division, but we noted that they don't apply the same formula to their active divisions.

If the reserve forces are strengthened and if this Total Force concept is moved into properly, it can be a definite asset to the country by reducing the defense appropriation and giving us an adequate national defense. We have conducted a study in depth and have determined that having the Army and Navy and Marine Corps Reserves in place of active duty units costs one-sixth as much as the active duty units do; and in the Air Force Reserve, it is one-fifth as much. Of course, that difference in the Air Force Reserve is due to flight pay.

We in the Association are enthusiastically in support of this concept, and we would like to point out that the Reserve can do it. For example, all of the pilots in the Naval Air Reserve and Air Force Reserve come into that reserve with a minimum of four years' active duty experience. They are post-graduates of the active forces and their experience level as pilots is considerably higher than the experience level of the active forces.

So we want to make this point: If they are to do this, they must be properly supported and they must train in equipment that is currently used by the active forces; otherwise, all of the Reserves—the Army, Marines, and Air Force and Navy—will lose their significant capabilities and techniques.

We feel that one thing to be done in order to insure this is to establish a separate operations and maintenance appropriation for the reserve components similar to that now provided the Army and Air National Guard. This is necessary to provide for the integrity of these components.

We will conclude, Mr. Chairman and Senator Young, by saying that we support the Administration's budgetary requests. We are not asking for anything more. They are a little higher than they were last year, but that is all due to the pay increases, which you commented on earlier, Mr. Chairman. We appreciate your listening to us today.

Chairman ELLENDER. Thank you very much. Do you wish to add anything?

Colonel CHABOT. No, sir.

Chairman ELLENDER. Thank you very much.

STATEMENT OF CHARLES E. MATTINGLY, LEGISLATIVE DIRECTOR, NATIONAL LEGISLATIVE COMMISSION, THE AMERICAN LEGION

ACCOMPANIED BY:

JAMES R. WILSON, JR., DIRECTOR, NATIONAL SECURITY-FOREIGN RELATIONS DIVISION

MICHAEL SCHLEE, ASSISTANT DIRECTOR FOR NATIONAL SECURITY

NATIONAL DEFENSE VIEWS OF AMERICAN LEGION

Chairman ELLENDER. Our next witnesses are Mr. James R. Wilson, director, national security, Foreign Relations Division of the American Legion, and Mr. Charles E. Mattingly, legislative director, National Legislative Commission of the American Legion. Mr. Mattingly.

Mr. MATTINGLY. Chairman Ellender and Senator Young, my name is Charles E. Mattingly, legislative director, and, before introducing the expert witness, I want to thank you for this opportunity to present the American Legion's views on funds for our Nation's defense.

Our resolutions, as you know, and our official position, as you know, are established by either the national convention or the National Executive Committee of the American Legion after considerable study and consideration.

PREPARED STATEMENT

Mr. Chairman, our principal witness this morning is Mr. James R. Wilson, director of our national security, foreign relations division, and he is accompanied by Michael Schlee, assistant director for national security. Mr. Wilson has a statement which he is prepared to summarize and to answer any questions the committee would like answered.

Chairman ELLENDER. The full statement will be placed in the record at this point.

(The statement follows:)

Mr. Chairman, members of the committee, as spokesman for the American Legion, I thank you for this opportunity to express our views on the 1973 defense appropriations and what we consider vital minimum defense needs of our Nation.

The testimony I present is based upon resolutions adopted at our 1971 national convention by delegates from every section of our Nation representing the more than 2,700,000 members of our organization.

Because the majority of the resolutions appended to this statement originated in a local post or department (State), they represent a cross section of American opinion on defense policy and weapon systems.

In most instances, those finally adopted were given thorough consideration at the local, State and National level. This procedure is mentioned in order to dispel any thought that our stands are hastily conceived or considered.

Copies of the full test of these resolutions, which I have listed below by number and title, are appended to this statement. I respectfully request that they be made a part of the printed record of these hearings:

While the resolutions appended to this statement cover a wide range of military requirements, all are important to the American Legion. I would like to comment specifically on a few, which at this point in time, seem to us to warrant special attention.

Research and Development

The American Legion feels that we must maintain an over-all superior technological base and a more effective R&D effort than any other nation. The nature of our free society demands this. By action of our most recent national convention, we urged raising of our research and development expenditures in order to produce the advanced technology needed for national defense.

We support the 9.5% R&D increase requested in the 1973 budget. We endorse the Secretary of Defense's statement that "What must concern anyone responsible for our national security is the demonstrable fact that we could lose the technological race." In assessing the growing Soviet R&D (at a rate of 10% per year), we must simply face the unpleasant truth that we no longer possess the superior technological base which we enjoyed for so long.

For over a decade, the American Legion has urged our leaders to develop and deploy a credible antiballistic missile system as an integral part of this Nation's over-all strategic deterrent. We view the continued construction of the Safeguard ABM as necessary to provide an additional level of protection for two arms of our triad defense.

Continued efforts toward safeguard ABM deployment will afford our SALT negotiators options for bargaining in the interests of international agreements. We feel it would be unwise to stop work on safeguard before an effective treaty has been agreed to for mutual reduction in weapon systems.

We feel it is well within the competency of our existing technology to deploy Safeguard. Our view has been reinforced by the results of tests to date. We urge full funding be approved to assure the rapid and full deployment of the Safeguard ABM system.

Another weapon system, in our view, essential to the preservation of our triad concept is the B–1 bomber. It is imperative that the $444.5 million for the B–1 bomber be approved. We feel that manned bombers will be an essential part of our triad deterrent for the foreseeable future. By convention resolution, the American Legion has urged development and procurement of the B–1 bomber by timely and adequate appropriations in the current and future fiscal years.

Another area of vital concern to us is our Minuteman Force. We strongly urge the appropriations requested be approved for both R&D and modernization to improve the effectiveness and survivability of our Minuteman Force.

As our military forces are withdrawn from Viet Nam, and the total manpower strengths are reduced below 2,500,000, there is a compelling need to give ever greater support to the reserve components. Even with greatly increased pay and other benefits, an all volunteer armed force is not a certainty.

The recruitment of volunteers for the Active Forces has not been easy and it will be much more difficult for the Reserves and National Guard to achieve and maintain needed manpower levels. I feel that Secretary of Defense Laird has requested the funds in the 1973 budget and amply demonstrated his intention to make our Reserve Forces an effective part of this nation's defense—an integral component of our active military forces and our Nation's defense.

In addition to the cost savings by greater reliance on the Guard and Reserves, we feel that actually relying on the citizen soldier is in keeping with the finest American tradition.

The American Legion continues to advocate a Naval construction program of sufficient size and scope to forestall obsolescence of the fleet and to enable it to successfully accomplish its assigned missions and tasks over the total spectrum of war and peace. The United States Navy should at all times control the seas throughout the world for the protection of the interests of the United States of America for our foreign policy and the economic life lines of the free world against Communist aggression and subversion. We feel the funds recommended by the committee will move toward that objective and certainly supplement these objectives.

Secretary of Defense Laird stated the case for adequate defense when he said: "We realize that military power by itself is not an adequate prescription for peace. But in today's world, it is an indispensable element of a strategy designed to avoid conflict." The American Legion concurs.

In conclusion, Mr. Chairman, we earnestly hope and pray for the easing of world tensions, and for an era of world peace. We sincerely hope that tangible results will derive from the SALT talks and other negotiations directed toward reduced world tensions.

Yet in the light of present world conditions, *we feel America has no course other than to remain militarily strong.*

On behalf of the American Legion, I thank the subcommittee for this opportunity to briefly present our views on the 1973 Defense Budget.

Thank you.

ADOPTION OF RESOLUTIONS

Chairman ELLENDER. You may proceed, Mr. Wilson.

Mr. WILSON. Thank you very much, Senator Ellender and Senator Young.

I might say, before reading the very, very brief statement, that the young man who is now working with me is, himself, a Vietnam veteran and is still fulfilling his reserve obligation even though he served time in Vietnam.

As spokesman for the American Legion, I thank you for this opportunity to express our views on the 1973 defense appropriations and what we consider vital minimum defense needs of our nation.

The testimony I present is based upon resolutions adopted at our 1971 national convention by delegates from every section of our Nation, representing the more than 2,700,000 members of our organization. I might say, Senator Ellender, currently 500,000, or half a million, of those members are from the Vietnam conflict.

Because the majority of the resolutions appended to this statement originated in a local post or department—State—they represent a cross section of American opinion on defense policy and weapon systems.

In most instances, those finally adopted were given thorough consideration at the local, State, and national level. This procedure is mentioned in order to dispel any thought that our stands are hastily conceived or considered.

Copies of the full text of these resolutions, which I have listed below by number and title, are appended to this statement. I respectfully request that they be made a part of the printed record of these hearings.

Chairman ELLENDER. Without objection, it is so ordered.

(The resolutions follows:)

53RD NATIONAL CONVENTION OF THE AMERICAN LEGION HELD IN HOUSTON, TEXAS, AUGUST 31–SEPTEMBER 2, 1971

RESOLUTION NO. 330

Committee: National Security.
Subject: B–1 bomber.

Whereas, in a message to the Congress earlier this year, President Nixon clearly stated that "our strategic nuclear forces are the cornerstone of the Free World's deterrent against nuclear attack and must always be sufficient for this crucial role;" and

Whereas, to fulfill national objectives in strategic force planning, it is essential that the United States maintain a reliable retaliatory force, with primary emphasis on measures that both reduce vulnerability to attack and assure defense penetration; and

Whereas, in the strategic offensive forces area the Secretary of Defense has expressed concern about the potential vulnerability and the penetration capability of our bomber force in the years ahead; and

Whereas, to counter the threat of Soviet submarine launched ballistic missiles, the Air Force is taking steps to insure bomber survivability through improved and reliable warning from satellite systems, a dispersal basing program and reduced bomber reaction times; and

Whereas, despite these measures to improve the survivability of the B–52 and FB–111 aircraft, the Chief of Staff of the U.S. Air Force has stated that the Air Force's number one development program for strategic force improvement is the B–1; and

Whereas, the B–1 is being designed to enhance survivability in all modes of operation through faster reaction, increased resistance to over pressure, faster flyout time, higher speeds and lower altitudes during penetration, reduced radar cross section and greatly increased electronic countermeasure capabilities; and

Whereas, an engineering development contract was let on this aircraft in 1971 with a view of having a production decision made after first flight in April 1974; and

Whereas, the mixture of land and sea missiles and land bombers, commonly referred to as the TRIAD, is the most secure and reliable way to deter nuclear war, having the distinct advantage that an enemy cannot attack the three elements of the TRIAD simultaneously without giving warning; and

Whereas, the importance of the bomber force is emphasized by the fact that today it provides 32% of the United States megatonnage on day-to-day alert and 55% of the total megatonnage assigned to our strategic systems; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that the Congress and the Administration be again urged to support this critically important program for orderly development and procurement of the B–1 bomber by timely and adequate authorizations and appropriations in the current and future fiscal years, and calls for the reaffirmation by Congress that manned bombers in general and the B–1 in particular will be an essential part of our strategic TRIAD deterrent posture for as far into the future as we can currently perceive the threat.

RESOLUTION NO. 68

Committee: National Security.
Subject: Strategic airlift.

Whereas, the capability of the United States Armed Forces to respond promptly and decisively is essential in deterring, limiting or succeeding in an armed conflict throughout the world; and

Whereas, sufficient modern, responsive high speed strategic airlift is essential for the rapid deployment and support of ground forces, shortening reaction time and increasing combat effectiveness; and

Whereas, these airlift forces must contain a balanced mix of both Active and Reserve component military forces and the commercial resources of the airlines; and

Whereas, such an arrangement will provide a flexibility of lift capability which, when coupled with the prepositioning program, will permit ground forces to meet future deployment requirements; and

Whereas, an in-theater distribution capability commensurate with giving strategic lift potential is required to speed equipment and supplies from debarkation points to the user and to support tactical operations; and

Whereas, progress has been made in improving airlift capability by the inclusion of the C–141 and the programming of the C–5A aircraft into the active inventory; and

Whereas, total strategic mobility includes prepositioned unit sets of equipment and supplies at strategic locations throughout the world, on land and afloat; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that action be taken by the Congress to provide continued support for programs designed to develop sufficient amounts of strategic airlift to meet the operational needs of our ground forces.

RESOLUTION NO. 273

Committee: National Security.
Subject: F–15 fighter aircraft.

Whereas, the significant increase in mobility of ground forces requires that airborne weapons provide more mobile, rapid, accurate and intense close air support; and

Whereas, to insure that our ground forces can exercise their mobility and our close air support aircraft can adequately support them, it is imperative that we have control of the air space in tactical combat areas; and

Whereas, although in SEA we have enjoyed almost total air superiority, the Soviet Union has an Air Force which can surely challenge our ability to maintain this degree of air control in conflicts elsewhere; and

Whereas, the Soviets are exporting their first-line fighter to their East European Allies, the Middle East, and other small nations; and

Whereas, the best fighter in our current inventory, the F–4 aircraft, represents technology dating back to the mid–50s; and

Whereas, these aircraft will not be able to cope with the projected air threats of the late 1970s or early 1980s; and

Whereas, the F–15 fighter aircraft currently under development by the Air Force will possess a significant advantage in maneuverability over future enemy fighter aircraft and have a higher over-all system capability; and

Whereas, the highest priority tactical program for the Air Force for Fiscal Year 1972 is the continuing development of the F–15 aircraft; now, therefore, be it

Resolved, By the American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that the President, Secretary of Defense, and the Congress are again urged to give their full support to the Air Force on this program which will provide an air superiority fighter capable of meeting any tactical air threat of the future.

RESOLUTION NO. 275

Committee: National Security.
Subject: Airborne warning and control system.

Whereas, our air defense system has been reduced in size over the past decade to their release of air-to-ground missiles; and

Whereas, despite the fact that the Soviet bomber force has not decreased and there is clear evidence that they have developed a new swept-wing, supersonic bomber with a greater potential than our FB–111, we now have a greatly reduced interceptor force and very little detection and tracking capability; and

Whereas, our quantitative reductions were predicated upon the deployment of a more modernized and efficient air defense; and

Whereas, it is imperative that we improve our air defense capability in order to avoid a situation in which our airspace could be penetrated at will, which would free an enemy to use his entire missile force for an initial strike and then come in with bomber-carried large yield weapons at any time he chooses; and

Whereas, the key elements in a modernized air defense system are the Airborne Warning and Control System (AWACS), Over the Horizon Backscatter (OTHB) radar, and an improved interceptor to exploit fully the AWACS and OTHB capabilities; and

Whereas, the priority effort and the keystone of our modernized air defense system is the AWACS which will be equally effective and capable for both airborne battle management in CONUS air defense and in tactical combat operations; and

Whereas, the AWACS will not be vulnerable to enemy missile attack and will be able to detect enemy aircraft at any altitude out to the usable range of the radar; and

Whereas, the AWACS will be capable of directing interceptors into battle positions sufficiently removed from our borders to engage enemy bombers prior to their release of air-to-ground missiles; and

Whereas, deployment of the AWACS will enhance the survivability of the command and control elements of our defense system, improve the capability

of our current fighter-interceptors to defend against enemy bombers, and provide the control environment needed by an improved manned interceptor in the late 1970s; and

Whereas, the technical risk lies in the radar involved and two companies, are building prototypes of their radars with test flights scheduled for 1972 to determine the winning contractor; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that the Administration and the Congress are strongly urged to fully support Air Force plans to develop and deploy an Airborne Warning and Control System as an important first step in providing a modernized air defense system for the United States against attack by enemy aircraft.

RESOLUTION NO. 276

Committee: National Security.
Subject: MINUTEMAN force.

Whereas, in his Defense Report to the Congress this year, the Secretary of Defense has stated that "an effective defense of our population against a major Soviet attack is not now feasible" and "we must continue to rely on our strategic offensive forces to deter a Soviet nuclear attack on our cities;" and

Whereas, since we rely on these forces for deterrence, we must insure that they are adequate to convince all potential aggressors that acts which could lead to nuclear attack or nuclear blackmail pose unacceptable risks to them; and

Whereas, the MINUTEMAN force contributes the highest on-alert rate of all strategic forces and cannot be attacked unless the Soviets unequivocally commit themselves to high level nuclear conflict; and

Whereas, MINUTEMAN can survive a missile attack today and with planned improvements such as the Upgrade Silo program will continue to do so for the foreseeable future; and

Whereas, after completion of the Upgrade Silo program, the prelaunch survivability of the MINUTEMAN force will be improved to the point that major improvements in both Soviet guidance and re-entry vehicle systems will be required for an enemy first strike to seriously degrade the retaliatory capability of our MINUTEMAN force; and

Whereas, MINUTEMAN III is the key to continued force effectiveness as with its MIRV capability, increased penetration aids, and improved component hardness during powered flight, the MINUTEMAN III adds considerably to our assured destruction capability; and

Whereas, the Command Data Buffer program will enable numerous missiles to be updated with new information in the time currently required to update a single missile, thereby providing a wider range of options for the National Command Authority in the application of our missile force; and

Whereas, all evidence indicates that the Soviets are continuing to deploy larger, more powerful missiles to the point that it is now estimated they will have a 50% edge over us in launchers next year and an even greater advantage in total ICBM megatonnage; and

Whereas, certain members of the press, the Congress and organizations have recommended that no further improvements be made to the MINUTEMAN force alleging that such improvements are unnecessary or might be considered provocative by the Soviets; now, therefore, be it

Resolved, by the American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that the Administration and the Congress are strongly urged to fully support all actions and programs designed to improve the survivability and effectiveness of our MINUTEMAN force. For the United States to halt the improvement of this vital element of our strategic deterrent while the Soviets continue their deployment of larger, more powerful missiles will invite the threat of nuclear blackmail.

RESOLUTION NO. 358

Committee: National Security.
Subject: A–X aircraft.

Whereas, close air support has proved essential to the effectiveness of ground operations; and

Whereas, the Secretary of Defense foresees heavier demands for close air support in the future; and

Whereas, until now we have had to use multi-purpose aircraft for close support missions; and

Whereas, advances in enemy anti-aircraft systems are expected to require greater survivability of close-support aircraft if they are to be effective in the projected heavy ground fire environment; and

Whereas, such an environment may preclude the use of current gunships and helicopters even of advanced design; and

Whereas, contracts have been placed to produce prototype A–X aircraft from which a choice for production can be made; and

Whereas, the planned A–X will have excellent maneuverability, long loiter time, a large payload, high survivability, easy maintenance, short take-off distance, and will be a truly specialized close air support aircraft but will also have the capability for interdiction missions behind enemy lines, armed escort, reconnaissance, search operation and increased anti-tank effectiveness; and

Whereas, the development approach to the A–X assures a proven aircraft at reasonable cost and production can be started in Fiscal Year 1974; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we urge the Administration and the Congress to provide full support to an operational A–X aircraft for the close-support mission at the earliest possible date.

RESOLUTION NO. 331

Committee: National Security.
Subject: Safeguard anti-ballistic missile system.

Whereas, the American Legion has continually called upon Congress and the Executive Department of the Federal Government for the development and deployment of an adequate anti-ballistic missile system, designed to have the capability of giving defensive protection to a limited number of MINUTEMAN missiles; and

Whereas, the American Legion recognizes a broad margin of superiority must be maintained by the free world until peace is assured, and that the Communist goal is not military parity, but superiority; and

Whereas, the Communist countries are consistently deploying new advance weapons, such as the Frictional Orbiting Bomb (FOB), Multispectral Reconnaissance Satellites (MRS), Multiple Independent Reentry Vehicles (MIRV), improved and expanded Anti-ballistic Missile Systems, as well as increasing both physically and technically, its land and sea forces of Intercontinental Ballistic Missiles (ICBM); and

Whereas, the first phase deployment of the "Safeguard ABM System" when completed will give the Administration, in direct proportion to the external threat, the option of rapidly expanding, or halting the system entirely, as well as the ability to re-orient the system technologically should new state-of-the-art breakthroughs be encountered; and

Whereas, the American Legion firmly believes that a Safeguard Missile defense capability will make the United States' negotiating posture more flexible in arms talks, and improve the prospect for meaningful arms limitations; and

Whereas, the dimensions and magnitude of the new communist ICBM program endangers the entire national security of our country and prerequisites the speed-up of deployment on the initial phases of our Safeguard ABM system; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31-September 1, 2, 1971, that the Administration and Congress give full cooperation both financially and physically toward the rapid deployment of the basic Safeguard Anti-Ballistic Missile System, and The American Legion also urges the President and Congress take action in expediting the authorization of necessary funds for the continued advance research, development and testing, of future improved and expanded anti-ballistic missile systems.

RESOLUTION NO. 307

Committee: National Security.
Subject: Improve overseas housing for U.S. servicemen and their families.

Whereas, it has come to the attention of members of Albany Post 292, The American Legion as the result of a news broadcast on Channel 5 on January 29, 1971 at 6:30 p.m., that servicemen below the rank of Sergeant with families and

on overseas duty are forced to pay high rents for very poor housing such as apartments without heat or hot water and with very poor sanitary facilities; and

Whereas, if the Armed Forces are going to allow E–4s and below in rate to travel with their families to foreign countries, with their families transportation paid for by the servicemen, at least the families should have reasonable prices and livable housing conditions; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31-September 1, 2, 1971, that we recommend an immediate investigation be made in this matter and that our government without delay take steps to relieve those deplorable conditions which our servicemen and their families have to endure.

Resolution No. 256

Committee: National Security.

Subject: Support ROTC program at college and universities.

Whereas, the basis of our system is that every citizen who enjoys the protection of a free government owes not only a portion of his property, but even of his personal services to the defense of it; and

Whereas, there is an overwhelming necessity to teach to the rising generations discipline, patriotism, and a sense of civic responsibility; and

Whereas, since 1919, The American Legion has advocated a system of universal military training; and

Whereas, we believe that such a system of military training as nearly universal as it is humanly possible to make it would cure many of the complaints of inequalities and uncertainties in the present system, would help move toward an all volunteer regular and reserve establishment and would alleviate many of the internal ills now besetting our Nation as the best means of teaching the rising generations such discipline, patriotism and civic responsibility; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we reaffirm The American Legion's previous stand in support of the ROTC programs and urge institutions of higher learning to upgrade all ROTC programs and encourage participation in them by giving appropriate academic credit and by declaring that each participant may select military science as a minor area of concentration, should a minor be pre-requisite to graduation; and be it further

Resolved, That the Legion urges the present allowance of $50 per month to eligible participants be raised to $100 per month; and be it further

Resolved, That non-scholarship juniors and seniors be paid the same allowance; and be it finally

Resolved, That the authorized scholarships be increased from 16,000 to 34,500 and that they may be awarded to those in the 2-year program who join ROTC in their Junior and Senior years to obtain commissions.

RESOLUTION NO. 66

Committee: National Security.

Subject: Maintain a balanced conventional force for a strong national defense posture in the United States.

Whereas, the United States has a continuing interest in preserving peace throughout the world; and

Whereas, any attempt to withdraw into a policy of isolation will not remove the continuing threats which exist and events which cover in other parts of the world; and

Whereas, the present state of nuclear parity causes conventional forces to emerge as an increasingly effective means for exerting either military or diplomatic pressures; and

Whereas, nuclear weapons cannot be the answer to all hostile acts, and since the Soviets must now view nuclear retaliation as less likely, we can expect them to test our will at lower levels of conflicts; and

Whereas, we fully support the efforts to get our allies to contribute more fully to collective security through their own efforts; and

Whereas, the President has stated that "we will maintain a peacetime general purpose forces adequate for simultaneously meeting a major Communist attack in either Europe or Asia. for assisting allies against non-Chinese threats in Asia, and for contending with a contingency elsewhere;" and

Whereas, to deter communist aggression and to provide the stiffening element for strength and stability of our allies, it is essential to maintain adequate conventional forces, together with a conspicuously displayed and demonstrated ability and willingness to use them if necessary; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we support efforts to maintain balanced conventional forces adequate to meet our national strategy and to maintain a credible deterrent to aggression, especially in NATO, to provide the President with options short of an early recourse to nuclear weapons; and the flexibility to cope with a broad spectrum of conflict in other regions; and be it further

Resolved, That Congress be urged to provide funds for exercises to demonstrate the capability for rapid deployment.

RESOLUTION NO. 7

Committee: National Security.
Subject: Retired military pay.

Whereas, under the present law increases in retired pay of former members of the Armed Forces are based solely on the rate of pay received at the time of retirement; and

Whereas, those retired members that were retired on or after June 1, 1958 receive increases based on the cost-of-living price indexes according to current prices, wages, etc., rather than at a level of several years previously; and

Whereas, such increases that may actually be received according to this formula are entirely inequitable inasmuch as the amount in thousands of cases is 20% to 30% less than those just recently retired; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we endorse and support Legislation by the National Congress to assure that the retired pay of any member or former member of the Armed Forces of the United States who was on active duty or in an active duty status on or before May 31, 1958, and who became or will become entitled to receive retired pay, shall be computed at current active duty rates and increases to reflect changes in applicable current pay rates as they occur.

RESOLUTION NO. 361

Committee: National Security.
Subject: Air Force research and development program funds.

Whereas, the Air Force has no development programs for a new air defense interceptor, a replacement light intra-theater transport, an advanced tanker, or a more adequate airborne command post; and

Whereas, due to restriction on funds, the Air Force has reduced or eliminated research in fields which in the recent past provided such advances as nuclear weapons, supersonic aircraft, modern communications and computers; and

Whereas, such programs have been deferred only because of the extreme priority of the programs into which funds are being put; and

Whereas, last year the Soviet Union graduated over 160,000 engineers as against only 42,000 in the United States, which was our highest production of graduate engineers since 1952; and

Whereas, there is presumably no unemployment of engineers in the Soviet Union while there are 50,000 to 65,000 scientists and engineers unemployed in the United States due to our cutback in defense and space research and development; and

Whereas, the limitation on Air Force research and development in the current Fiscal Year is due not to the total amount allocated to the Air Force Budget but to a restriction placed by Congress on all Defense Department research and development expenditures; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we urge the Congress to lift the restrictions placed on research and development expenditures, in order to produce the advanced technology needed for national defense, to utilize the national resource represented by presently unemployed scientists and engineers, and to allow the Air Force to proceed with research and development on a new air defense interceptor, a light intra-theater transport and advanced tanker and a more adequte airborne commnd post.

RESOLUTION NO. 616

Committee: National Security.
Subject: Reserve and National Guard requirements.

Whereas, a sufficient level of military strength must be maintained to guarantee the security of our Nation against its foreign and domestic threats; and

Whereas, the Reserve Components and National Guard by law and tradition are the first lines of reserve strength for our National security forces; and

Whereas, a total force concept is being used for making the most advantageous use of all United States military forces, Active, Reserve and National Guard; and

Whereas, the Department of Defense has promulgated its policy to place increased reliance upon the Reserve Components requiring their increased readiness; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we urge the Congress and Department of Defense to provide adequate resources to fully support the increased requirements of the Reserves and the National Guard and thus recognize the increased responsibility they bear for our Nation's defense.

RESOLUTION NO. 617

Committee: National Security.
Subject: Incentives necessary to maintain strength of the Reserve components and National Guard.

Whereas, all Reserve Components are required to maintain mandatory strength levels; and

Whereas, the Departments of Defense, Army, Navy, Air Force, Marine Corps and Coast Guard have stated that high levels of mobilization readiness will be required of their respective reserve components since the National defense policy is to consider them as the first resources for augmentation of the Active Forces in future emergencies;

Whereas, Secretary of Defense Laird has recognized that the Reserve Forces and National Guard must be fully supported to produce a high degree of readiness; and

Whereas, concerted efforts are being made to reduce reliance on the draft, thus reducing its effectiveness as a motivation toward enlistment in the National Guard and the Reserve components; and

Whereas, the active forces have been given greatly increased resources and inducements to attract voluntary enlistments and to reduce reliance upon the draft; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we urge Congress and the Secretary of Defense to authorize for the National Guard and Reserve Components necessary incentives required to maintain authorized strengths during and following the transition to the zero draft.

RESOLUTION NO. 622

Committee: National Security.
Subject: Urgently needed military housing improvements.

Whereas, recent tours of the National Security Commission and Committees on various military installations have exposed deficiencies in housing and general living conditions of both enlisted personnel and some commissioned ranks; and

Whereas, current emphasis on a "zero draft" military force could be better achieved by providing better than "adequate" housing; and

Whereas, the people of the United States have no moral right to expect the military to subject its dependents to an atmosphere of substandard living conditions brought about by having to commit too great an amount of total earnings for present available facilities; and

Whereas, the current projection of scheduling of new and better facilities indicates it is not keeping pace with existing and projected needs and therefore will not enhance the ultimate desire of a dignified military image; now, therefore, be it

Resolved, By The American Legion in National Convention assembled in Houston, Texas, August 31-September 1, 2, 1971, that we urge our government to take necessary steps to upgrade housing conditions for our military and their dependents.

RESOLUTION NO. 167

Committee: National Security.
Subject: Strong national defense force in United States reaffirmed.

Whereas, the traditional United States supremacy on the high seas is being threatened by the rising Soviet Navy, plus its auxiliary seagoing adjuncts, including commercial and oceanographic vessels; and

Whereas, the diminishing strength of the United States fleet with respect to that of Russia is a threat to world peace and to the future of the United States in particular; and

Whereas, it is essential that American supremacy on the world's oceans and seaways be preserved; and

Whereas, the American Legion recognizes that in the final analysis our national survival depends on our achieving the naval strength required for strategic deterrence, control of the seas and projection of national power beyond our shores; and

Whereas, the American Legion recognizes that the achieving of that required naval strength is contingent on the provision of necessary funding, even if at the expense of domestic programs which, while highly desirable, are of lower priority than the nation's survival; now, therefore, be it

Resolved, By the American Legion in National Convention assembled in Houston, Texas, August 31–September 1, 2, 1971, that we petition the President and the Congress of the United States:

(1) to take immediate steps to return this country to its position as the world's strongest seapower and that adequate monies be appropriated to assure the swiftest possible modernization of our Navy with emphasis on nuclear propulsion;

(2) to continue a combat-ready Marine Corps with the appropriation of sufficient funds to maintain at least three full strength Divisions and three Air Wings; and to maintain a reserve strength of at least one Division and one Air Wing; and that we fully support the Administrative and operational application of the Marine Corps Division wing concept;

(3) to continue the Navy research and development program in expanding fields of science and technology for application, not only to the virtually important areas of oceanography and anti-submarine warfare, but to the end that Naval and Marine Corps forces be provided with mobility, versatility and flexibility in ships and weapons to the highest degree without reduction in readiness of the combat forces;

(4) to provide personnel support and training facilities adequate to the purpose of maintaining a high degree of readiness, morale and effectiveness;

(5) to provide the weapon systems to enable the United States Navy and Marine Corps to accomplish their assigned mission, in both conventional and nuclear warfare;

(6) to provide and permanently maintain a modern balanced amphibious assault force with a capability of projecting ashore simultaneously the assault elements of two United States Marine Corps Division Wing teams;

(7) to provide sealift capability to support the United States Army, United States Air Force and United States Marine Corps operations, which may be necessary to accomplish our national objectives;

(8) to maintain strong naval and Marine Corps Reserve Forces and supply them with modern ships, planes and equipment necessary to assure effective readiness of the naval and Marine Corps Reserve components for active duty whenever required in support of our national interests;

(9) and we call upon the Federal Government to do all things necessary to make the defenses of our nation impregnable and its offensive power so awesome that no nation or combination of nations will dare attack us.

RESOLUTION 15

Committee: National Security.

Subject: Provide adequate medical and dental care for retired members of U.S. Armed Forces, their dependents and survivors

Whereas, retired members of the uniformed services in receipt of retired pay and their eligible dependents are entitled to medical care in medical facilities of the uniformed services subject to the availability of space, facilities of their

professional staffs as determined by the cogizant medical or dental authortiy; and

Whereas, as of January 1, 1967 inpatient and outpatient care became available to certain retired members and eligible dependents at civilian facilities under the Civilian Health and Medical Program of the Uniformed Services (CHAMPUS); and

Whereas, through attrition of uniformed services facilities and increased active duty personnel workload, the aforesaid availability of space, facilities, and capabilities available to the retired member is constantly decreasing; now, therefore, be it

Resolved, By the National Executive Committee of The American Legion in regular meeting assembled in Indianapolis, Indiana, October 20–21, 1971, that appropriate action be taken, including legislation to provide adequate medical and dental care for retired members of the uniformed services, their dependents and survivors, at minimal cost to the individual.

RESOLUTION 16

Committee: National Security.

Subject: Retired serviceman's family protection plan.

Whereas, the Retired Serviceman's Family Protection Plan has proven itself neither attractive nor equitable by its low rate of participation in contrast with the Civil Service Retirement Program; and

Whereas, among all career Federal employees only the military retiree has no other system available under which he can provide properly for the dependents who survive his death from causes which are not service-connected; and

Whereas, the military retiree has served his country under depressed pay scales with little or no opportunity to create an estate adequate to care for his survivors; now, therefore be it

Resolved, By the National Executive Committee of The American Legion in regular meeting assembled in Indianapolis, Indiana, October 20–21, 1971, that appropriate action be taken, including legislation, to establish an equitable program of survivor benefits correlated to the retired pay of the military services.

RESOLUTION 17

Committee: National Security.

Subject: U.S. Coast Guard Selected Reserve.

Whereas, there is a continued movement afoot to completely abolish the Selected Reserve of the Coast Guard Reserve; and

Whereas, the Coast Guard Reserve augments the Coast Guard and in itself performs actual work and duty beyond training; and

Whereas, it fits into the overall picture of national defense which will be marred and insufficient without it; and

Whereas, doing away with the Selected Reserve of the Coast Guard Reserve is unwise and a saving that is harmful to the National Defense; now, therefore, be it

Resolved, By the National Executive Committee of the American Legion in regular meeting assembled in Indianapolis, Indiana, October 20–21, 1971, that we oppose the abolishment of the Selected Reserve of the Coast Guard Reserve, and urge the President and the Congress of the United States to provide sufficient funds to continue the Coast Guard Selected Reserve.

RESOLUTION 22

Committee: National Security.

Subject: Supplemental report of the President's Blue Ribbon Defense Panel.

Whereas, in 1969, President Nixon appointed a select group of distinguished citizens to study the workings of the United States Department of Defense and to make recommendations for its improved efficiency; and

Whereas, on July 1, 1970, this "Blue Ribbon Defense Panel" submitted its report to the President and Secretary of Defense; and

Whereas, in the course of the investigation, seven members of the panel became so alarmed about the declining ability of the United States to defend itself against the growing Soviet nuclear threat, that they prepared a "sup-

plemental statement" and submitted it to the President on September 30, 1970; and

Whereas, only after long delay by the Pentagon and the Defense Department was this report released to the public; and

Whereas, this Blue Ribbon Report, entered into the Congressional Record on April 19 (Page E3162), publicly recognizes "the abandonment by the United States of its former policy of maintaining strategic superiority," further asserts that "in the 70's neither the vital interests of the U.S. nor the lives and freedom of its citizens will be secure," and warns flatly that the "Soviet Union has attained for the first time a superior strategic capability in ICBM's where it counts most; and

Whereas, many of our most influential citizens have responded to this unprecedented national peril, not by a renewed determination to assure an adequate national defense, but rather by demands for further curtailment of defense measures which can only increase the peril; and

Whereas, the President's Blue Ribbon Defense Panel in its "Supplemental Statement" concludes that the only viable national strategy is to regain and retain a superior strategic capability by the development of new weapons and eschewing agreements which would freeze the United States into second-rate status; and

Whereas, the American Legion has always been an advocate of peace through strength and a clear-cut superiority of American military might vis-a-vis that of any potential enemy; now, therefore, be it

Resolved, By the National Executive Committee of The American Legion in regular meeting assembled in Indianapolis, Indiana, October 20–21, 1971, that the President of the United States review the warnings of the "Supplemental Report" of his Blue Ribbon Committee and bring the full weight of his office to bear upon all appropriate authorities toward the development of a military capability second to none, and, be it further

Resolved, That copies of this resolution be sent directly to the President and to all members of the Congress and that The American Legion take appropriate action to inform the American people of the inherent dangers to our national security as set forth in the Blue Ribbon Panel Supplemental Report to the end that the President and the Congress may be impelled to insure that this country regains and retains strategic superiority.

RESEARCH AND DEVELOPMENT

Mr. WILSON. While the resolutions appended to this statement cover a wide range of military requirements, all are important to the American Legion. I would like to comment specifically on a few which, at this point in time, seem to us to warrant special attention.

The first is research and development. The American Legion feels that we must maintain an overall superior technological base and a more effective R. & D. effort than any other nation. The nature of our free society demands this. By action of our most recent national convention, we urged raising of our research and development expenditures in order to produce the advanced technology needed for national defense.

We support the 9.5 percent R. & D. increase requested in the 1973 budget. We endorse the Secretary of Defense's statement that "What must concern anyone responsible for our national security is the demmonstrable fact that we could lose the technological race."

In assessing the growing Soviet R. & D.—at a rate of 10 percent per year—we must simply face the unpleasant truth that we no longer possess the superior technological base which we enjoyed for so long.

For over a decade, The American Legion has urged our leaders to develop and deploy a credible antiballistic missile system as an integral part of this nation's overall strategic deterrent. We view the continued construction of the SAFEGUARD ABM as necessary to

provide an additional level of protection for two arms of our triad defense.

Continued efforts toward SAFEGUARD ABM deployment will afford our SALT negotiators options for bargaining in the interests of international agreements. We feel it would be unwise to stop work on SAFEGUARD before an effective treaty has been agreed to for mutual reduction in weapon systems.

We feel it is well within the competency of our existing technology to deploy SAFEGUARD. Our view has been reinforced by the results of tests to date. We urge full funding be approved to assure the rapid and full deployment of the SAFEGUARD ABM system.

Another weapon system, in our view, essential to the preservation of our triad concept is the B–1 bomber. It is imperative that the $444.5 million for the B–1 bomber be approved. We feel that manned bombers will be an essential part of our triad deterrent for the foreseeable future. By convention resolution, The American Legion has urged development and procurement of the B–1 bomber by timely and adequate appropriations in the current and future fiscal years.

MINUTEMAN FORCE

Another area of vital concern to us is our MINUTEMAN force. We strongly urge the appropriations requested be approved for both R. & D. and modernization to improve the effectiveness and survivability of our MINUTEMAN force.

The previous witness, Mr. Senator and Mr. Chairman, touched upon the reserve components. And we, too, share their concern, for, as our military forces are withdrawn from Vietnam and the total manpower strengths are reduced below 2,500,000, there is a compelling need to give ever greater support to the reserve components. Even with greatly increased pay and other benefits, an all-volunteer armed force is not a certainty.

The recruitment of volunteers for the active forces has not been easy, and it will be much more difficult for the Reserves and National Guard to achieve and maintain needed manpower levels. In fact, currently, I think, they are 45,000 men short of authorized strength.

I feel that Secretary of Defense Laird has requested the funds in the 1973 budget and amply demonstrated his intention to make our reserve forces an effective part of this nation's defense, an integral component of our active military forces and our nation's defense.

In addition to the cost savings by greater reliance on the Guard and Reserves, we feel that actually relying on the citizen soldier is in keeping with the finest American tradition.

NAVAL CONSTRUCTION PROGRAM

The American Legion continues to advocate a naval construction program of sufficient size and scope to forestall obsolescence of the fleet and to enable it to successfully accomplish its assigned missions and tasks over the total spectrum of war and peace.

The United States Navy should at all times control the seas throughout the world for the protection of the interests of the United States of America for our foreign policy and the economic life lines of the free world against Communist aggression and subversion. We feel the

funds recommended by the committee will move toward that objective and certainly supplement these objectives.

Secretary of Defense Laird stated the case for adequate defense when he said, "We realize that military power by itself is not an adequate prescription for peace. But in today's world, it is an indispensable element of a strategy designed to avoid conflict." The American Legion concurs.

In conclusion, Mr. Chairman, we earnestly hope and pray for the easing of world tensions and for an era of world peace. We sincerely hope that tangible results will derive from the SALT talks and other negotiations directed toward reduced world tensions.

Yet, in the light of present world conditions, we feel America has no course other than to remain militarily strong.

On behalf of The American Legion, I thank the subcommittee for this opportunity to briefly present our views on the 1973 defense budget. Thank you.

Chairman ELLENDER. We are glad to have your views.

It just happens that I am a member of an American Legion post in Louisiana, and have been a member since I got out of in Army in 1921.

I would like to ask you your views on this subject. America is attempting to support the whole free world. It has 4½ divisions in Western Europe—and one to be sent there if necessary. I have contended that our Western allies should contribute their fair share to their own defense. So far no Secretary of Defense has been able to get our allies to do so. Thus the United States continues to carry almost the whole load.

Mr. WILSON. We agree with you 100 percent and so stated at the last national convention; we feel our allies, not only in Europe but all over the world, should assume a larger share of responsibility for free world defenses.

Chairman ELLENDER. Exactly. The record shows that ever since the first Secretary of Defense came before this committee—and I was on it—I always asked them: "What are you going to do to get our allies to provide the necessary wherewithal so that we can share more or less equally the burdens of defense?"

And they all said: "We will do all we can." But they never have been able to convince our allies to carry their share of the burden.

Of course we must provide for security, but today our forces are spread around the world, where they have been, in many instances for more than two decades. But I fear that economically we will soon be unable to continue to provide security for all the free nations of the world without getting substantially more help from our allies.

Mr. WILSON. I agree.

Chairman ELLENDER. Let me call something else to your attention. The fiscal year 1973 budget calls for appropriations of $8.7 billion for research, development, test and evaluation in the Department of Defense. This does not include the cost of pay and allowances for approximately 34,000 military personnel who are engaged in research programs. Despite this, there has been criticism that we are producing few satisfactory new weapons. I believe that, wherever possible, military personnel performing functions not related to combat activities should be replaced by civilians.

REPLACEMENT OF SERVICE PERSONNEL WITH CIVILIANS

Mr. WILSON. Yes, sir. We have no objection to affecting economies in the armed services or with replacements by civilian people.

Chairman ELLENDER. I am glad to hear that, because that has been my position throughout.

What concerns me is the fact that so many officers as well as enlisted men are engaged in programs that could be filled by civilians rather than enlisted men.

Mr. WILSON. I don't doubt that is a fact, sir.

Chairman ELLENDER. That is what we are looking into now, not with a view of reducing our security, but trying to obtain the people who are educated for civilian-type jobs to replace military personnel, who would then be released for combat-type activity, if needed.

Mr. WILSON. Right. We would endorse that 100 percent.

Chairman ELLENDER. I am sure you will. That is what I have been trying to do. We are finding out there are too many layers of personnel involved in arriving at decisions.

Mr. WILSON. Right, sir.

Chairman ELLENDER. Senator Young.

Senator YOUNG. Mr. Wilson, I want to commend you for your fine statement. It is heartening to note that the American Legion is in there fighting for a modern military force, and I am glad you share my feeling and that of many others on the committee that we should try to do this rather than police the whole world.

Chairman ELLENDER. Anything further?

Mr. WILSON. No.

Chairman ELLENDER. Thank you very much.

STATEMENT OF BRIG. GEN. PETER R. PHILLIPY, MEMBER, NATIONAL GUARD ASSOCIATION OF THE UNITED STATES

TECHNICIAN CEILING

Chairman ELLENDER. Brigadier General Phillipy is our next witness. General, you may proceed.

General PHILLIPY. Mr. Chairman, I am General Philippy, commander of an Air National Guard wing and commander of a technician detachment supporting the C–121 and the F–101 aircraft. I am here to testify for the National Guard Association in support of this program.

Although the prepared statement includes deficiencies in appropriations for construction programs and air technician subjects, I will address only the subject of air technicians.

Mr. Chairman, the National Guard Association of the United States welcomes the opportunity to make a statement before your committee and we appreciate your invitation to do so.

The technician ceiling for the ANG was established at 20,900 in fiscal year 1972 and 22,550 in fiscal year 1973 and the out years. The fiscal year 1973 authorization of 22,550 would have provided 100 percent of manning requirements based on the 1971 ANG force structure projected to end fiscal year 1973.

Since 1971, the ANG force structure has extensively changed, with modern weapons systems being added which have greatly increased

technician manning requirements; i.e., RF–84 aircraft to the RF–4 requires an increase from 160 to 263, a total of 103 technicians added in each unit. The 1973 budget constraints will impose an 88.6-percent average manning level versus the desired 100-percent manning level requirement to insure optimum support of the ANG as a modern combat-ready force. The increase in manning will equate to an increase of approximately $21.4 million in operations and maintenance funding.

The concepts of defense posturing as being implemented are proving to be so dynamic as to make the budgeting program inadequate. This association is in complete accord with these concepts and has every confidence the Air National Guard can meet changing requirements, providing corresponding recognition is given to increasing resources accordingly.

Specifically, it is our conviction that neither the number of technicians or related funding presently in the budget before you are adequate to attain and maintain the posture of military readiness expected of the Air National Guard. We therefore respectfully request that this committee act to have the Department of Defense reexamine the fiscal 1973 technician program and budget for the Air National Guard and make changes appropriate to the requirements.

In this era of the Total Force Concept, Realistic Deterrence, and the All-Volunteer Force, the Air National Guard requires added appropriations to provide adequate facilities and a sufficient number of air technicians to support our new, modern air weapons systems.

PREPARED STATEMENT

I would like to thank you, Mr. Chairman, for giving me this opportunity to present this statement for the National Guard Association in behalf of the Air National Guard.

Chairman ELLENDER. We are glad to have your statement, and I can assure you it will be brought to the attention of the committee when we mark up the bill.

General PHILLIPY. Yes, sir. Thank you, sir.

(The statement follows:)

Mr. Chairman, the National Guard Association of the United States welcomes the opportunity to make a statement before your Committee and we appreciate your invitation to do so.

We recognize that the spiraling costs of defense manpower, weapons systems and materiel are a matter of grave concern. Like the members of your Committee, we are mindful that this nation must have active and reserve military forces sufficient to guarantee its security, but that this force must be bought and paid for within certain economic confines.

While there are many areas in the Army and Air National Guard Programs where we would like very much to see additional funding which we feel necessary to assure maximum efficiency, we would like to direct the attention of the Committee to two areas where we sincerely feel there is a serious funding deficiency.

This statement will define deficiencies in the Air National Guard Air Technician and construction programs with emphasis on additional funding needed to raise Air Technician strength and modernize Air National Guard facilities to accommodate the modern aircraft which are being assigned to Air National Guard units.

The Air National Guard has a role in the national defenst structure today which is even more important than it has been in the past. In certain mission areas it is, and has been, our first line of defense of our Reserve forces, while at

the same time playing a vital role among the several States during civil disturbances and disasters.

The continuing and increasing importance of the Air National Guard is shown by the following statements of the Secretary of Defense in his FY 1973 annual Defense Department Report: (Quote)

"—We need to have National Guard and Reserves that are manned, equipped, and trained to work, on quick notice with our Active forces.—"

"—But we have only scratched the surface in utilizing the National Guard and Reserve forces in our strategy planning. We have had, over the past decade, too much talk and *too little action* in making these units combat ready—" (unquote)

With specific reference to the subject of this hearing, Mr. Laird said: (Quote)

"—Another requirement related to equipment is the availability of *adequaae facilities*. Not only must we provide secure areas for the *storage* and *maintenance of equipment* but we must also help our units to locate sites where this equipment can be put in action in live training throughout the year—" (unquote)

The technician ceiling for the ANG was established at 20,900 in FY 1972 and 22,550 in FY 1973 and the out-years. The FY 1973 authorization of 22,500 would have provided 100% of manning requirements based on the 1971 ANG Force Structure projected to end FY 1973. Since 1971, the ANG Force Structure has extensively changed with modern weapons systems being added which have greatly increased technician manning requirements; i.e., RF–84 aircraft to the RF–4 requires an increase from 160 to 263, a total of 103 technicians added in each unit. The 1973 budget constraints will impose an 88.6% average manning level versus the desired 100% manning level requirement to insure optimum support of the ANG as a modern combat ready force. The increase in manning will equate to an increase of approximately $21.4 million in Operations and Maintenance funding.

In this era of competitive military budgets, the National Guard Association of the United States suggests that proper attention and logic be focused on the inadequate facilities on a majority of Air National Guard bases. The Air National Guard, over the years, has fallen behind in construction due to austere funding. The total Air National Guard deficiency in construction is $281 million, stated in today's dollars; yet, only $10.6 million was programmed for FY '72 and only $10.6 million is programmed for FY '73. The $10.6 million is even misleading; actually, it equates to $7.7 million in FY '72 and only $4.7 million in FY '73 for major construction after planning, minor construction and *directed* pollution abatement are deducted.

Historically, the Air National Guard has fully documented construction requirements. In 1969 the Department of Defense-validated construction program based on the approved Force Structure reflected a minimum of $24.0 million for FY '72 and $24.0 million for FY '73. Over sixty percent of the Force Structure changes have occurred since 1969. Because only $10.6 million was provided for FY '72 and again for FY '73, the backlog continues to grow. Consequently, the Air National Guard is receiving modern equipment without modern facilities to meet the parameters for operations, training, maintenance, storage, security, ground safety and flying safety.

The modernization of the Air National Guard has been directed with virtually no lead time for planning, and without an increase in ANG Construction funds. This has placed a difficult burden on the National Guard Bureau and ANG units in the field. A more rapid response could result if authority for approval by the Department of Defense of minor construction, now limited to $50,000 by Section 2233A, Title 10, U.S. Code, could be raised to $200,000. The Chief, NGB, at present can approve only $10,000 projects; projects between $10,00 0and $25,000 must be submitted to the Secretary of the Army or Air Force. All $25,000 to $50,000 projects must have Secretary of Defense approval.

The limitation for the *Active Forces* on minor construction was raised two years ago from $200,000 to $300,000.

The National Guard Association of the United States requests that Section 2233A, Title 10, be amended to increase minor construction limitation to $200,000.

The constraints placed on the Air National Guard due to lack of construction appropriations, and lack of authority, already have created delays in conversions, and will continue to degrade the combat-readiness of units. Most converting units have drastic needs for avionics, training, and operations facilities. The

ANG Field Training Sites also need adequate facilities to accommodate training in modern aircraft.

The National Guardsman is much better off today in regard to pay but the attractiveness of his job is relative. Today's Air National Guardsmen should not have to train in makeshift facilities.

In this era of the Total Force Concept, Realistic Deterrence and the All-Volunteer Force, the Air National Guard requires added appropriations to provide adequate facilities and a sufficient number of Air Technicians to support our new, modern weapons systems.

Thank you for giving me this opportunity to present this statement for the National Guard Association in behalf of the Air National Guard.

STATEMENT OF SANFORD GOTTLIEB, EXECUTIVE DIRECTOR, SANE (CITIZENS' ORGANIZATION FOR A SANE WORLD)

STRATEGIC FORCE STRENGTH : UNITED STATES AND SOVIET UNION

Chairman ELLENDER. Our next witness is Mr. Sanford Gottlieb, executive director of the Citizens' Organization for a Sane World.

Mr. GOTTLIEB. Mr. Chairman, Senator Young, I am Sanford Gottlieb, executive director, and I shall try to summarize parts of my prepared statement.

The average citizen does not have to read Jack Anderson to find out what really happens in Government. One can find much basic information in the unclassified Government documents. One of the most informative is the posture statement of the Secretary of Defense. If one turns to page 40 of the fiscal year 1973 posture statement by the Secretary, one can see a very interesting comparison of strategic force strengths of the Soviet Union and the United States as of mid-1972. It indicates that by mid-1972 the United States will have 5,700 total offensive force, long-range, deliverable nuclear weapons, and the Soviets 2,500. Exactly 1 year previous, in mid-1971, the levels were respectively 4,600 for the United States and 2,000 for the Soviet Union.

This indicates to us several things: No. 1, that the United States has a lead of more than 2 to 1 in the long-range delivery weapons over the Soviet Union; and, No. 2, the gap is increasing. The United States has added 1,100 in the last year, and the Soviet Union has added 500.

Where, then, is the Soviet buildup about which we have been hearing so much for the past 3 years? Where is the Soviet momentum? There is, of course, Soviet momentum, but it cannot keep pace with the American momentum.

There is a more basic fact, I think, which emerges and has emerged for a very long time, and that is that both sides have nuclear overkill, the ability to destroy the enemy many times over, and they have had it for many years.

In 1968, Secretary of Defense Robert McNamara stated:

> In the case of the Soviet Union, I would judge that a capability on our part to destroy, say, one-fifth to one fourth of her population and one-half of her industrial capacity would serve as an efficient deterrent. Such a level of destruction would certainly represent intolerable punishment to any twentieth century industrial nation.

Secretary McNamara went on to present data suggesting that such a capability could be accomplished by a force of from 200 to 400 one-megaton nuclear warheads.

Earlier, Dr. Jerome B. Wiesner, in a special arms control issue of "Daedalus," Journal of the American Academy of Arts and Sciences, fall, 1960:

> Studies made independently by the United States Army and Navy have indicated that, even in the absence of agreements limiting force size and permitting inspection, 20 relatively secure missiles would provide an adequate deterrent.

What Dr. Wiesner was saying almost 12 years ago and what Secretary of Defense McNamara was saying almost 4 years ago was, we long since passed a point where we had an effective deterrent and that we were simply adding overkill to overkill.

You gentlemen are being asked this year to appropriate over $17 billion for more strategic weapons if one includes in the request your intelligence and communications, research and development, supplies, maintenance, training, and so on.

And we would specifically urge you to reject funds for the deployment of further MIRV's and the development of the B–1 bomber and the underwater long-range missile system until such time as the Defense Department can make a convincing case for a strategic force of more than 5,700 nuclear warheads, strategic nuclear warheads, when 200 to 400 could destroy over 70 million Soviet people.

Moreover, we urge no funds be appropriated for expansion of the highly questionable and extremely costly ABM system, one of the generators of the mad momentum of the armed services.

GENERAL PURPOSE FUND

Turning now to general purpose forces, the Nixon administration is seeking funds for 2,385,000 active duty military personnel. They will be stationed in 3,000 bases in Asia, Europe, and Latin America as well as in the United States. This country is publicly committed to military alliances with 48 nations. In addition, there are secret military commitments to other nations, including Ethiopia and Laos.

The United States has assigned approximately 310,000 men to NATO. The NATO alliance is well prepared in case of attack. According to Senator George McGovern's Alternative Defense Posture—summarized in the Senate on January 24, 1972—NATO has a total of 794,000 men in central Europe against 685,000 Warsaw Pact forces. NATO has 2,100 aircraft against 2,900 Warsaw Pact aircraft. However, a larger percentage of the Warsaw Pact planes are defense-oriented than are the NATO planes. Both sides have large numbers of tanks, artillery, and antitank weapons. Substantial numbers of American troops and planes can be shifted quickly to central Europe in case of conflict.

There is no need to keep 310,000 American troops and their dependents in Europe. Many of them could be returned to their bases in the United States, resulting in substantial savings. The Administration opposes any such thinning-out in central Europe on the grounds that it would hinder the negotiation of mutual balanced force reductions.

Since these proposed negotiations are likely to be exceedingly complex—the opposing forces being asymmetrical in geographic position and types of military strength—this logic could lead to an unchanging American military presence in Europe for the better part of the 1970's.

Turning to Asia, when one compares the number of men available

to the United States and its allies in Asia, one sees a total of 3,344,000 against Communist forces of 3,412,000. In short, there is virtual manpower parity of Communist and non-Communist forces in Asia.

However, the United States has assigned roughly half of its Navy as well as nuclear weapons and assigned 1,200 combat planes to the Asian theater, providing vastly superior conventional and nuclear fighter power and transport.

On the other side, one sees China, a nation with 800 million population and an army of 2½ million, barely larger than ours, composed of men and women, many on the Soviet border and others working at civilian tasks, and coastal navy forces only, and older model fighter planes.

We submit to you, gentlemen, China has been a highly overrated threat for two decades. In view of the United States and allied superiority in fighter power and transport, the current political situation, including the process set in motion by President Nixon's visit to China, and the geographic factors, there is no excuse for keeping half of the Navy and a large segment of our air power in Asia, nor is there need for U.S. troops in South Korea when that country has achieved military superiority over the North.

Secretary Laird's 1973 posture statement indicates that the United States is planning for a Navy of 652 ships, including 16 aircraft carriers. Senator George McGovern has placed the number of Soviet ships at 566, plus some smaller craft. The Soviet Union, as is well known, has no aircraft carriers.

The U.S. Navy has been pressing vigorously for several years to secure a larger slice of the military pie. Early in 1969, upon visiting a freshman Senator, I first learned that Navy lobbyists were already informing Members of Congress how the Navy had been starved by the Vietnam war. Today, the Navy is not only trying to overcome its so-called lean days but also striving to move into vast new areas.

The quotation I have in the prepared text from Michael Getler of the Washington Post on March 18 goes into this is some detail, and I won't take time here to quote anything but the last paragraph. Mr. Getler's article concludes:

> The Navy situation has produced added strain among the services because it is widely assumed that Congress will force some leveling off in defense spending and that choices will have to be made.

We agree. Choices will have to be made. We hope they will be made by this committee. We hope they will be made not just through the military-minded assumptions of the cold war but by a realtistic assessment of the threats to American national security.

I would like to spend a moment on what are the threats.

At the military level, only one nation, the Soviet Union, has the military capability of attacking and destroying the United States. However, there is nothing the Soviet Union could do to prevent its own society from being wiped out if it were so rash as to attack the United States. That defines a state of deterrence. It has long since been achieved. There is no military advantage obtained in deploying additional nuclear weapons.

Yet, national security is not assured by military means alone. As Dwight Eisenhower wrote in an article, "Spending into Trouble," the Saturday Evening Post, copyright 1963:

For a moment let's think of national security and its costs. A key point to keep in mind is this: No matter how much we spend for arms, there is no safety in arms alone. Our security is the total product of our economic, intellectual, moral and military strengths.

When 6 percent of the American labor force is without jobs, when Life magazine can devote its cover story to "The Cities Lock Up: Fear of Crime Creates a Life-Style Behind Steel," November 19, 1971, when the New York Times can report from Iowa, "Rural Crime Spreads Fear and Distrust," January 16, 1972, when the Cowgill-Reynolds Co. of Alexandria, Va., can send advertisements to the residents of the Washington area urging the purchase of "the only chemical spray using CS" gas, which "instantly disables one or a gang of attackers for 10 to 15 minutes," then something is so seriously wrong with the American society that we had better attend to some of the threats at home. Otherwise, we may not have a society to defend by the end of the 1970's. It was not, after all, Soviet missiles or Chinese soldiers which caused American cities to burn in the late 1960's.

Money alone cannot cure the threats which come from desperate, hopeless, or drug-ridden Americans. But, without money, nothing can be done to address the problems which afflict a sizable segment of the American population. Nor can anything be done to meet the huge backlog of public needs shared by Americans in less acute circumstances.

POSSIBLE TRIMMING OF BUDGET

We were delighted when the Senate Appropriations Committee held the first in its annual series of hearings on national goals and priorities. We now urge the committee to act upon the information which emerged from these hearings. This can be done by making major cuts in the proposed military budget, in the hope that Congress will transfer the savings to civilian programs needed by all Americans.

Thank you, Mr. Chairman and Senator Young.

(A statement follows:)

PREPARED STATEMENT

Chairman ELLENDER. Thank you very much, Mr. Gottlieb. Your prepared statement will be inserted in the record at this point.

The average citizen does not have to read Jack Anderson to find out what really happens in government. One can find much basic information in the unclassified government documents. One of the most informative is the "Posture Statement" of the Secretary of Defense.

Secretary Laird's "Posture Statement" for Fiscal Year 1973 contains on Page 40, for example, a comparison of strategic force strengths of the Soviet Union and the United States as of mid-1972. At that time, the United States will have 5,700 total offensive force loadings the USSR, 2,500. One year earlier, in mid-1971, the respective numbers stood at 4,600 and 2,000.

These statistics reveal a number of important facts about the nuclear deterrence of the two super-powers. First, the United States has a lead of more than two to one over the Soviet Union in strategic nuclear weapons. Second, the gap is increasing, to the benefit of the United States. The United States will have added 1,100 strategic weapons to its stockpile within the past year, with the Soviet Union adding only 500.

Where then, is the Soviet Union's "build-up"? Where is the Soviet Union's "momentum", about which we have heard so much from the Defense Department in the past three years? There is, of course, Soviet momentum, but it cannot keep pace with that of the United States.

There is another fact revealed by these statistics, one that is all too rarely

introduced in congressional discussions of the military budget. That fact is: *Both super-powers have long since achieved nuclear overkill.* In February, 1968, in congressional testimony on an adequate nuclear deterrence for the United States, Secretary of Defense Robert McNamara stated, "In the case of the Soviet Union, I would judge that a capability on our part to destroy, say, one-fifth to one-fourth of her population and one-half of her industrial capacity would serve as an effective deterrent. Such a level of destruction would certainly represent intolerable punishment to any 20th-Century industrial nation." Secretary McNamara went on to present data suggesting that such a capability could be accomplished by a force of from 200 to 400 one-metagon nuclear warheads.

Earlier, Dr. Jerome B. Wiesner wrote in a special arms control issue of "Daedalus," Journal of the American Academy of Arts and Sciences (Fall, 1960): "Studies made independently by the United States Army and Navy have indicated that, even in the absence of agreements limiting force size and permitting inspection, 200 relatively secure missiles would provide an adequate deterrent."

The conclusions reached in the Army and Navy studies and by Secretary McNamara were based no doubt on the elementary fact that each of these weapons could wipe out a city, and that the Soviet Union has 175 cities with populations of 100,000 and over. We have gone far beyond any rational notion of nuclear deterrence in the last decade. Still not content, we will double the size of our nuclear arsenal through the deployment of MIRV's in the next few years. Dr. Herbert Scoville, Jr. stated it succinctly in *The New Republic* (March 25, 1972): "This is not security. This is insanity."

Your Committee is being asked to appropriate about $17.7 billion for strategic weapons (including intelligence and communications, research and development, supply, maintenance, training, etc.), adding overkill to overkill. We urge you to halt funds for the deployment of MIRV, and the development of the B–1 bomber and the Underwater-Long-Range Missile System until such time as the Defense Department can make a convincing case for a strategic force of more than 5,700 nuclear warheads—when 200 to 400 could destroy over 70 million Soviet people.

Moreover, we urge that no funds be appropriated for expansion of the highly questionable and extremely costly ABM system, one of the generators of the mad momentum of the arms race.

GENERAL PURPOSE FORCES

The Nixon Administration is seeking funds for 2,385,000 active-duty military personnel. They will be stationed in 3,000 bases in Asia, Europe, and Latin America as well as in the United States. This country is publicly committed to military alliances with 48 nations. In addition, there are secret military commitments to other nations incluuding Ethiopia and Laos.

The United States has assigned approximately 310,000 men to NATO. The NATO alliance is well prepared in case of attack. According to Senator George McGovern's Alternative Defense Posture (summarized in the Senate on January 24, 1972), NATO has a total of 794,000 men in Central Europe against 685,000 Warsaw Pact forces. NATO has 2,100 aircraft against 2,900 Warsaw Pact aircraft. However, a larger percentage of the Warsaw Pact planes are defense-oriented than are the NATO planes. Both sides have large numbers of tanks, artillery and anti-tank weapons. Substantial numbers of American troops and planes can be shifted quickly to Central Europe in case of conflict.

There is no need to keep 310,000 American troops and their dependents in Europe. Many of them could be returned to their bases in the United States, resulting in substantial savings. The Administration opposes any such thinning-out in Central Europe on the grounds that it would hinder the negotiation of mutual balanced force reductions. Since these proposed negotiations are likely to be exceedingly complex—the opposing forces being asymmetrical in geographic position and types of military strength—this logic could lead to an unchanging American military presence in Europe for the better part of the 1970's.

It is in Asia, however, that a much clearer case exists for the reduction of general purpose (as well as strategic) forces. American and Allied forces in Asia surround China by land, sea and air. The non-communist forces match the Chinese and other Asian communist armies in manpower, and deploy much more firepower.

U.S. and Allied Forces in Asia (3,344,000)

U.S.—400,000 men,[1] 1,200 combat planes, roughly half of navy, nuclear weapons, vastly superior conventional firepower and transport.
Taiwan.—500,000 men.
Indo-China.—1,500,000 men.
South Korea.—570,000 men.
Japan.—250,000 men.
Australia.—69,000 men.
New Zealand.—13.000 men.
Philippines.—38,000 men.
Malaysia.—4,000 men.

Communist Forces in Asia (3,412,000)

China.—2.5 million men and women, many on the Soviet border and others working at civilian tasks. Coastal naval forces only. Older-model fighter planes.
Indo-China.—542,000 men.
North Korea.—370,000 men.

In addition to their armed forces, most of the nations allied with the United States are protected by geography. Three other Asian countries which have either used their military forces against each other (India and Pakistan) or to quell internal dissension (Indonesia) have sizable armies which can be used to protect themselves against any Chinese attack. According to *The New York Times*, India has 828,000 and Pakistan 300,000. Indonesia has an army of some 350,000.

In view of United States and Allied superiority in firepower and transport, the current political situation, and geographic factors, there is no excuse for keeping half of the Navy and a large segment of our airpower in Asia.

Naval Forces

Secretary Laird's 1973 "Posture Statement" indicates that the United States is planning for a Navy of 652 ships, including 16 aircraft carriers. Senator George McGovern has placed the number of Soviet ships at 566, plus some smaller craft. The Soviet Union has no aircraft carriers.

The United States Navy has been pressing very vigorously for several years to secure a larger slice of the military pie. Early in 1969, upon visiting a freshman Senator, I first learned that Navy Lobbyists were already informing Members of Congress how the Navy had been "starved" by the Vietnam war. Today, the Navy is not only trying to overcome its so-called lean days, it is also striving to move into vast new areas. According to Michael Getler in *The Washington Post* of March 18, 1972: ". . . This year's Navy budget includes funds for a start on the first of eight new mini-aircraft carriers called sea control ships; the first of 50 new patrol frigates designed to replace destroyer escorts; two new hydrofoil gunboats, and experimental air cushion vehicles.

"But Zumwalt has not given up any of the Navy's traditional pursuits. The Navy wants to start work this year on a fourth nuclear-powered aircraft carrier, the world's first billion-dollar ship, and wants another billion dollars for the new ULMS missile-firing submarine. It will step up attack submarine production and is thinking of asking for still another new submarine project, this one carrying cruise missiles to attack surface ships.

"On top of all this, the Pentagon budget is still paying off massive destroyer modernization programs started a few years ago, which are experiencing large cost overruns. And the Navy's new carrier-based F–14 fighter is costing far more than planned.

"The Navy situation has produced added strain among the services because it is widely assumed that Congress will force some leveling off in defense spending and that choices will have to be made."

We agree. Choices will have to be made. We hope they will be made by this Committee. We hope they will be made not just through the military-minded assumptions of the cold war, but by a realistic assessment of the threats to American national security.

What Are the Threats?

At the military level, only one nation—the Soviet Union—has the military capability of attacking and destroying the United States. However, there is nothing the Soviet Union could do to prevent its own society from being wiped

[1] Includes divisions in the U.S. assigned to Asia.

out if it were so rash as to attack the United States. That defines a state of deterrence. It has long since been achieved. There is no military advantage obtained in deploying additional nuclear weapons.

Yet, national security is not assured by military means alone. As Dwight Eisenhower wrote in an article, "Spending into Trouble" (*The Saturday Evening Post*, copyright 1963): "For a moment let's think of national security and its costs. A key point to keep in mind is this: No matter how much we spend for arms, there is no safety in arms alone. Our security is the total product of our economic, intellectual, moral and military strengths."

When 6% of the American labor force is without jobs; when *Life* Magazine can devote its cover story to "The Cities Lock Up: Fear of Crime Creates a Life-Style Behind Steel", (Nov. 19. 1971); when *The New York Times* can report from Iowa, "Rural Crime Spreads Fear and Distrust" (January 16, 1972); when the Cowgill-Reynolds Company of Alexandria, Virginia, can send advertisements to the residents of the Washington area, urging the purchase of "the only chemical spray using CS" gas, which "instantly disables one or a gang of attackers for 10 to 15 minutes—then something is so seriously wrong with the American society that we had better attend to some of the threats at home. Otherwise, we may not have a society to defend by the end of the 1970's. It was not, after all, Soviet missiles or Chinese soldiers which caused American cities to burn in the late 1960's.

Money alone cannot cure the threats which come from desperate, hopeless or drug-ridden Americans. But without money, nothing can be done to address the problems which afflict a sizable segment of the American population. Nor can anything be done to meet the huge backlog of public needs shared by Americans in less acute circumstances.

We were delighted when the Senate Appropriations Committee held the first in its annual series of hearings on national goals and priorities. We now urge the Committee to act upon the information which emerged from these hearings. This can be done by making major cuts in the proposed military budget, in the hope that Congress will transfer the savings to civilian programs needed by all Americans.

POSTURE STATEMENT

Chairman ELLENDER. I am very much interested in the figures you gave a while ago in respect to our missiles and other defensive and offensive weapons. What is the source of your figures?

Mr. GOTTLIEB. This is a very informative booklet I hold here called National Security Strategy of Realistic Deterrents, Secretary of Defense Melvin Laird's annual defense report for the year 1973, properly known as the posture statement. And if one turns to page 40 of the posture statement, one sees a chart "Strategic Force Strengths," and there are two dates listed, one November 1, 1971, and I have not used that figure, but I used the projection to mid-1972, and mid-1972 shows that we expect to have 5,700 long-range strategic nuclear warheads, and the Soviets 2,500.

The last year's posture statement by Secretary Laird indicated that the United States, by mid-1971, was expected to have 4,600 and the Soviet Union 2,000.

Chairman ELLENDER. I did not realize that Secretary Laird included those figures in his unclassified statement. I recognized them, but during his appearance before the committee we used the classified statement. I am pleased that he has included them in the unclassified version.

Testimony that we obtained from Defense witnesses indicates that the Soviet Union seems to be progressing more rapidly than we are, and you indicate just the contrary.

Mr. GOTTLIEB. I think those witnesses can talk about only one out of three kinds of delivery systems of nuclear weapons. They tend to

concentrate their fire on land-based missiles, where, indeed, the Soviet Union has gone somewhat ahead of the United States, but they failed to talk about the submarine-launched missiles, they failed to talk about the enormous lead in hydrogen weapons that are carried by strategic bombers, a lead possessed by the United States, and 5,700 is a total figure for the entire triad.

Chairman ELLENDER. In any event, I will present your figures to Mr. Laird——

Mr. GOTTLIEB. This is his statement, sir.

Chairman ELLENDER (continuing). And ask for comments.

Mr. GOTTLIEB. Thank you, Mr. Chairman.

STATEMENT OF MARVIN L. GOLDBERGER, CHAIRMAN, FEDERATION OF AMERICAN SCIENTISTS

ACCOMPANIED BY HERBERT SCOVILLE, MEMBER, STRATEGIC WEAPONS COMMITTEE

POTENTIAL HAZARD TO MINUTEMAN FORCE

Chairman ELLENDER. The next witness will be Mr. Marvin L. Goldberger, chairman, the Federation of American Scientists.

Mr. GOLDBERGER. It is a privilege to again have the opportunity to address this committee on behalf of the Federation of American Scientists. I have here with me, on my left, Dr. Herbert Scoville, who is a member of the Federation of American Scientists; Strategic Weapons Committee, and he will be only too willing to help answer questions.

Chairman ELLENDER. We are glad to have you with us, Mr. Scoville.

Mr. GOLDBERGER. You may recall that during our testimony last year we pointed out that allegation by the Department of Defense that the discovery of about 100 new Soviet silo starts constituted a great new potential threat to our Minuteman force was greatly exaggerated.

In fact, on the day we testified, it was revealed that, in fact, the bulk of these new excavations were in the SS–11 fields and not among the SS–9's.

The plausible explanation that these sites represented perhaps improved silo hardening rather than the introduction of an entirely new missile system was suggested at this time. We also emphasized that all available evidence pointed to the fact that no true Soviet MIRV either had been or was under development and that consequently the Minuteman force was not jeopardized by the Soviet strategic forces.

It is gratifying that in a statement during the past week Dr. John Foster now agrees with our analysis of a year ago. I will return to that later in my statement.

STRATEGIC FORCES

Most of our testimony is concerned with strategic forces. General concern about the adequacy of U.S. strategic forces began in 1969, when the Administration changed the rationale for the ABM and began to argue that our deterrent was sufficiently in danger to require an ABM to protect land-based missiles.

Thus, in 1969, the Defense Department argued that the anticipated threat to our deterrent required urgent efforts to build the SAFEGUARD ABM, to deploy MIRV on land and sea, and to build a new—B–1—bomber.

But since that time, the threat to our deterrent has not kept pace with the Defense Department projections. Because of this and because of the actions already taken since 1969 to strengthen our ability to retaliate, the U.S. ability to destroy Soviet population and industry after a Soviet attack continues to climb beyond any necessity.

As a direct result of this enormous retaliatory capacity, the Defense Department submission this year has been able to produce only the vaguest threat analysis in many years. In effect, it emphasizes political or wholly speculative reasons for continued U.S. strategic force procurement. The reason for this is clear:

Our strategic force decisions are overreacting to such Soviet weapon possibilities as an ABM far behind the predictions of a few years ago and about to be definitely limited to low levels by treaty; a MIRV whose tests have not begun and are long delayed; an improved bomber defense unlikely ever to be built; and a now insignificant antisubmarine warfare capability that would require unforeseeable technological developments even to be a problem.

The antidote to this tendency is to approve systems less readily. The United States has built up such an enormously powerful retaliatory ability that it can move slowly and cautiously in committing itself to further strategic forces with the skyrocketing costs they involve. We can wait to see that a strategic response is necessary. We can wait until we know what response we want to make.

PROJECTIONS OF DEFENSE DEPARTMENT

The Threat Has Not Kept Pace with Projections: In 1969, the Defense Department projected a Soviet SS–9 force growing at 50 SS–9's a year, armed with a true MIRV to be developed in the "next few years" and a Soviet ABM, or a bomber defense, that could destroy retaliating U.S. Polaris warheads.

But in the two years since August 1969—when the Soviet Union had more than 275 SS–9's operational or under construction—and February 1972—when the Soviets are said to have about 300 SS–9's or other large launchers—there have evidently been started only about 25 large launchers. Thus the rate in the last two years has been 20 percent of that predicted originally.

This year, Secretary Laird reported "very little construction" on the standard SS–9, SS–11, and SS–13 missiles. He noted only the start of construction on 100 different-type silos for which no new missile has yet been tested, and it has been suggested elsewhere that about a third might be for large missiles. These new large launchers are included in the 300 mentioned above. Thus the Soviet land-based missile buildup shows many signs of tapering off.

What about Soviet MIRV? Although in 1969, the Administration reported that the Soviets had been testing for a year an MRV system which had a footprint which threatened our Minuteman deterrent, this year the Defense Department admits that the last MRV Soviet tests were in late 1970—more than a year ago. General Ryan testified

last March that such MRV's were no threat to Minuteman. Secretary Laird now says the Soviets "have probably not tested any MIRVed missiles thus far."

Since it took the United States two years from its first MIRV test to initial deployment in June 1970, an initial deployed Soviet MIRV ought not be expected until 1974, even if a Soviet MIRV test occurred tomorrow. This would not be the "few years" predicted in 1969 but five years, and a threat to Minuteman would be much longer.

Indeed, only three days ago, on March 21, the Administration was forced to make further concessions about the slow rate of growth of the Soviet threat to Minuteman—concessions nowhere evident in the Defense Department posture statement provided Congress only one month ago on February 15.

On the occasion of an executive hearing of the Armed Services Committee in which Dr. Wolfgang K. H. Panofsky confronted Dr. John S. Foster in secret debate, the latter released an unclassified statement which stated that the Soviet ICBM program appeared to be greatly slowed. Even the new silo construction may be only to attain a higher level of hardness.

The failure of the Soviets to test the three-warhead system since late 1970 suggests the Soviets "may have canceled or curtailed" the SS–9 triplet program. If this has been done in favor of a new Soviet missile, which might go in the new silos, then the projected threat to Minuteman is still further in the future. He summarized the threat to Minuteman as follows:

1. If small Soviet force growth is assumed, Minuteman forces do not appear threatened "until the early 1980's or beyond." The Foster statement earlier suggested that growth in SS–9 and SS–11 seems to have stopped.

2. For middle-range assumptions, Minuteman could have "less [sic] survivors in 1980 or before." Nowhere was there any indication of what "less" related to.

3. The most pessimistic assumptions suggested that Minuteman "could be drawn down" as early as the mid 1970's. But Minuteman can be "drawn down" today. These empty phrases indicate the problems DOD drafters of these statements have in continuing to suggest a serious threat.

In a case like this, where the most pessimistic projections are becoming less likely and have to be stretched to suggest any concern, it is not sensible to spend large funds in response to them. After all, Minuteman is a backup strategic system, not our only one. We have spent tens of billions of dollars to provide enough redundancy to our strategic force to make unnecessary an immediate response to every new technical threat possibility to some single part of our force.

In any case, no surprise attack is possible without an ABM. What about this critical element in any theoretical surprise attack—the Soviet ABM which would shoot down the retaliating U.S. missiles that were not destroyed in an initial attack, including especially the Polaris missiles? It doesn't exist. The Moscow ABM continues to be of negligible importance and cannot even protect Moscow.

Admiral Moorer recently testified that "the Moscow ABM with improved radars and more and better interceptors could still be saturated by a very small part of our total missile force." The massive Soviet

ABM is not being built. And there is every likelihood that we and the Soviets will preclude it by SALT agreement.

The fiscal 1973 posture statement concedes "general agreement" that the SA–5 Soviet air defense system is "not presently intended" for missile defense, with only "some technical experts" concerned that it might "possibly be adapted" for such use.

SURVIVABILITY OF POLARIS SUBMARINES

Finally, and of major importance, the estimates of the survivability of Polaris submarines against any Soviet anti-submarine warfare capabilities continue to be "highly survivable."

From the point of view of the threat to our deterrent, the considerations listed above are by Secretary Laird's own standards the critical ones: the lag and tapering off of SS–9's and other large missiles, the complete failure of a Soviet MIRV to make its appearance, and, especially, the nonconstruction of a massive Soviet ABM.

From the point of view of protecting our confidence in our deterrent, the continued buildup in SS–11's, which has now also tapered off, and the large increase in Soviet submarine-launched missiles, is of far less significance.

The recent numerical increase in Soviet land- and sea-based launchers should not be allowed to obscure these critical facts. Our problem is to keep our deterrent secure, not to worry about every change in Soviet force structure per se.

Meanwhile, what has the United States done to maintain its retaliatory ability? The United States has emplaced MIRV warheads on both land and sea missiles. A program for the retrofitting of Polaris to Poseidon missiles has already increased by several times the security of the Polaris system as a whole.

After all, a single MIRVed Polaris submarine can deliver 160 warheads, each several times the yield of the Hiroshima bombs, more quickly, surely, and credibly than could have been assured by our entire deterrent in the fifties. Also, by MIRVing one-half of the Minuteman force with three large warheads, we are enlarging the Minuteman force by a sizable factor.

In short, although, in its most important quantitative and qualitative aspects, the Soviet offensive and defensive threat to Minuteman and Polaris has not emerged, the U.S. program of responses to the projected threat has gone forward anyway. These responses include not only MIRV but several billion dollars of Safeguard ABM. Now we are proposing, in addition, to go ahead on a large scale with ULMS, the B–1 bomber, and several other strategic systems.

No Surprise Attack Scenario Has Been Proposed: As a result of the slowing down of the Soviet programs and the U.S. forces already in being, the Defense Department posture statement finds it difficult indeed to make a persuasive scenario in which a Soviet threat to our retaliatory ability exists.

The plausibility of threats to our deterrent has decreased rapidly in the last decade. In the late fifties, we feared a missile attack upon bomber bases which would, in principle, have disarmed us and destroyed our bomber-based strategic deterrent—if it could have been done in timely fashion, with the destruction of other carrier-based and European-based alert nuclear weapons.

By the mid sixties, the Soviet surprise attack planner not only had to destroy bombers on the ground but also land-based missiles. Most incredible of all, he had to rely upon an untested ABM, which then was only beginning to be deployed, to shoot down these undestroyed and retaliating "residual" U.S. missiles which would have included hundreds based on Polaris submarines.

No sane American planner would have relied upon a U.S. ABM for this purpose. And the Soviets had then—and still have—only a small, ineffective ABM around Moscow and a bomber defense system which, as is universally agreed, is not designed for shooting down U.S. missiles at all.

Today, the Defense Department does not even suggest a surprise attack scenario. It puts forth no particular way in which the planned several thousand U.S. independently targetable alert warheads could be destroyed. It talks of some particular problems with different arms of our strategic force. But it makes no effort to suggest that, overall, we are in any way threatened in strategic terms.

Instead, it talks vaguely of "technological surprise," of Soviet "momentum," and of showing the Soviet Union that we have the "will and the resources" to match them in numbers of missiles.

In summarizing our conclusions on strategic forces, we want to emphasize our view that the United States characteristically has responded prematurely to exaggerated threats as if money were no object. The Defense Department has implicitly assumed that further funds will be available if the threat turns out to be different than projected. And it has also assumed implicitly that the United States can always afford to respond immediately without waiting.

As examples, we note that the United States is deploying MIRV years after the posture statements have admitted that the Soviet ABM that MIRV was designed to overwhelm is not coming into being. The United States has deployed the A–3 Polaris missile in place of the A–1 and has then gone on to retrofitting with the Poseidon, without observing any significant threat to Polaris in this time frame that required the additional range or warheads.

COMMITTAL TO B–1 BOMBER

The United States is now almost committed to a new strategic B–1 bomber, justified in large part in response to projected Soviet air defense improvements of 10 or more years off, improvements it is now very plausible to expect will never arise—and which make little difference in any case.

Finally, the Defense Department was prevented, only with enormous difficulty, from winning congressional approval for an anti-Chinese portion of the Safeguard ABM. Three years later, the Chinese have still not tested an ICBM, and there are increasing doubts that they will move in this direction in the near future.

In short, the Defense Department has a tradition of squandering U.S. resources; its rationalizations insist on insuring and reinsuring the U.S. strategic posture by calling attention to threats which are not yet compelling or even developing. The motivation is overzealousness and also the never-ending pressures for technological innovation and modernization of forces which the Defense Department will always seek as an end in itself.

In connection with these tendencies and others, we have these general recommendations:

1. The Defense Department should be asked to state what requirements for deterrence it is seeking to fill—in terms of population and industry to be destroyed in retaliation—and how programed and proposed U.S. forces are fulfilling that objective.

2. The Defense Department should be asked to distinguish between the forces that it is requesting primarily for international—or domestic—reasons and those being requested primarily for strategic military reasons.

3. The Defense Department should be required to release much more information about projected costs and numbers of its proposed forces. This material is kept classified simply and solely to prevent public criticism of DOD proposals.

4. The Defense Department should be sharply restrained from pursuing its policy of selective release of partially digested intelligence information. The Defense Department is not playing fair with the public or Congress when it suppresses facts about Soviet slowdowns and releases only what helps the DOD case.

Mr. Chairman, we have summarized a series of eight programs, strategic weapons programs, that we believe it would be possible to save about $6 billion on, approximately equivalent to the total increase which Secretary Laird is seeking in his budget request. I do not propose to go through those in detail but would be happy to answer questions about them.

In conclusion, I would like to say that I think it is especially important, in view of the likely possibility of a SALT agreement, that all of the aspects of the defense budget should be reviewed if a successful agreement is, in fact, to be concluded. Thank you.

Chairman ELLENDER. Doctor, do you believe there is any chance of the SALT talks being agreed to?

Mr. GOLDBERGER. I don't know anything at all beyond what I read in the newspapers and occasional smiles on the faces of my friends. I am optimistic that some sort of agreement will be reached at the time of Mr. Nixon's trip to Moscow.

Chairman ELLENDER. I express that same hope. I think that he will be on his way in May, and I am very hopeful that something can come out of that meeting. It hardly makes any sense for us and the Soviet Union to be in a continual arms race as we are unless it is based on realism. We talk about a Soviet threat, and it may be there, but it is my own sincere belief that the people of Russia want war no more than the people of the United States. I am very hopeful that something can be done in some way to prevent this arms race that is going on between us and the Soviets.

Mr. GOLDBERGER. I might say one more thing, Mr. Chairman. Although I am optimistic about the SALT talks, I wouldn't want to give the impression that I would subscribe to some sort of all-out military buildup if there were no SALT agreement at this time. As I have attempted to emphasize in our statement here today, we have a more than adequate strategic deterrent force, and there is no reason to panic at this time.

Chairman ELLENDER. The policy being advocated by the Defense Department, is that, although we are living in an age of atomic

missiles, we must, by all means, continue to prepare for all types of warfare. That is one of the main theses they present to us. They have testified that the arms buildup is necessary as a deterrent and in case there is a large war.

This committee will consider all that you and others have said before we mark up the bill.

Senator YOUNG. Mr. Chairman. Dr. Goldberger, is there any part of the Defense Department weapons modernization program of which you approve? Do you approve of any part of their modernization of weapons programs?

Mr. GOLDBERGER. I would prefer to confine my remarks to the strategic weapons area and not try to say anything about anything else.

Senator YOUNG. Your whole statement was in opposition to everything and improving nothing.

Mr. GOLDBERGER. I dislike being placed in such a position, but I am afraid I have to agree.

Senator YOUNG. Thank you.

Mr. GOLDBERGER. It is not that I don't like to improve things, but I think our current forces are quite good and quite adequate and that we are taking necessary steps to protect the country already.

Chairman ELLENDER. Thank you very much, Doctor.

Is there anyone else present who wishes to be heard?

LETTER FROM MRS. WALTER G. KIMMEL, COORDINATOR OF LEGISLATIVE ACTIVITIES, NATIONAL CONGRESS OF PARENTS AND TEACHERS

Mrs. Walter G. Kimmel, Coordinator of Legislative Activities of the National Congress of Parents and Teachers has written to the committee, providing an expression of views on overseas dependents' schools. The letter will be made a part of the record at this point.

(The letter follows:)

NATIONAL CONGRESS OF PARENTS AND TEACHERS,
March 22, 1972.

Hon. ALLEN J. ELLENDER,
Chairman, Committee on Appropriations,
U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: On behalf of the National PTA and its overseas branch, the European Congress of American Parents and Teachers, we should like to request particular consideration for the needs of the overseas dependents schools. Our concern is based not only on the fact that the children of almost 50,000 of our membership of approximately ten million attend these schools, but also in that the welfare of the schools is extremely important to all families of servicemen overseas.

We greatly appreciate your long concern for the overseas dependents schools, but there are still areas of need. Due to lack of facilities, there is stiill overcrowding in the classrooms in Frankfort and other areas. Heating, lighting and ventilation are inadequate in some buildings. Facilities are lacking for kindergarten.

There is need for funds to develop a program in career education. It is hoped that such a program could be developed within the school system, apart from the facilities of the military. Just as in the states, many of these children are not college bound and need the opportunity to develop a saleable skill. These children do return to the states to live and need to be prepared to live in the surroundings in which they find themselves.

Drugs are a problem there just as they are here and there is need for programs in drug education. In order to accomplish this, it is suggested that a drug coordinator in each district would be helpful.

Since twenty-five per cent of the students in the overseas schools learn a language other than English as their first language, it is important that adequate funding of language arts be provided.

Teachers do not have a duty-free lunch hour as provided by most schools in the states. Need for aditional food services is also expressed.

We are told that due to the devaluation of the dollar, the schools suffered a $2 million deficit in the year just completed, causing a shortage of supplies and services.

We urge you to consider full funding of the overseas schools for the children of our servicemen. We believe that in this time when so much attention is being given to the quality of education for all children, these children should be given the same opportunity.

We are grateful for this opportunity to express or views to you and the committee members and will appreciate your favorable consideration.

Sincerely,

Mrs. Walter G. Kimmel,
Coordinator of Legislative Activities, National PTA.

USE OF MILITARY PERSONNEL

Chairman Ellender. Earlier in these hearings, I expressed my concern over the fact that, on an outlay basis, 56 percent of the Department of Defense Budget for fiscal year 1973 is for manpower related costs. During fiscal year 1968—the peak of the Southeast Asia buildup—only 42 percent of total defense outlays were required for manpower related costs. Let us look at the number of individuals involved and their costs: During fiscal year 1964, there were 3,720,000 military and civilian personned in the Department of Defense, the cost of which was $22 billion; during fiscal year 1968, the number of individuals increased to 4,834,000 and the cost increased to $32.6 billion; and the budget for fiscal year 1973 is based on 3,394,000 individuals at a cost of $42.8 billion. In other words, during fiscal year 1973, there will be 1,440,000 fewer individuals in the Defense Department than we had during fiscal year 1968, but the cost will be $10.2 billion greater.

INCREASES IN PAY RATES

The tremendous increase in the manpower costs of the Department of Defense is for the most part the result of recent substantial increases granted by the Congress in the pay of civilian and military personnel. These increases may be summarized as follows:

For military personnel, an increase of 124.8 percent in basic pay from fiscal year 1964 to fiscal year 1973.

For civilian personnel, an increase of 64.5 percent for classified rates, and if wage board rates are considered, the increase is nearly 70 percent.

I will include in the record at this point a tabulation setting out the increases in basic military pay and classified rates for fiscal year 1946 through fiscal year 1973.

(The information follows:)

TABLE 5

Department of Defense

PAY INCREASES AND PAY AND PRICE INDICES SINCE 1945

Military and civilian pay increases			Pay & purchase price indices (FY 1964=100)			
Effective date	Military basic pay	Classified civilian salaries	Fiscal year	Military basic pay	Classified civilian salaries	Purchase price a/
7/1/45	-	15.9%	1946	48.0	50.2	
7/1/46	23.7%	14.2%	1947	59.4	57.4	
7/1/48	-	11.0%	1948	59.4	57.4	
10/1/49	22.9%	-	1949	59.4	63.7	78.2
10/28/49	-	4.1%	1950	69.6	65.4	76.2
7/1/51	-	10.0%	1951	73.0	66.3	83.3
5/1/52	4.0%	-	1952	73.5	72.9	83.1
3/1/55	-	7.5%	1953	75.9	72.9	82.3
4/1/55	10.0%	-	1954	75.9	72.9	80.6
1/1/58	-	10.0%	1955	77.8	74.7	84.6
6/1/58	8.3%	-	1956	83.5	78.4	88.8
7/1/60	-	7.7%	1957	83.5	78.4	94.9
10/14/62	-	5.5%	1958	84.1	82.3	96.2
10/1/63	14.2%	-	1959	90.4	86.3	98.1
1/5/64	-	4.1%	1960	90.4	86.3	97.6
7/1/64	-	4.2%	1961	90.4	92.9	99.3
9/1/64	2.3%	-	1962	90.4	92.9	98.9
9/1/65	10.4%	-	1963	90.4	96.5	99.4
10/1/65	-	3.6%	1964	100.0	100.0	100.0
7/1/66	3.2%	2.9%	1965	105.6	106.3	102.3
10/1/67	5.6%	4.5%	1966	116.6	109.2	104.2
7/1/68	6.9%	4.9%	1967	120.3	113.3	106.8
7/1/69	12.6%	9.1%	1968	125.3	117.1	109.6
1/1/70	8.1%	6.0%	1969	135.8	124.2	113.7
1/1/71	7.9%	6.0%	1970	159.1	139.6	118.7
11/14/71	b/11.6%	-	1971	171.9	147.9	125.3
1/1/72	7.2%	5.5%	c/1972	198.5	156.4	129.9
			c/1973	224.8	164.5	133.5

a/ Non-compensation component of the deflator for federal purchases of goods and services. Source: 1949-71, Dept. of Commerce. FY 1972 & FY 1973, estimated (3.7% increase for FY 1972 & 2.8% increase for FY 1973).

b/ 5% for personnel with less than 2 years of service, and 2% for those with over 2 years.

c/ Reflects 1/1/72 pay raise and assumes slightly smaller pay raise 1/1/73, plus enactment of proposed volunteer-related pay legislation effective 7/1/72.

NOTE: Military basic pay and civilian salaries are not comparable. A 4% increase in basic pay is approximately equivalent to a 3% salary increase.

FISCAL YEAR 1973 MILITARY STRENGTH

Chairman ELLENDER. The budget for fiscal year 1973 is based on a total active duty military end strength of 2,358,000, which is made up of the following:

Army	841,000	Marine Corps	198,000
Navy	602,000	Air Force	717,000

On an outlay basis, this total military force will require about $25.1 billion for pay and related costs, as follows:

	Billion		*Billion*
Basic pay	$18.5	Family housing cost	.6
Other pay and allowances	6.0		

This total does not include about $4.9 billion for the pay of retired military personnel.

The total cost of our active duty military personnel dictates that every effort be made to use this personnel wisely and only for purposes that are absolutely essential to the defense of our country and only in those assignments that cannot be performed by civilian personnel. Based on testimony in these hearings, I am not convinced that this is the case.

ASSIGNMENT OF MILITARY PERSONNEL

At the end of fiscal year 1973, the plan calls for 1,062,000 of our 2,358,000 active duty military personnel to be assigned to what the Department of Defense calls mission forces. These include the personnel assigned to units supporting Minuteman and Titan II ICBMs; B–52 and FB–111 bombers; Polaris and Poseidon submarines; air defense interceptor squadrons; air defense missile batteries; air defense warning systems; Army and Marine Corps divisions and equivalents; Navy ships; and Navy, Marine Corps, and Air Force tactical air forces. The balance of 1,296,000 personnel is assigned to "other missions" and "general support."

I will include in the record at this point a tabulation setting out the assignment of our active duty military forces for fiscal years 1971, 1972, and 1973.

(The information follows:)

DOD MILITARY MANPOWER REQUIREMENTS

[Active duty end strengths in thousands]

	Fiscal year—		
	1971 actual	1972 estimate	1973 estimate
Mission forces:			
Strategic forces	130	130	127
General purpose forces:			
Land forces	638	513	516
Tactical air forces	167	166	167
Naval forces	205	206	195
Mobility forces	72	65	57
Subtotal, Mission forces	1,212	1,079	1,062
Other missions:			
Intelligence and security	91	75	68
Communications	55	52	50
Research and development	37	37	35
Support to other nations	21	17	27
Subtotal, Other missions	204	181	180
General support:			
Base and individual support	580	513	506
Training	550	460	458
Command	138	129	121
Logistics	30	30	31
Subtotal, General support	1,298	1,132	1,116
Total, DOD	2,714	2,392	2,358

OTHER MISSION AND GENERAL SUPPORT FORCES

Chairman ELLENDER. The Department of Defense, the Army, the Navy, the Marine Corps, the Air Force, and the Congress are going to have to take a hard look at all military personnel assigned to other than actual fighting missions. Can we afford to have 68,000 military personnel assigned to intelligence and security functions? What is the need for the 50,000 military personnel engaged in communications activities? Why must we have 506,000 military personnel assigned to base and individual support activities, 121,000 engaged in command assignments, 31,000 assigned to logistics activities, and 35,000 in research and development activities? These are the questions we need to address. I have given considerable attention to the need for the 35,000 military personnel assigned to research and development activities, and I will discuss this matter later in this statement.

SUPPORT OF COMBAT PERSONNEL

During the course of the hearings I made an effort to establish the number of personnel required to support each of our men assigned to fighting units—that is, how many men are required to support each of our fighting men. I had hoped that it would be possible to establish a method for determining this ratio that would be uniform and applicable to each of the Services. However, I found that, because of wide differences in the combat missions of the Army, Navy, Marine Corps, and Air Force, this is not practicable.

I found that the most comprehensive treatment of this subject to date is contained in the military manpower requirements report for fiscal year 1973, submitted by the Department of Defense pursuant to the requirements of Public Law 92–129. I will include in the record at this point the information on the combat-to-support ratio on pages 70 through 72 of this report.

(The information follows:)

The Combat-to-Support Ratio

A. Introduction

In earlier chapters of this report we discussed the mission forces of the Department of Defense and the manpower required to operate those forces, and in the previous section we defined a concept of support. A comparison of combat elements and support is inevitable. There are several alternative ways of reflecting the distribution of manpower between combat and support functions.

B. Defining the Ratio

There is a wide range of valid answers to the question, "What is the combat-to-support ratio?" There is no "best" definition. The definition of what can be included in combat varies by Service because of differing organizations and missions; for example, the Navy and Air Force tend to be weapons systems oriented, requiring fewer men directly engaging the enemy than do the Army and Marine Corps. Therefore, there are many ways to define combat and support and no simple ratio can be used as an adequate measure of whether there is a proper balance between mission forces and support.

This report presents seven different views of combat and support for each Service, beginning with a very detailed level (i.e., individual skills) and ranging up through the broad level of major Defense Programs. A detailed discussion of each method is shown below.

Combat Skills. This category includes all individuals whose primary duty is to fire at the enemy. For the Army and Marine Corps, it includes infantry, armor/cavalry, and artillery skills. For the Navy, it includes unrestricted line officers, torpedomen, fire control technicians, aviation antisubmarine warfare operators, gunners mates, and minemen. For all Services, it includes the crews of mission aircraft.

Intermediate Combat Units. This category includes units at the battalion, squadron, ship level whose primary mission is to fire at the enemy. For the Army and Marine Corps, it includes infantry, armor/cavalry, and artillery units of battalion or smaller size. For the Navy, it includes combat ships. For all Services, it includes combat aviation units of squadron or smaller size.

Modified Major Mission and Support Categories. This grouping is the same as described below, except that units which provide direct support are removed from the standard categories and placed in a separate Direct Support category. For example, Navy support ships are moved from Force Mission to Direct Support. The number shown is the percentage of total manpower which remains in Force Mission units.

Major Mission and Support Categories. This system was introduced in Chapter I and consists of three major categories: Force Mission, Other Mission, and General Support. The number shown is the percentage of total manpower in Force Mission units. The logic here is that the Services are given primary missions (as discussed in Chapter III), and they require a certain amount of support to accomplish those missions; the support is discussed in Chapter IV (Other Mission) and later in this chapter (General Support).

Major Combat Units. This category covers large organizational elements that engage in combat as an entity even though parts of the organizations may not directly face hostile fire as their primary mission. For the Army and Marine Corps, it includes divisions and their deployed supporting units, separate brigades, regiments, and separate combat units such as artillery, air defense, aviation, target acquisition, and special forces. For the Air Force and Marine Corps Air Units, it includes the total wing structure, including aircraft and missile squadrons, maintenance, munitions, weapons system security and command functions. For the Navy, it includes the fleet structure, encompassing fleet commands, type commands, and all subordinate units.

FYD Programs I, II, IV. This category includes the Five Year Defense Programs I (Strategic Forces), II (General Purpose Forces), and IV (Airlift, Sealift Forces). In addition to combat and combat support units, these programs include all base support, crew and unit training, logistics support, and command and control support necessary to accomplish the mission of the programs.

Operating Forces. This category consists of all combat units, combat support units, and all deployed support. This represents a close approximation of the Operating Forces categories that were previously used in budget presentations to the Congress prior to FY 1962, the main categories of which are Operating Forces, Supporting Forces (including special activities), Training Forces, and Individuals (transients, patients, and prisoners).

Using the preceding seven definitions, the table below indicates for each Service the per cent of total military manpower which could be considered as "combat." In general, there has been a slight decline in these percentages since 1964, for reasons which are explained later in this section.

PERCENT OF MILITARY MANPOWER IN COMBAT/FORCE MISSION UNITS, FY 64-73 a/

	FY 64	FY 68	FY 71	FY 72	FY 73
Army					
Combat Skills	*	*	23	23	24
Intermediate Combat Units (Battalions)	*	*	23	24	26
Major Mission & Support Categories (Modified)	37	31	27	33	34
Major Mission & Support Categories	57	50	51	51	53
Major Combat Units (Divisions)	*	*	49	52	54
FYD Programs I, II, IV	63	52	53	53	54
Operating Forces	64	55	57	56	57
Navy					
Combat Skills	*	*	11	11	11
Intermediate Combat Units (Ships/Sqdns)	38	35	33	35	34
Major Mission & Support Categories (Modified)	38	35	33	35	34
Major Mission & Support Categories	50	50	46	48	47
Major Combat Units (Fleets)	53	53	49	50	49
FYD Programs I, II, IV	63	63	58	59	57
Operating Forces	62	63	60	61	60
Marine Corps					
Combat Skills	*	*	28	28	28
Intermediate Combat Units (Battalions)	*	*	28	32	32
Major Mission & Support Categories (Modified)	42	42	38	45	45
Major Mission & Support Categories	58	52	48	54	54
Major Combat Units (Divisions/Wings)	*	*	48	53	54
FYD Programs I, II, IV	68	61	59	63	64
Operating Forces	69	60	60	65	65
Air Force					
Combat Skills	*	*	5	5	5
Intermediate Combat Units (Squadrons)	9	11	12	12	12
Major Mission & Support Categories (Modified)	31	32	29	29	28
Major Mission & Support Categories	34	44	33	33	32
Major Combat Units (Wings)	61	61	57	58	56
FYD Programs I, II, IV	63	64	59	58	58
Operating Forces	74	77	72	71	70

a/ Numbers shown are "combat" personnel as a per cent of total manpower in each Service. The total includes "individuals" (trainees, transients, etc.). If combat personnel are taken as a per cent of the manpower in units, the percentage will be higher.

NOTE: * Data presently not available.

The categories shown in the table can and do serve to measure general trends in combat-to-support ratios. But this is all they can do. Forces cannot be designed to meet an abstract concept like combat-to-support ratio, but instead must be designed to provide an efficient mix of combat and support units to accomplish the specific tasks given to the Services.

AIR FORCE RATIOS

Chairman ELLENDER. It will be noted in this tabulation that the percentage of Air Force personnel in combat assignments is substantially lower than those of other Services under the more restrictive methods of computing the ratios. For instance, using the "combat skills" method, the Army has 24 percent in combat, the Navy has 11 percent in combat, the Marine Corps has 28 percent in combat, and the Air Force has only 5 percent in combat. Using the "intermediate combat units" method, we find that the Army has 26 percent in combat, the Navy has 34 percent in combat, the Marine Corps has 32 percent in combat, and the Air Force has only 12 percent in combat. These lower percentages for the Air Force were such that I felt I needed an explanation, and I requested Maj. Gen. Joseph R. De Luca, director of the Air Force budget, to review the tabulation and provide me with an explanation, which he did. I will include this explanation in the record at this point.

(The information follows:)

THE COMBAT-TO-SUPPORT RATIO

This paper addresses the percent of Air Force manpower in combat/force mission units as shown in the table on page 72 of the "Military Manpower Requirements Report for FY 1973" (Department of Defense, FY 1973).

The table in question was intended to be illustrative of the many possible ways of viewing "combat" manpower for each of the Services. It was developed by the Office of the Secretary of Defense in response to a request from the Chairman of the Senate Armed Services Committee who, in a letter to the Secretary of Defense dated December 8, 1971, stated in part:

> "It is widely recognized that there are several possible methods of defining precisely what constitutes "combat" and "support." It is suggested that several ways of distinguishing between combat and support manpower be developed and the results of using each of these alternative methods should be shown."

In discussing the combat/support issue on page 70 of the Report, OSD makes three very significant points:

a. That there is no "best" definition of combat and support.

b. That what can be included in "combat" varies by Service because of differing organizations and missions.

c. That there is no simple ratio which can be used as an adequate measure of whether there is a proper balance between mission forces and support.

This background is highlighted because it is important to the understanding of just what is being portrayed in the table and of the limited conclusions which can be drawn from the data presented therein.

For the Air Force, the table presents alternative definitions which result in "combat" to total military ratios ranging from 5 percent to 70 percent. The 5 percent ratio for "Combat Skills" was derived by arbitrarily limiting the definition of "combat" skills to aircraft and missile crew positions. The second definition, "Intermediate Combat Units," resulted in a 12 percent ratio and limited "combat" units to the wings and assigned mission squadrons of bombardment, fighter, reconnaissance, missile and tactical airlift units.

The first definition totally excluded the maintenance, security and control personnel who are essential for the protection, launch, control and effective employment of mission aircraft and missiles. Most of these types of personnel were also excluded by the second definition. For this reason alone, neither definition can be accepted as a realistic measure of Air Force combat manpower.

The first two definitions as well as the third and fourth ("Major Mission and Support Categories") also exclude supply, base maintenance, medical and other direct combat support personnel who are essential for the sustained operation of combat units. It should be noted that while these combat support personnel do not normally bring fire on the enemy, they are all potentially deployable to forward areas where they are exposed to hostile fire.

The remaining definitions used in the table add direct combat support personnel on an incremental basis until the 70 percent ratio is reached by using the "Operating Forces" definition. Within the Air Force, this 70 percent ratio, which represents the proportion of military personnel in major Defense programs I through V (Strategic, General Purpose, Intelligence and Communications, Mobility, and Reserve) is considered a realistic definition of "mission" personnel. The remaining 30 percent are required to support these mission personnel in the areas of research and development, logistics, training and other personnel support, and administration; and to fulfill our responsibilities for support to other nations.

While the unrealistically low "combat" ratios of 5 percent and 12 percent were merely presented by OSD for illustrative purposes, their use does raise two issues which are appropriate for further comment. These are, first, the proportion of actual air/missile crew members in the Air Force relative to the proportions of personnel bringing fire on the enemy in the other Services and, second, the overall significance of "support" proportions, however defined, in addressing the manpower resource mix.

Addressing the first issue, it is a fundamental fact that the Air Force, by the very nature of its assigned mission, will never have as high a proportion of its personnel in potential direct contact with enemy forces as the other Services, nor should it. As a basic unit of combat employment, for example, an A-7 squadron has 27 primary aircrew members (pilots); by contrast, the entire complement of a destroyer (about 300), or an infantry battalion (800 to 900) come in contact with the enemy. At the same time, the complexity of Air Force aircraft and equipment demands a relatively high number of personnel for maintenance, launch and recovery. The same A-7 squadron requires 290 maintenance personnel and 175 munitions loaders. This complexity and, consequently, the relative proportion of ground crews to aircrew personnel has been increasing over the years and can be expected to increase in the future. This is appropriate because the effectiveness of weapons systems--firepower--has also been increasing, both in absolute terms and relative to the numbers of personnel directly exposed to combat. Not only has firepower increased but, through more sophisticated command, control, and guidance systems (which also increase personnel costs), accuracy of delivery has increased. The effectiveness of the Air Force, then, cannot be measured in terms of proportions of crew members, combat personnel or mission personnel, but must instead be evaluated in terms of capability to respond to the threat: to deploy and to destroy targets.

This leads to the second issue, that of overall mission/support resource mix. Our forces are structured to accomplish missions in support of attaining national objectives. The mix of resources required to support these force is designed to provide maximum capability at minimum cost. No "support" or "overhead" resources are applied which are not essential, directly or indirectly, for accomplishment of the combat mission. The resultant ratios are merely statistical by-products of this force/manpower structuring. In the paragraph immediately following the table in question (pages 72 and 73 of the Report), OSD makes this same point by stating "Forces cannot be designed to meet an abstract concept like combat-to-support ratio, but instead must be designed to provide an efficient mix of combat and support units to accomplish the specific tasks given to the Services."

The combat and support manpower resources requested in the Air Force budget submission for FY 1973 do represent our best estimate of this most efficient mix.

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MAINTENANCE PERSONNEL

Chairman ELLENDER. As pointed out in this explanation, the fact that maintenance personnel are excluded from "combat" assignments is the greatest cause of the lower Air Force ratios of combat to support.

MILITARY PERSONNEL IN SUPPORTING FUNCTIONS

As I stated earlier, there must be a strong effort made to reduce the number of personnel required to support our forces that actually do the fighting. Once this is done, we need to determine how many of these required supporting personnel must be military personnel. I am convinced that there is a large number of military personnel assigned to such activities as communications, medical, logistics, administration, and research and development where the work could be performed as well or better and at less cost by civilian employees.

DEFENSE SUPPLY AGENCY

A good example of an unnecessary use of military personnel is found in the Defense Supply Agency. The mission of this Agency is to provide supply support for a wide range of consumable materiel and repair parts to the military services, to administer several Department of Defense logistics services programs, such as coordinated procurement; Federal cataloging; the military standard logistics data system; surplus disposal; and perform contract administration services for central procurement. None of these functions involves combat activities or is located near such activities. The fiscal year 1973 budget is based on the Defense Supply Agency's utilizing approximately 45,000 civilian employees and 1,163 assigned military personnel. The military personnel includes the following: one lieutenant general, 12 major generals/rear admirals (upper half), seven brigadier generals/rear admirals (lower half), 187 colonels/captains, 389 lieutenant colonels/commanders, 277 majors/lieutenant commanders, 123 captains/lieutenants, 16 first lieutenants (j.g.), 10 warrant officers, and 141 enlisted personnel. It is likely that a thorough review of the need for military personnel assigned to this Agency will reveal that at least 1,000 of these positions could be filled by civilian personnel. As a rule of thumb, four civilians can replace five military personnel assigned to these types of activities. I am convinced that, if a determined effort were made by the Department of Defense, the work now being done by the 1,163 military personnel could be performed as well by 163 military personnel and 800 civilians.

RESEARCH AND DEVELOPMENT ACTIVITIES

One of the most difficult assignments of military personnel for me to understand is the total of 35,000 assigned to various research and development activities of the Department of Defense. Of this number, approximately 11,000 are officers. Of the 35,000 military personnel assigned to research and development activities, 9,000 are in the Army, 7,000 in the Navy, and 19,000 in the Air Force. I have been advised by the Department of Defense that these 35,000 individuals are assigned to the following types of organizations and facilities:

Headquarters	1,700
Research and development centers	5,800
Laboratories	8,800
Test facilities	17,900
Project ships	800

COST OF MILITARY PERSONNEL ASSIGNED TO RESEARCH AND DEVELOPMENT

The estimated cost of the 35,000 military personnel assigned to these R. & D. activities is approximately $360 million. This is paid from the "Military personnel" appropriations—not from the appropriations made for "Research, development, test, and evaluation."

DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

I also question the need for the 60 military personnel assigned to the office of the Director of Defense Research and Engineering. There are 240 civilian employees assigned to this office of which 66 are in grade GS–16 (about $33,000 per annum). Of the 60 military personnel, six are generals/admirals, and 47 are colonels/captains. I hope that assignments of this nature will be thoroughly reviewed by the Secretary of Defense for their necessity.

ASSIGNMENT OF MILITARY PERSONNEL OUTSIDE THE PAYING SERVICE

In reviewing this matter of military personnel assigned to noncombat activities, I reached the conclusion that one reason the managers of various Department of Defense programs use military personnel rather than civilians is that the cost of military personnel is not a charge against the funds provided for their programs. On the other hand, if they used civilian personnel, this cost would be paid from "Operation and maintenance" funds allocated to their programs. This is true because all military personnel are paid from the "Military personnel" appropriations, and the services are reimbursed for this cost when the individuals are assigned to certain duties outside the Department of Defense.

The fiscal year 1973 personnel plan is based on approximately 16,200 military personnel being assigned outside their pay service. Of this total, about 6,600 are officers. Of this total number, about 12,300 will be assigned to duties within the Department of Defense for which there is no reimbursement, about 2,600 will be assigned to agencies outside the Department of Defense for which the Services will be reimbursed, and about 1,200 will be assigned outside the Department of Defense on a nonreimbursable basis.

The fact that the use of military personnel is expensive must be stressed by the Department of Defense in approving the assignment of military personnel to noncombat activities. In computing the reimbursement for the services of military personnel, the Department of Defense has established rates for each of the various pay grades. For example, the cost of a vice admiral is $37,216 per annum, a captain $27,815, and a lieutenant commander $19,239. The rates established for the Navy are comparable to the rates established for the other services. I will include in the record at this point the current rate of reimbursement for Navy personnel.

(The information follows:)

FISCAL YEAR 1973 ANNUAL COMPOSITE STANDARD RATES, EFFECTIVE JULY 1, 1972

NAVY

Grade	Basic pay	Basic allowance for quarters	Miscellaneous expense	Incentive and special pay	Annual composite standard rate
O–10	$36,000	----------	$4,141	$1,184	$41,325
O–9	33,685	----------	2,156	1,375	37,216
O–8	30,373	$2,000	1,585	1,208	35,166
O–7	26,406	1,862	1,585	1,184	31,037
O–6	22,571	2,166	1,585	1,493	27,815
O–5	17,542	2,225	1,585	1,666	23,018
O–4	14,361	2,029	1,585	1,264	19,239
O–3	11,756	1,597	1,585	1,359	16,297
O–2	8,675	1,185	1,585	828	12,273
O–1	6,783	734	1,585	389	9,491
W–4	14,600	805	1,585	97	17,087
W–3	11,922	2,007	1,585	101	15,615
W–2	9,774	1,966	1,585	98	13,423
W–1	8,312	244	1,585	97	10,238
E–9	11,404	1,708	1,318	279	14,709
E–8	9,565	1,594	1,318	418	12,895
E–7	8,088	1,334	1,318	383	11,123
E–6	6,738	1,262	1,318	379	9,697
E–5	5,269	856	1,318	360	7,803
E–4	4,511	537	1,318	322	6,688
E–3	4,117	327	1,318	128	5,890
E–2	3,848	169	1,318	74	5,409
E–1	3,446	39	1,318	42	4,845
Midshipmen	3,184	----------	769	----------	3,95

Assignment to Noncombat Activities

Chairman Ellender. It is my intention to bring this matter of the assignment of military personnel to noncombat activities to the attention of the subcommittee during the markup of the bill. I am convinced that substantial savings can be made in the budget by the Department of Defense by (1) eliminating those assignments which are not essential to the defense of the country, and (2) using civilian employees in a large number of essential noncombat assignments that are now filled with military personnel.

As the cost of military personnel continues to increase and as we face more of the problems associated with an all-volunteer force without the benefit of the draft, the assignment of military personnel to noncombat activities will become an even greater problem. In my view, we should attack the problem immediately.

Subcommittee Recess

The Subcommittee on Defense Appropriations will remain in recess until further order from the Chair.

(Whereupon, at 12:30 p.m., Friday, March 24, the subcommittee was recessed, to reconvene at the call of the Chair.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

WEDNESDAY, APRIL 12, 1972

U.S. SENATE,
COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The committee met at 4 p.m. in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Magnuson, Stennis, Young, Allott, Cotton, Case, Fong, Boggs, and Brooke.

DEPARTMENT OF DEFENSE

Admiral Thomas H. Moorer, Chairman, Joint Chiefs of Staff, gave the committee a classified briefing.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

THURSDAY, MAY 4, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The subcommittee met at 2 p.m. in room S–128, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

After consideration of other business, the subcommittee proceeded with the matter at hand.

DEFENSE NUCLEAR AGENCY

RESEARCH, DEVELOPMENT, TEST AND EVALUATION, DEFENSE AGENCIES

FISCAL YEAR 1973 BUDGET AMENDMENT

STATEMENT OF DR. JOHN A. NORTHROP, DEPUTY DIRECTOR, SCIENCE AND TECHNOLOGY

ACCOMPANIED BY:
WILLIAM M. PLOUGH, ACTING COMPTROLLER
PETER HAAS, SCIENTIFIC ASSISTANT TO THE DEPUTY DIRECTOR, SCIENCE AND TECHNOLOGY

BUDGET AMENDMENT

Chairman ELLENDER. The March 29, 1972, budget amendment includes $10.2 million for the appropriation "Research, development, test and evaluation, defense agencies," of which $5 million is for nuclear weapons effects research program of the Defense Nuclear Agency.

The original fiscal 1973 budget request includes $128,741,000 for this program, and the revised request is $133,741,000. The original request was the subject of a hearing on March 23, 1972, and that discussion is found on pages 1011 to 1042 of the hearings.

The principal witness is Dr. John A. Northrop, Deputy Director, Defense Nuclear Agency.

You may proceed.

Dr. NORTHROP. Mr. Chairman and members of the committee:

I am Dr. Northrop, Deputy Director for Science and Technology of the Defense Nuclear Agency. You have heard testimony in support of the DOD fiscal year 1973 budget amendment. In the R.D.T. & E. section, four purposes were set forth, one of which was to improve our capability to conduct operational test and evaluation in response to

the Blue Ribbon Defense Panel recommendations. Electromagnetic pulse (EMP) as a potential disruptive effort on communications was noted.

This Agency, over the last several years, has worked to define this EMP threat and aid the services in improving the hardening of most of our strategic systems against this threat.

But in addition to these systems, our ability to communicate in a nuclear environment has been questioned. [Deleted.]

TOTAL DOD R. & D. PROGRAM

Chairman ELLENDER. Is your revised fiscal year 1973 program of $133.7 million a part of the total Department of Defense R. & D. program of $8.7 billion that is managed by Dr. Foster?

Dr. NORTHROP. Yes, sir. It is a part of the total Department of Defense program.

Chairman ELLENDER. Is the Defense Nuclear Agency under the direction of Dr. Foster, or is it an independent organization? I want to establish your relationship to Dr. Foster.

Dr. NORTHROP. Yes, sir. We are an independent agency. Our R.D.T. & E. program is specifically controlled by Dr. Foster. Our Agency is not part of his staff directly.

AGENCY PERSONNEL AND FUNCTION

Chairman ELLENDER. How many personnel are on your staff?

Mr. PLOUGH. 1,600.

Chairman ELLENDER. For the total Agency?

Mr. PLOUGH. For the total Agency.

Chairman ELLENDER. What is your function?

Mr. PLOUGH. Nuclear weapons effects research and test management, control of the nuclear stockpile.

Dr. NORTHROP. Lieutenant General Dunn appeared before your committee several weeks ago.

Chairman ELLENDER. How many of these 1,600 people are engaged in R. & D. activities of the type managed by Dr. Foster?

Dr. NORTHROP. Let me differentiate. Of this total number of people Mr. Plough has indicated are assigned to the Nuclear Defense Agency, a relatively small number of them are associated with the R.D.T. & E. program. Approximately 600 including headquarters support of the 1,600 are associated with the administration and execution of Dr. Foster's R.D.T. & E. program within our Agency.

Chairman ELLENDER. What is their function as it relates to Dr. Foster's work?

Dr. NORTHROP. We have our basic program of over some $100 million which is basically for nuclear weapons effects research and tests.

RELATIONSHIP TO AEC

Chairman ELLENDER. That is not a part of the AEC?

Dr. NORTHROP. No, sir; it is not part of the AEC.

Chairman ELLENDER. AEC, as I understand, spends about half of its budget for defense.

Dr. NORTHROP. That is correct.

Chairman ELLENDER. Your agency is not part of that effort?

Dr. NORTHROP. We are not part of that. Let me distinguish. The AEC expends slightly less than half of its budget designing, testing,

and manufacturing nuclear explosives. What we are responsible for in the DOD, totally across the DOD, of course, is to provide the design and fabrication of the delivery systems. That is, it may be the missile system and the radars, not the nuclear warhead which is the responsibility of the AEC, but the delivery system, whether it be aircraft or missiles.

Now, the responsibility of the Defense Nuclear Agency as its part of the total Department of Defense responsibility is to go into the area of nuclear weapons effects. That is, how do the results of explosions of nuclear bombs in warfare affect the ability of our military systems to perform their mission in such a nuclear environment.

This is the basic part of our program, how do we manufacture, how do we design weapons systems of all varieties that will survive nuclear blast, as opposed to the conventional.

Research in the Defense Nuclear Agency

Chairman Ellender. But your agency is considered a part of the R.D.T. & E. program is it not?

Dr. Northrop. Our agency has multiple responsibilities, part of which is in the R.D.T. & E. program. It constitutes the majority of our budget but the smaller fraction of our personnel, since most of our R.D.T. & E. work is done outside the agency.

Chairman Ellender. I am very much disturbed over the number of people engaged in this R.D.T. & E. work, which, in my opinion, is not as productive as it should be.

Proceed.

Hardening Programs

Dr. Northrop. Programs to harden communication systems to the other nuclear effects of radiation, blast, blackout, and fallout are available and present no new unknowns in their solution.

EMP Research Programs

EMP research has not progressed to the same status largely because of our lack of data from atmospheric nuclear tests and our inability to conduct this work in underground tests. Only within the last year has it become feasible to design and construct laboratory simulators capable of covering sufficiently large areas for this purpose.

This budget amendment is intended to provide the initial effort to evaluate the effects of threat level, EMP [deleted].

Last year, we started procurement of a radiating EMP facility for tests of [deleted] communication facilities, called TEMPS. It is scheduled to be available in early 1973. The funds requested in this budget amendment are needed to initiate the pretest analysis program needed to conduct EMP effects tests with TEMPS on elements [deleted].

Contractual Work

Chairman Ellender. You say there are 1,600 personnel in your organization?

Dr. Northrop. Yes, sir.

Chairman Ellender. How much of the work that is assigned to you is performed under contract?

Dr. Northrop. In limiting my comments to the R.D.T. & E. program only, sir?

Chairman ELLENDER. I refer to you total effort. You are the head of the Defense Nuclear Agency. As you said, you have around 1,600 personnel.

Dr. NORTHROP. That is correct.

Chairman ELLENDER. Is most of your work performed under contract?

IN-HOUSE RESEARCH

Dr. NORTHROP. Sir, our R.D.T. & E. program is done almost entirely out-of-house with a small exception which is in in-house work done by the Armed Forces Radiobiology Research Institute.

Chairman ELLENDER. How many people are required for such in-house work?

Dr. NORTHROP. That is 600 people involved in the R.D.T. & E. work which is primarily administration with most of that work being done out-of-house. Of the remaining personnel, which is the majority of approximately 1,000, those people do work in-house, not in the R.D.T. & E. program, but in other assigned areas such as stockpile management. So, all of that work is done in-house.

Chairman ELLENDER. Then the 1,600 personnel represent all of the people within your organization?

Dr. NORTHROP. Yes, sir.

Chairman ELLENDER. Proceed.

SURVIVABILITY-VULNERABILITY DATA

Dr. NORTHROP. The results of the analyses, together with test data, will be used to develop a survivability/vulnerability methodology to assist in establishing and evaluating a balanced hardened system. Initial efforts would define and perform pretest analysis on both critical components and a coupled network. Present EMP simulators will be utilized to acquire data on some of the priority components.

We furthermore will procure at least one additional simulator, similar to but of much reduced size and output, as well as necessary instrumentation. These are needed for follow-on component and coupled network testing to be conducted with TEMPS.

Theoretical studies will also be developed to test the smallest coupled network. Further efforts will be devoted to field tests of multinode networks. This entire program has been jointly planned and will be conducted with the Defense Communications Agency (DCA).

Sir, this completes my statement.

NUCLEAR BLAST EFFECTS

Chairman ELLENDER. Am I to understand that your principal work is to find the effects that nuclear bombs might have on our communications system?

Dr. NORTHROP. Our total work involves the effects that nuclear explosions have on all military systems.

The specific purpose of this budget amendment now is to provide facilities for the communications system. Our general responsibility covers the nuclear effects on all military systems.

SUBCOMMITTEE RECESS

Chairman ELLENDER. Are there any further questions? If not, the subcommittee will recess, subject to the call of the Chair.

(Whereupon, at 4:50 p.m., Thursday, May 4, the subcommittee was recessed, to reconvene at the call of the Chair.)

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

FRIDAY, MAY 5, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The Intelligence Operations Subcommittee met at 9:30 a.m. in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Stennis, Young, and Smith.

INTELLIGENCE COMMUNITY BUDGET

The subcommittee heard the classified testimony of Mr. Richard Helms, Director of Central Intelligence.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

MONDAY, MAY 8, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The Intelligence Operations Subcommittee met at 10 a.m. in room S–126, the Capitol, Hon. Allen J. Ellender, (chairman) presiding.

Present: Senators Ellender, Young, and Smith.

CENTRAL INTELLIGENCE AGENCY

The subcommittee heard the classified testimony of Mr. Richard Helms, Director of Central Intelligence.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

FRIDAY, MAY 12, 1972

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The Intelligence Operations Subcommittee met at 10 a.m. in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender, Young, and Smith.

DEPARTMENT OF DEFENSE INTELLIGENCE PROGRAMS

The subcommittee heard the classified testimony of Dr. Albert Hall, the Assistant Secretary of Defense for Intelligence.

DEPARTMENT OF DEFENSE APPROPRIATIONS FOR FISCAL YEAR 1973

MONDAY, MAY 15, 1972

U.S. SENATE
SUBCOMMITTEE ON THE COMMITTEE ON APPROPRIATIONS,
Washington, D.C.

The Intelligence Operations Subcommittee met at 9:30 a.m. and at 2 p.m. in room S–126, the Capitol, Hon. Allen J. Ellender (chairman) presiding.

Present: Senators Ellender and Young.

NATIONAL SECURITY AGENCY

The subcommittee heard the classified testimony of Dr. Louis W. Tordella, Deputy Director, National Security Agency.

DEFENSE INTELLIGENCE AGENCY

The subcommittee heard the classified testimony of Lt. Gen. Donald V. Bennett, Director, Defense Intelligence Agency.

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