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HEARINGS

BEFORE THE

PREPAREDNESS INVESTIGATING SUBCOMMITTEE

OF THE

COMMITTEE ON ARMED SERVICES UNITED STATES SENATE

NINETIETH CONGRESS

SECOND SESSION

TESTIMONY OF

HON. HAROLD BROWN, SECRETARY OF THE AIR FORCE

GEN. JOHN P. McCONNELL, CHIEF OF STAFF, U.S. AIR
FORCE

GEN. JOSEPH J. NAZZARO, COMMANDER IN CHIEF,
STRATEGIC AIR COMMAND

GEN. JAMES FERGUSON, COMMANDER, AIR FORCE
SYSTEMS COMMAND

ADM. THOMAS H. MOORER, CHIEF OF NAVAL OPERA-
TIONS, U.S. NAVY

GEN. HAROLD K. JOHNSON, CHIEF OF STAFF, U.S.
ARMY

APRIL 30, MAY 1, 8, AND 10, 1968

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(II)

FOREWORD

Subsequent to the taking of the testimony contained in this volume, the transcript was sent to the Department of Defense for security review and for the deletion of classified matters. The use of "[Deleted]" in the printed transcript indicates material eliminated by the Department of Defense because of national security requirements and considerations.

(III)

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STATUS OF U.S. STRATEGIC POWER

TUESDAY, APRIL 30, 1968

U.S. SENATE,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE
OF THE COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee (composed of Senators Stennis (chairman), Symington, Jackson, Cannon, Byrd of West Virginia, Smith, Thurmond, and Miller) met, pursuant to recess, at 10 a.m., in room 224, Old Senate Office Building, Senator John Stennis presiding.

Present: Senators Stennis, Symington, Cannon, Byrd of Virginia, Smith, Thurmond, and Miller.

Also present: Senator Curtis.

James T. Kendall, chief counsel; Ben Gilleas, director of investigations; Stuart French, Samuel R. Shaw, and Everette L. Harper of the subcommittee staff.

Senator STENNIS. I have a brief opening statement here that I will read to bring this in focus.

Today, we continue with the fifth in our series of hearings on the balance of strategic power. We are examining our strategic weapons and our missile and bomber delivery systems in order to assess their adequacy to protect our Nation from nuclear attack.

We are very much interested in the present balance of power, but equally important is the question of our planning for the future. The subcommittee recognizes that tomorrow's strategic posture is today's strategic problem since development and deployment of modern complex weapon systems requires leadtimes of several years.

That is a very true fact, but it is not recognized entirely by the Members of our body who are not on the committee.

That was apparent in the debate on the organization bill last week.

Thus, we must make wise, prudent, and conservative provisions now if tomorrow's weapons are to be effective in preserving our national security. This is of particular importance in view of the recent dramatic improvements in Soviet strategic offensive and defensive forces.

We have previously heard testimony from the Director of Intelligence, the Chairman of the Joint Chiefs of Staff, the Director of Defense Research and Engineering, and the Assistant Secretary of Defense for Systems Analysis. It will now be helpful to discuss the problem from the standpoint of the military services and the operating commands, and to that end we have invited our witnesses for today.

Intercontinental ballistic missiles and long-range bombers, two of the three primary strategic weapon delivery systems, are the responsibility of the Air Force and Strategic Air Command. To discuss our

current posture in these areas, as well as our plans for the future, we have with us today the Secretary of the Air Force, Dr. Harold Brown; the Air Force Chief of Staff, General John P. McConnell; and the Commander in Chief of Strategic Air Command, General Joseph J. Nazzaro. I might add that we asked Dr. Brown to counsel with us on these questions not only to get the benefit of his thinking as Secretary of the Air Force, but also as one whose past service as Director of Defense Research and Engineering gives him additional impressive credentials in the field of strategic weapon systems.

We welcome you, gentlemen, and look forward to your testimony. I know it will make a significant contribution to the subcommittee's understanding of our Nation's strategic posture.

These hearings are highly important. I know that you agree. We are going to put in the record exactly what the situation is, the good and the bad. I think even though all the Members of the Senate and the Congress won't read this testimony, the fact that some of us will know about it, and the fact that it is studied by the staff, will be highly valuable.

As I said, we have with us the Secretary of the Air Force, Dr. Harold Brown; the Air Force Chief of Staff, General John P. McConnell; and the Commander-in-Chief of Strategic Air Command, General Joseph J. Nazzaro.

All right, gentlemen. I understand that all of you have statements. I hope it is agreeable to the committee that we may take those statements without major interruptions, at least. If there are parts of them that you are willing to put in the record and read on a blue-pencil basis, that will be helpful. We will try to get the major points from the viewpoint of the subcommittee and the staff brought out, with some questions by Mr. Kendall, if that is agreeable. Then each Senator can proceed.

Senator MILLER. Will the chairman yield at that point?

I understand that Dr. Brown has blue-penciled his statement. Would it be the chairman's purpose to permit questions following his statement, and then questions following General McConnell's statement? It might be helpful to me, because I may be called up to an executive meeting of the Agriculture Committee later.

Senator STENNIS. I certainly would not exclude you from that, Senator. I will bear that in mind.

As I understand, Dr. Brown has suggested that the Chief of Staff, General McConnell, go first.

Dr. BROWN. I believe, Mr. Chairman, that would be a better sequence.

Senator STENNIS. And then you, followed by General Nazzaro.

All right.

Senator Miller, I will just say this: Any time you feel the press of time because of your other commitment, let me know, and we will take care of it.

Senator MILLER. Yes, sir.

Senator STENNIS. All right.

General McConnell, we are especially glad to have you here, sir. I really look forward to this part of these hearings.

STATEMENT OF GEN. JOHN P. McCONNELL, CHIEF OF STAFF, U.S. AIR FORCE

General McCONNELL. Thank you, Mr. Chairman.

With your permission, I will read the blue-line part of the statement, and I make the assumption the entire statement will be made a part of the record.

Senator STENNIS. Mr. Reporter, you make the entire statement a part of the record.

(The statement referred to follows:)

STATEMENT BY GEN. JOHN P. McCONNELL, CHIEF OF STAFF, U.S. AIR FORCE

BIOGRAPHICAL SKETCH

John Paul McConnell was born on 7 February 1908 in Booneville, Arkansas. He attended Booneville public schools and Henderson-Brown College (now Henderson State) at Arkadelphia, Arkansas, graduating in 1927 with a Bachelor of Science degree (Magna Cum Laude). Appointed to the U.S. Military Academy the following year, he graduated in June 1932 and was commissioned a Second Lieutenant in the Field Artillery, Regular Army. He entered Primary Flying School at Randolph Field, Texas, in July of that year and completed Advanced Flying School at Kelly Field, Texas, in October 1933. After graduation he was assigned to the 20th Pursuit Group at Barksdale Field, Louisiana. In June 1937 he moved to the 50th Observation Squadron and served with that unit at both Luke Field and Hickam Field, Hawaii. Transferred to the Training Center at Maxwell Field, Alabama, in 1939, he performed a variety of squadron and post duties.

After serving from January until May 1942 in the Office of the Chief of Air Forces, Colonel McConnell moved to Headquarters AAF Technical Training Command at Knollwood, N.C., eventually assuming duty as its Chief of Staff. In September 1943 he was named Deputy Chief of Staff, Headquarters AAF Training Command at Fort Worth, Texas. Two months later he became Chief of Staff of the China-Burma-India Air Force Training Command (provisional) at Karachi, India.

He became Senior Air Staff Officer in the Third Tactical Air Force, Comilla, India, CBI Theater of Operations, in February 1944. The next month he became Deputy Commander of the Integrated USAAF-RAF Third Tactical Air Force. From here General McConnell went to Kandy, Ceylon, to serve with the Southeast Asia Air Command under Admiral Mountbatten. After the fall of Rangoon and the consequent transfer of USAAF Headquarters (India-Burma Theater) to China, General McConnell served as its Chief of Staff until inactivation of Army Air Forces in China.

In April 1946 he was selected to command the Air Division Nanking Headquarters Command, and also to act as Advisor to the Chinese Government. He returned in June 1947 to Air Force Headquarters in Washington to become Chief of the Reserve and National Guard Division of the Air Force. In May 1948 he was named Chief of the Civilian Components Group at Air Force Headquarters and in December 1948 assumed the position of Deputy Special Assistant to the Chief of Staff, USAF Reserve Forces.

In 1950 General McConnell was named Deputy Commander of the Third Air Division (England) and promoted to Major General. When that unit was elevated to the designation of Third Air Force in May 1951, General McConnell retained his position until taking command later that month of the 7th Air Division (England). On 8 April 1953 he was appointed Director of Plans, SAC Headquarters, a position he filled until November 1957, at which time he returned to Barksdale Air Force Base to head the Second Air Force. On 1 August 1961, General McConnell became Vice-Commander-in-Chief of the Strategic Air

Command where he remained until September 1962 when he was chosen to be Deputy Commander-in-Chief, United States European Command. He left that post in August 1964 to take over duties as Vice Chief of Staff, USAF, serving in that capacity until February 1965, at which time he was appointed Chief of Staff.

I. INTRODUCTION

Mr. Chairman and members of the subcommittee, I am pleased to meet with you and discuss the Air Force role in maintaining the strategic posture of the United States.

Briefly stated, our strategic objective is deterrence of aggression at any level, with emphasis on deterrence of strategic nuclear attack on the United States. Should deterrence fail, the principal objective of U.S. military strategy is to terminate hostilities with a clear advantage over any aggressor while limiting damage to the United States and its allies and to United States interests abroad.

To be effective, a deterrent must be credible to the enemy and relevant to his objectives and values. This means that the United States must be known to possess a level and mix of strategic offensive and defensive forces which will assure unacceptable damage to any state or combination of states even after withstanding an attack.

Since deterrence results from an enemy's evaluation, questions arise when we attempt to translate this into specific force requirements. First, there is the question as to what levels of potential destruction an enemy would consider unacceptable. We can set goals in terms of total fatalities, urban fatalities, or industrial floor space destroyed; however, whether the prospect of such losses will keep an enemy from attacking under all circumstances is a subjective judgment which cannot be tested.

Moreover, an assessment of relative military capabilities is exceedingly complex, uncertain, and controversial. It is complex because so many variables enter into the assessment of military capabilities and because military technology is advancing so rapidly and on so many fronts. Even for the present, many of these variables are subject to wide ranges of estimates. For enemy forces there are questions as to their quality and quantity and the tactics that might be used in employing them. Even for our own forces there are variables, and we assign a range of values to survivability, reliability, accuracy, and penetration capability under various conditions of nuclear war.

To cover the range of uncertainty, U.S. strategic forces must possess such a clear margin of safety that no opponent could ever mistakenly estimate that he would succeed with a strategic attack on the U.S. This capability should be clearly obvious to the enemy.

This is why we maintain a mix of strategic offensive forces designed to operate effectively over a broad spectrum of possible contingencies. In my opinion this mix should include a combination of manned aircraft and land and sea based missiles to permit a range of options at varying attack intensities against alternative target systems. A mix such as this means that the enemy must diversify and thus dilute his defense efforts. This permits us the option of exploiting his weak areas and avoiding his strengths.

A similar mix of defensive forces is required. Balanced active and passive defenses in depth are necessary for protection against all elements of the threat, whether those elements are employed selectively or simultaneously. In addition, our defensive efforts complicate enemy strategic planning and make his strategic efforts more costly.

Taken together, our strategic forces must have an assured capability over the collective capability of the Soviet Union, the Chinese Communists, or any combination of hostile states.

II. THREAT

I realize that the Committee has received a number of excellent presentations on the threat. However, I would like to take a few minutes to highlight some of the more significant aspects of the Soviet strategic forces and the developing Red Chinese strategic threat.

First, there is the rapidly growing Soviet ICBM force. According to accepted estimates, Soviet operational ICBM launchers totaled some 720 in October 1967, more than double the 340 of a year earlier. By the end of 1968, the Soviets will reach approximate numerical parity with the United States in numbers of ICBM launchers. By mid-1972 it is estimated they will have between [deleted] ICBM launchers, with improvements in both accuracy and reliability.

The Soviets have been testing a Fractional Orbit Bombardment System. [Deleted.] The FOBS, which the Soviets may consider useful in a surprise nuclear strike against our bomber bases or as a penetration tactic against ABM systems, could be operational by now.

Also a threat to the U.S. is the Soviet submarine launched missile force. [Deleted.]

The threat to our allies and to U.S. interests abroad includes the Soviet medium range and intermediate range ballistic missile force of more than 700 launchers, some of which are in hardened facilities. [Deleted.] thus, the total MRBM and IRBM threat is about [deleted] missiles having a range of up to about [deleted].

Soviet Long Range Aviation consists of [deleted] bombers, including [deleted] heavy BISON and BEAR aircraft and [deleted] medium bombers. The medium force includes the supersonic BLINDER B which carries a [deleted] air-to-surface missile with a [deleted] range.

[Deleted] approximately [deleted] heavy bomber aircraft are available to the Soviets for initial attack on the U.S. In addition, it is my belief that approximately [deleted] medium bombers would also be used against the U.S. in a major nuclear assault. The Soviet bomber force is an important part of the Soviet strike force, and in my judgment will continue to be in the future.

[Deleted] the Soviets are expected to achieve an initial ballistic missile defense around Moscow [deleted].

In further attempts to limit the damage that we could inflict on them, the Soviets are continuing to improve their defenses against aircraft. [Deleted.] An advanced supersonic fighter, the FOXBAT, capable of about [deleted] is expected to be operational as a [deleted]. Further improvements may be expected during the 1975 time period [deleted].

Presently deployed Soviet SAM systems are estimated to have little capability below approximately [deleted]. As long as we maintain a bomber force capable of surviving an initial attack and capable of penetrating [deleted] (as our present bomber force can), the Soviets have the requirement to develop and deploy a low altitude terminal bomber defense for their important targets. [Deleted.]

The TALLINN [deleted] system deployment continues. Intelligence estimates currently consider the [deleted] a SAM system with a significant capability against aircraft and air-to-surface missiles [deleted]. However, current evidence does not dispel entirely the possibility that the TALLINN system is being deployed to counter both aerodynamic and some ballistic missile threats. This is the sort of uncertainty I referred to earlier, and which requires that we develop forces to cover a wider range of possibilities.

The improvements in the Soviet strategic offensive and defensive forces have not been at the expense of their other forces. The Soviets have modernized their forces in Central Europe, including the provision of a formidable tactical nuclear capability. In addition, they have been gradually increasing the reach of their conventional military forces. In recent years they have developed forces which, while probably intended for the general war mission, now provide them with improved capabilities for distant limited operations.

Communist China has tested seven nuclear devices. [Deleted] of these devices, one of which yielded [deleted] megatons, were delivered by aircraft, and one was delivered by ballistic missile [deleted]. They are also pursuing a vigorous ballistic missile development program. A limited deployment of medium range ballistic missiles is expected to begin [deleted], and an ICBM system could be ready for deployment in the early 1970s.

To summarize the threat, our security is being increasingly challenged by the improving strategic forces of the Soviet Union and their associated technological programs. While this improved Soviet strategic posture is unlikely to increase their willingness to risk nuclear war with the U.S., the Soviet leaders may well take a tougher position where a direct conflict of interests develops. They may also view their improved strategic posture as reinforcing deterrence to the point that they can intervene in third areas of the world with reduced risk of U.S. opposition. The entry of Communist China into the group of nuclear-armed nations further complicates the complex problem of strategic balance.

Intelligence estimates have not proven fully reliable in the past. In the future, the variations of these estimates may be even greater, because it is inherently more difficult to obtain reliable information on qualitative changes than to discern quantitative differences. When viewed in the light of the range of uncertainties in our knowledge of enemy capabilities and intentions, the growing threat emphasizes the point that we must maintain a clear margin of strategic

superiority and the resultant flexibility to respond with alternative courses of action.

III. STRATEGIC OFFENSIVE FORCES

Turning now to our own strategic forces, let me comment briefly on the measures underway to offset the Soviet advances. In our strategic offensive forces, the missile-bomber mix has shifted toward increased dependence on missiles as the missile force has completed the buildup to its programmed strength.

Our current missile force includes 54 TITAN IIs and 1,000 MINUTEMAN Is and IIs. The TITAN can deliver the largest warhead in the missile force and is equipped with penetration aids [deleted]. The TITAN will continue at the present force level of 54 missiles through [deleted] after which a gradual phase-down is planned [deleted].

The MINUTEMAN force reached its current level of 1,000 missiles in April 1967. In FY 1967 we began replacing a part of the MINUTEMAN I force with the MINUTEMAN II missiles, and this program of modernization is continuing.

In [deleted] we plan to deploy the MINUTEMAN III in the force, and by [deleted] it will be deployed at the rate of approximately [deleted] missiles per year. We will continue this buildup until a level of [deleted] is reached by [deleted]. The initial MINUTEMAN III increments will be used to replace the remaining MINUTEMAN I as another step in the modernization program. That program will also include improvements in the launch control centers and launch facilities to insure their compatibility with MINUTEMAN II and III.

The MINUTEMAN III offers significant improvements over the earlier MINUTEMAN I and II and is a near term measure to offset the increasing Soviet threat. With an improved third stage motor, the MINUTEMAN III will be capable of a throw weight [deleted] of MINUTEMAN I and [deleted] pounds more than MINUTEMAN II, with a projected circular error probable of about [deleted]. The improvements incorporated in MINUTEMAN III will enable it to carry multiple independently targetable reentry vehicles in addition to penetration aids such as chaff and decoys.

To further enhance the effectiveness of our missile force we have begun the design and development of a [deleted] hard silo. We refer to these hardened facilities as dual-capable silos, because they are designed to house the MINUTEMAN III initially, but will also be capable of accepting an Advanced ICBM. The launch control facility in this configuration will be hardened to [deleted]. These steps will enable us to deploy MINUTEMAN III in the dual capable silos by [deleted].

To meet the longer term threat, Air Force studies conclude that an Advanced ICBM will be required. This advanced missile should have greatly increased throw weight over MINUTEMAN III, [deleted] and a circular error probable of less than [deleted]. With a decision to go ahead, these missiles would be based in the [deleted] hard silos previously described. We believe that the greater payload, improved survivability, and increased accuracy of the Advanced ICBM are required to meet the threat of the late 1970s and beyond. We have recommended initiating Contract Definition in [deleted].

Turning now to the bomber force, the manned component of our strategic forces is unique in providing vital capabilities for flexible, discriminating and highly controllable actions responsive to a changing combat environment and to the decisions of our national command authority. The versatility of our bomber force is being demonstrated today. The bombers on nuclear alert are a vital part of our deterrent. The B-52s in Southeast Asia demonstrate daily their important role in nonnuclear warfare supporting the ground forces.

As I mentioned before the Armed Services Committee this year, we are closely monitoring the phasedown of the older series B-52s in light of the changing world situation. We plan to phaseout the B-52C through F series as the FB-111 is deployed. However, we continue to examine the requirement for retaining some of these B-52s in support of Southeast Asia.

As a means of retaining a sufficient number of B-52s in operation, we are carrying out limited modification programs to extend their service life. These programs include a wing modification program for all B-52Ds and a limited number of B-52Es and Fs. This relatively inexpensive modification (approximately \$140,000 per aircraft) may be applied to additional B-52E and F series if required to maintain more B-52s than presently planned. We are also continuing modifications to the B-52G and H force, including installation of a Stability

Augmentation System to reduce structural loads, which should extend the service life of these series into the late 1970s.

Our FB-111 program is progressing satisfactorily. Fourteen squadrons of this new medium bomber are planned to be operational by the end of FY 72. The FB-111s will replace both the B-52C through F series and the two wings of B-58s. The force of 76 B-58s is scheduled to be phased out in FY 71; however, as in the case of the B-52 phasedown, we are monitoring this closely based on strategic force requirements and attaining the operational capability of the FB-111. We are convinced that the FB-111 continues to be the logical step for timely modernization of this element of the strategic bomber force.

To accomplish the strategic tasks in the future, I believe that the bomber force must have improved capabilities over those presently programmed. The credible deterrent of which I spoke earlier requires a force which can survive an initial attack, continue to survive throughout the duration of a conflict, and be capable of penetrating even the improved enemy defenses postulated for the future. This requires a payload capacity which includes the required advanced penetration aids as well as the weapons to destroy enemy targets. It requires a much higher order of reliability than bombers thus far developed to allow self-sufficiency and a minimum of maintenance when operating from dispersed sites.

The Advanced Manned Strategic Aircraft which we are proposing as replacement for the B-52Gs and Hs will have these capabilities. The AMSA will also have the long range, high performance, large payload, and improved accuracy to perform highly versatile nonnuclear as well as nuclear roles. In nonnuclear conflicts or sustained nuclear wars, these capabilities translate into fewer sorties required, fewer losses, and increased effectiveness and consequently greater ability to control the nature and level of the conflict.

Our analyses have shown that a mix of missiles and bombers has cost effectiveness advantages over a pure force of either in maintaining an assured destruction capability. A bomber force causes the Soviets to continue to develop bomber defenses rather than concentrating their expenditures just on missile defenses. Bombers are a hedge against unexpected effectiveness of existing Soviet threats or deployment of advanced threats which may degrade our missile force capability. Bombers can effectively accomplish a majority of the assured destruction task and are effective in the damage limiting role as well.

For the reasons I have mentioned we need to continue the development of the airframe, propulsion, avionics and penetration aids technology that an AMSA would require. The next logical step, which the JCS, and I have recommended, is to initiate Contract Definition in FY 69. This action would reduce the lead time to providing an operational AMSA and would furnish data on which to make subsequent development and deployment decisions.

Even with a decision to initiate Contract Definition in FY 69, the earliest we could have AMSA in our bomber force would be late in FY 76. As I mentioned earlier, however, we are taking steps to ensure that the service life of the B-52G and H force will extend through the late 1970s. In addition, to counter the improving Soviet defenses we must maintain the penetration capability for our bomber force until AMSA is available. To accomplish the latter, we are currently taking measures to improve the reliability of our HOUND DOG air-to-surface missiles through a special inspection and repair program. We are also modifying [deleted] B-52Hs to carry the Short Range Attack Missile (SRAM). These missiles will provide us with the capability to stand off and suppress Soviet low altitude SAM defenses estimated for the early 1970s. SRAM is effective against a variety of other targets as well. Therefore, I have recommended that we equip all B-52G and H units with SRAM.

I think it is important to mention that we are requesting the SRAM to complement and supplement rather than replace HOUND DOG. Each of these air-to-surface missiles has unique characteristics and capabilities which place unusual demands on the enemy defense environment, the HOUND DOG having longer range and much larger yield, the SRAM having greater accuracy, and improved penetration capability [deleted].

Even the combination of SRAM and HOUND DOG may be inadequate to cope with the area air defense environment estimated for the Soviet Union in the 1970s. If the Soviets deploy an airborne warning and control system and improved interceptors [deleted] then we must provide new and imaginative means of countering these defenses. Among the penetration aids we are currently considering are [deleted]. These advanced penetration aids, as well as SRAM, are also planned for the AMSA.

IV. STRATEGIC DEFENSIVE FORCES

Our strategic defensive forces add to the deterrent posture of the U.S. by introducing uncertainty into the enemy's planning, compounding his targeting problems and causing him to divert resources from other essential tasks. If deterrence fails, we must place heavy reliance on our defense forces to carry out their classic role of assisting in limiting damage to our country. To function effectively, therefore, our defensive forces must keep pace with the changing aircraft, missile and space threats.

We recognize the deficiencies in our present air defense forces and are attempting to overcome them. Among these deficiencies are the vulnerability of our control and warning systems to enemy defense suppression attacks and our marginal interceptor capability against a low altitude bomber or air-to-surface missile attack. The possible improvements in the Soviet bomber force, including a new longer range supersonic medium bomber [deleted], and the expected improved air-to-surface missiles could further reduce our capability to limit damage to the U.S.

Among the measures underway to correct these deficiencies are improvements in our control and warning system. The survivability of the radar and control network, which is so closely related to the interceptor and its effectiveness, has been improved with the activation of fourteen automated Backup Interceptor Control Centers (BUIC). We will further improve this backup net by late 1969 with the installation of BUIC III at thirteen sites in the U.S. and two additional sites. These improvements will increase the survivability of the command and control system against defense suppression attack.

We are continually seeking means to preserve the effectiveness and flexibility of the fighter interceptor force. For example, we are modifying the F-106's to provide an air refueling capability. Thus, they could be employed in reaction to world-wide contingencies and provide air defense protection for our forces deployed overseas. This capability was demonstrated with the deployment of the 318th Fighter Interceptor Squadron to Korea in February. However, these improvements in the radars and control systems and in the interceptor force will still leave shortcomings.

To overcome these, the Air Force has developed a concept for an improved air defense system capable of destroying the enemy's air-breathing vehicles before they approach striking range of the target areas. This system will include three major elements: an improved interceptor, an Airborne Warning and Control System, and an Over-the-Horizon Radar.

Following considerable analysis of the CONUS air defense problem, we concluded that significant improvement could be achieved through a major modification of the F-106 interceptor. This modification would provide a look-down radar and air-to-air missiles capable of attacking bombers penetrating at low altitude. Our analyses also concluded that the air defense capability could be improved even more with the addition of a few improved manned interceptors such as the F-12, particularly if qualitative improvements in the Soviet bomber threat develop.

The second major element of the improved air defense system is the Airborne Warning and Control System, called AWACS. This system, when deployed, will improve the effectiveness of our interceptor forces regardless of type. The AWACS will incorporate a long endurance capability to provide a highly survivable system, and will be capable of quick reaction and rapid deployment [deleted]. This mobility would make the AWACS virtually immune to destruction by a surprise attack.

We have completed the conceptual studies for AWACS and have accomplished the initial demonstration of the radar techniques that are being considered for this system. The techniques we are developing should meet the requirements for directing interceptors to kill positions before the attacking bombers can release their air-to-surface missiles or approach our target areas.

Working in conjunction with and complementing the improved interceptor and the AWACS will be Over-the-Horizon backscatter radars. These radars, [deleted] will provide a detection capability far beyond the horizon. Typically, these radars would have the ability to detect targets from the surface of the earth to the ionosphere at ranges as great as [deleted] nautical miles.

With this OTH backscatter radar we can deny the enemy the advantage of surprise by undetected approach to our defended areas. This radar will also give us early detection of submarine launched cruise missiles [deleted]. Additional capabilities of the OTH radars are the acquisition of target data for position-

ing of long-range interceptors and the detection of sea-launched ballistic missiles.

Until such time as the AWACS and OTH backscatter systems are deployed and in operation, I think it is essential that we retain most of our existing Command and Control system. This system, comprising surveillance radars, gap filler radars and control centers, must possess sufficient redundancy to provide an adequate control capability after absorbing a nuclear defense-suppression attack. It is also necessary that we maintain sufficient ground environment facilities to provide a control capability over all U.S. airspace. Once the new systems are available it will be possible to eliminate the redundancy feature of our current system without risk.

To summarize my position on CONUS air defense, I believe that: the number of lives that could be saved by effective bomber defenses argues for such a damage limiting capability; we now have the technological capability to overcome the major deficiencies in our existing defense system with the AWACS, the OTH program, and an interceptor with a look-down, shoot-down capability; and finally, most of our present interceptor squadrons and ground environment facilities, though far from perfect, should be retained to provide the maximum defense available at reasonable cost until improved systems are actually deployed.

Our efforts to stay abreast of the growing missile threat have brought continued improvement in the reliability and capability of our warning systems. Currently, however, the BMEWS continues to provide our primary warning of attack by ICBMs. To provide warning from the threat of a Soviet Fractional Orbit Bombardment System—FOBS—we are advancing our OTH forward scatter system [deleted] to provide an interim operational capability in [deleted] while still in research and development status.

[Deleted.]

V. SUMMARY

In conclusion, I would like to mention again that we are facing a rapidly growing and constantly improving threat. It includes a strong capability for surprise attack that is augmented by a continuing, vigorous, and well-organized research and development effort. It includes new forces in being, both offensive and defensive. It portends the possibility that new technological developments can appear with only minimal warning.

In responding to all elements of this threat and the range of uncertainties therein, we are most concerned with those actions necessary to maintain a clear margin of strategic superiority and resultant flexibility to respond with alternative courses of action in any crisis. To provide this requires continued emphasis on the qualitative and quantitative improvement of our forces. It requires the efficient allocation of existing forces, and it requires a strong underlying research program for imaginative development of new forces.

Gentlemen, I appreciate the opportunity to appear before this Committee. This completes my prepared remarks.

Thank you very much.

General McCONNELL. Mr. Chairman, members of the subcommittee, I am pleased to meet with you and discuss the Air Force role in maintaining the strategic posture of the United States.

Briefly stated, our strategic objective is deterrence of aggression at any level, with emphasis on deterrence of strategic nuclear attack on the United States. Should deterrence fail, the principal objective of U.S. military strategy is to terminate hostilities with a clear advantage over any aggressor while limiting damage to the United States and its allies and to U.S. interests abroad.

Since deterrence results from an enemy's evaluation, questions arise when we attempt to translate this into specific force requirements. First, there is the question as to what levels of potential destruction an enemy would consider unacceptable. We can set goals in terms of total fatalities, urban fatalities, or industrial floorspace destroyed; however, whether the prospect of such losses will keep an enemy from attacking under all circumstances is a subjective judgment which cannot be tested.

Moreover, an assessment of relative military capabilities is exceedingly complex, uncertain, and controversial. It is complex because so many variables enter into the assessment of military capabilities and because military technology is advancing so rapidly and on so many fronts. Even for the present, many of these variables are subject to wide ranges of estimates. For enemy forces there are questions as to their quality and quantity and the tactics that might be used in employing them. Even for our own forces there are variables, and we assign a range of values to survivability, reliability, accuracy, and penetration capability under various conditions of nuclear war.

To cover the range of uncertainty, U.S. strategic forces must possess such a clear margin of safety that no opponent could ever mistakenly estimate that he would succeed with a strategic attack on the United States. This capability should be clearly obvious to the enemy.

This why we maintain a mix of strategic offensive forces designed to operate effectively over a broad spectrum of possible contingencies. In my opinion this mix should include a combination of manned aircraft and land- and sea-based missiles to permit a range of options at varying attack intensities against alternative target systems.

A similar mix of defensive forces is required. Balanced active and passive defenses in depth are necessary for protection against all elements of the threat, whether those elements are employed selectively or simultaneously.

According to accepted estimates, Soviet operational ICBM launchers totaled some 720 in October 1967, more than double the 340 of a year earlier. By the end of 1968, the Soviets will reach approximate numerical parity with the United States in numbers of ICBM launchers.

The Soviets have been testing a Fractional Orbit Bombardment System. [Deleted.] The FOBS, which the Soviets may consider useful in a surprise nuclear strike against our bomber bases or as a penetration tactic against ABM systems, could be operational by now.

Also a threat to the United States is the Soviet submarine-launched missile force. [Deleted.]

The threat to our allies and to U.S. interests abroad includes the Soviet medium-range and intermediate-range ballistic missile force [deleted].

Soviet long-range aviation consists of [deleted] bombers, including [deleted] heavy BISON and BEAR aircraft and [deleted] medium bombers. The medium force includes the supersonic BLINDER B which carries a [deleted] air-to-surface missile with a [deleted] range.

[Deleted] approximately [deleted] heavy bomber aircraft are available to the Soviets for initial attack on the United States. In addition, it is my belief that approximately [deleted] medium bombers would also be used against the United States in a major nuclear assault. The Soviet bomber force is an important part of the Soviet strike force, and in my judgment will continue to be in the future.

[Deleted], the Soviets are expected to achieve an initial ballistic missile defense around Moscow [deleted].

In further attempts to limit the damage that we could inflict on them, the Soviets are continuing to improve their defenses against aircraft. [Deleted] this new system will significantly improve the Soviet air

defenses. An advanced supersonic fighter, the FOXBAT, capable of about [deleted] is expected to be operational as a [deleted].

The TALLINN [deleted] system deployment continues. Intelligence estimates currently consider the [deleted] a SAM system with a significant capability against aircraft and air-to-surface missiles [deleted]. However, current evidence does not dispel entirely the possibility that the TALLINN system is being deployed to counter both aerodynamic and some ballistic missile threats. This is the sort of uncertainty I referred to earlier, and which requires that we develop forces to cover a wider range of possibilities.

The improvements in the Soviet strategic offensive and defensive forces have not been at the expense of their other forces. The Soviets have modernized their forces in Central Europe, including the provision of a formidable tactical nuclear capability. In addition, they have been gradually increasing the reach of their conventional military forces. In recent years they have developed forces which, while probably intended for the general war mission, now provide them with improved capabilities for distant limited operations.

To summarize the threat, our security is being increasingly challenged by the improving strategic forces of the Soviet Union and their associated technological programs. While this improved Soviet strategic posture is unlikely to increase their willingness to risk nuclear war with the United States, the Soviet leaders may well take a tougher position where a direct conflict of interests develops. They may also view their improved strategic posture as reinforcing deterrence to the point that they can intervene in third areas of the world with reduced risk of U.S. opposition. The entry of Communist China into the group of nuclear-armed nations further complicates the complex problem of strategic balance.

In our strategic offensive forces, the missile-bomber mix has shifted toward increased dependence on missiles as the missile force has completed the building to its programmed strength.

The MINUTEMAN force reached its current level of 1,000 missiles in April 1967. In fiscal year 1967 we began replacing a part of the MINUTEMAN I force with the MINUTEMAN II missiles, and this program of modernization is continuing.

[Deleted] we plan to deploy the MINUTEMAN III in the force.

The MINUTEMAN III offers significant improvements over the earlier MINUTEMAN I and II and is a near-term measure to offset the increasing Soviet threat. With an improved third-stage motor, the MINUTEMAN III will be capable of a throw weight [deleted] of MINUTEMAN I and [deleted] pounds more than MINUTEMAN II, with a projected circular error probable of about [deleted]. The improvements incorporated in MINUTEMAN III will enable it to carry multiple independently targetable reentry vehicles in addition to penetration aids such as chaff and decoys.

To further enhance the effectiveness of our missile force we have begun the design and development of a [deleted] hard silo. We refer to these hardened facilities as dual-capable silos, because they are designed to house the MINUTEMAN III, initially, but will also be capable of accepting an Advanced ICBM. The launch control facility in

this configuration will be hardened [deleted]. These steps will enable us to deploy MINUTEMAN III in the dual-capable silos by [deleted].

To meet the longer term threat, Air Force studies conclude that an Advanced ICBM will be required. This advanced missile should have greatly increased throw weight over MINUTEMAN III, [deleted] and a circular error probable of less than [deleted]. With a decision to go ahead, these missiles would be based in the [deleted] hard silos previously described. We believe that the greater payload, improved survivability, and increased accuracy of the Advanced ICBM are required to meet the threat of the late 1970's and beyond. We have recommended initiating contract definition [deleted].

As I mentioned before the Armed Services Committee this year, we are closely monitoring the phasedown of the older series B-52's in light of the changing world situation. We plan to phase out the B-52C through F series as the FB-111 is deployed. However, we continue to examine the requirement for retaining some of these B-52's in support of Southeast Asia.

Our FB-111 program is progressing satisfactorily. Fourteen squadrons of this new medium bomber are planned to be operational by the end of fiscal year 1972. The FB-111's will replace both the B-52C through F series and the two wings of B-58's. The force of 76 B-58's is scheduled to be phased out in fiscal year 1971; however, as in the case of the B-52 phasedown, we are monitoring this closely, based on strategic force requirements and attaining the operational capability of the FB-111. We are convinced that the FB-111 continues to be the logical step for timely modernization of this element of the strategic bomber force.

To accomplish the strategic tasks in the future, I believe that the bomber force must have improved capabilities over those presently programmed. The credible deterrent of which I spoke earlier requires a force which can survive an initial attack, continue to survive throughout the duration of a conflict, and be capable of penetrating even the improved enemy defenses postulated for the future. This requires a payload capacity which includes the required advanced penetration aids as well as the weapons to destroy enemy targets.

Our analyses have shown that a mix of missiles and bombers has cost effectiveness advantages over a pure force of either in maintaining an assured destruction capability. A bomber force causes the Soviets to continue to develop bomber defenses rather than concentrating their expenditures just on missile defenses. Bombers are a hedge against unexpected effectiveness of existing Soviet threats or deployment of advanced threats which may degrade our missile force capability. Bombers can effectively accomplish a majority of the assured destruction task and are effective in the damage limiting role as well.

For the reasons I have mentioned we need to continue the development of the airframe, propulsion, avionics, and penetration aids technology that an AMSA would require. The next logical step, which the JCS and I have recommended, is to initiate contract definition in fiscal year 1969.

We are currently taking measures to improve the reliability of our HOUND DOG air-to-surface missiles through a special inspection and repair program. We are also modifying [deleted] B-52H's to carry

the Short Range Attack Missile (SRAM). These missiles will provide us with the capability to stand off and suppress Soviet low-altitude SAM defenses estimated for the early 1970's. SRAM is effective against a variety of other targets as well. Therefore, I have recommended that we equip all B-52G and H units with SRAM.

Even the combination of SRAM and HOUND DOG may be inadequate to cope with the area air defense environment estimated for the Soviet Union in the 1970's. If the Soviets deploy an airborne warning and control system and improved interceptors [deleted], then we must provide new and imaginative means of countering these defenses. Among the penetration aids we are currently considering are [deleted]. These advanced penetration aids, as well as SRAM, are also planned for the AMSA.

Let me turn to the strategic defensive forces.

Our strategic defensive forces add to the deterrent posture of the United States by introducing uncertainty into the enemy's planning, compounding his targeting problems and causing him to divert resources from other essential tasks. If deterrence fails, we must place heavy reliance on our defense forces to carry out their classic role of assisting in limiting damage to our country. To function effectively, therefore, our defensive forces must keep pace with the changing aircraft, missile, and space threats.

We recognize the deficiencies in our present air defense forces and are attempting to overcome them. [Deleted.] The possible improvements in the Soviet bomber force, including a new longer range supersonic medium bomber [deleted] and the expected improved air-to-surface missiles could further reduce our capability to limit damage to the United States.

The Air Force has developed a concept for an improved air defense system capable of destroying the enemy's air-breathing vehicles before they approach striking range of the target areas. This system will include three major elements: An improved interceptor, an airborne warning and control system, and an over-the-horizon radar.

Following considerable analysis of the CONUS air defense problem, we concluded that significant improvement could be achieved through a major modification of the F-106 interceptor. This modification would provide a look-down radar and air-to-air missiles capable of attacking bombers penetrating at low altitude. Our analyses also concluded that the air defense capability could be improved even more with the addition of a few improved manned interceptors such as the F-12, particularly if qualitative improvements in the Soviet bomber threat develop.

The second major element of the improved air defense system is the airborne warning and control system, called AWACS. This system, when deployed, will improve the effectiveness of our interceptor forces regardless of type. The AWACS will incorporate a long-endurance capability to provide a highly survivable system, and will be capable of quick reaction and rapid deployment [deleted]. This mobility would make the AWACS virtually immune to destruction by a surprise attack.

Working in conjunction with and complementing the improved interceptor and the AWACS will be over-the-horizon backscatter radars. These radars, [deleted], will provide a detection capability far

beyond the horizon. Typically, these radars would have the ability to detect targets from the surface of the earth to the ionosphere at ranges as great as [deleted] nautical miles.

To summarize my position on CONUS air defense, I believe that: The number of lives that could be saved by effective bomber defenses argues for such a damage-limiting capability; we now have the technological capability to overcome the major deficiencies in our existing defense system with the AWACS, the OTH program, and an interceptor with a look-down, shoot-down capability; and finally, most of our present interceptor squadrons and ground environment facilities, though far from perfect, should be retained to provide the maximum defense available at reasonable cost until improved systems are actually deployed.

Mr. Chairman, with your permission, since there has been some discussion as to whether or not there will be a real bomber threat, I would like to insert at this point another thought.

I would like to insert here a statement on the recent Soviet long-range bomber activity in the vicinity of North America. In my opinion, that activity is clear evidence of the importance the Soviets attach to their bomber force.

Clear evidence of increased Soviet interest in strategic air operations has been provided in the past 3 months by an unprecedented "show of force" bomber flights closely approaching the North American mainland. [Deleted.]

Our efforts to stay abreast of the growing missile threat have brought continued improvement in the reliability and capability of our warning systems. Currently, however, the BMEWS continues to provide our primary warning of attack by ICBM's. To provide warning from the threat of a Soviet fractional orbit bombardment system (FOBS); we are advancing our OTH forward scatter system [deleted] to provide an interim operational capability in [deleted] while still in research and development status.

[Deleted.]

In conclusion, I would like to mention again that we are facing a rapidly growing and constantly improving threat.

In responding to all elements of this threat and the range of uncertainties therein, we are most concerned with those actions necessary to maintain a clear margin of strategic superiority and resultant flexibility to respond with alternative courses of action in any crisis. To provide this requires continued emphasis on the qualitative and quantitative improvement of our forces. It requires the efficient allocation of existing forces, and it requires a strong underlying research program for imaginative development of new forces.

Gentlemen, I appreciate the opportunity to appear before this committee. This completes my prepared remarks.

Thank you very much.

Senator STENNIS. All right. We certainly have some questions for you, General. That is a good statement. We are delighted to have you here.

Now, as I understood, you consider these two statements complement each other—each complements the other.

Dr. BROWN. Yes, sir.

Senator STENNIS. And you would like to proceed.

Senator Miller, could you stay long enough to hear the Secretary?

All right, Mr. Secretary.

Senator SYMINGTON. Mr. Chairman, I have read Secretary Brown's statement. If you excuse me, I will be back in about 10 minutes.

Senator MILLER. May I be excused for the same reason, Mr. Chairman? I have read this statement, and I have my questions prepared. I will be back in 10 minutes or less.

Senator STENNIS. Thank you, sir.

STATEMENT OF DR. HAROLD BROWN, SECRETARY OF THE AIR FORCE

Dr. BROWN. Mr. Chairman, members of the subcommittee; Secretary McNamara, General McConnell, and I have described Air Force programs in detail in the fiscal year 1969 authorization hearings. I now would like to discuss more fully several of the difficult points of judgment involved in strategic force decisions.

Let me state my principal judgments at the outset. The Soviet strategic threat is indeed serious and shows no sign of melting away. Present and future Soviet capabilities are such that any all-out thermonuclear war would inflict unacceptable damage on both the United States and the U.S.S.R.

Senator STENNIS. In spite of the best defenses.

Dr. BROWN. Yes, sir; if the Soviets plan well, they will be able to inflict unacceptable damage on us. The amounts on each side will depend on the defenses on both sides. And if the Soviets exercise good planning, nothing we can do in the foreseeable future will reduce our own expected damage to an acceptable level. However, the wide range of developments which we have underway is well designed to insure that we can continue to deter a nuclear attack against us whatever route the Soviets—or the Communist Chinese—elect to take. In particular, these actions will allow us to maintain a more secure and effective strategic capability against the Soviets than they could use against us, and an effective damage-limiting capability against the Communist Chinese into the 1980's. We must modernize our bomber defenses in the face of a continuing Soviet bomber threat. And if Soviet forces continue to increase, I believe we will wish to undertake full-scale development of an advanced bomber, and to update our land-based missile force.

To insure deterrence, we must be able to inflict an unacceptable level of damage on the Soviets after we have absorbed a Soviet first-strike. Exactly what that level is will depend on the judgments of enemy leaders about the outcome of actual war. Mr. McNamara, in his recent posture testimony, stated that the question could not be answered precisely, but judged that a capability to destroy 20 to 25 percent of the Soviet population and 50 percent of her industry should serve as an effective deterrent.

Of course, even 25 percent Soviet casualties might not be enough for deterrence if U.S. casualties were disproportionately higher—if the Soviets thought they would be able to recover in some period of time while the United States would take three or four times as long, or would never recover, then the Soviets might not be deterred.

Consequently, in addition to the basic deterrent capability to eliminate some fraction, such as 25 percent of the Soviet population in retaliation, our measurement of deterrence should include two other criteria, less central but still important: (1) ratios of surviving population and industry must not be badly adverse to the United States, and (2) the surviving military balance should remain in our favor. U.S. forces that can guarantee these results should be sufficient to deter attack and inhibit nuclear blackmail even in crisis situations. And if deterrence should fail, a favorable surviving military balance could make it easier for us to negotiate an end to the war and limit further damage to the United States.

Having said all that, I want to reiterate that an all-out thermonuclear war would be so catastrophic for both sides that its threat, that is, the threat of initiating such a war, cannot be used with any confidence to deter actions less than the massive use of nuclear weapons on the United States or its NATO allies.

It is most unlikely that the U.S.S.R. could bring a new weapon system to operational status without our knowing about it. For example, if the Soviets decided to [deleted] they would need [deleted] of development time before getting an initial operational capability. We could probably detect [deleted] and could then make adjustments in our own forces. These adjustments need not always take the form of new weapons. We also can increase our own numbers of proven weapons, or we can take advantage of available options to increase their capability.

The United States maintains both a bomber force and a missile force—either of which alone could at the present time guarantee adequate deterrence. Therefore, each provides insurance against degradation of the other as a result of unexpected Soviet developments. The chance that the Soviets could eliminate either our bombers or our missiles is negligible at present. Our alert bombers—some 40 percent of our aircraft—can be launched with less than 15 minutes warning. Once launched, the probability that the B-52 can penetrate current enemy defenses is estimated at more than [deleted] percent, and that of the B-58 at more than [deleted] percent.

As for missile forces, it is doubtful if an attack by the entire Soviet ICBM force today could destroy as many as [deleted] of our 1,000-missile MINUTEMAN force. [Deleted.] Also, for a successful first strike, the Soviets would have to destroy enough of both our land-based missile sites and our missile submarines so that our remaining missiles could be intercepted by their ABM system, and that ignores our bomber force.

At the present time U.S. forces have a capability to eliminate about [deleted] percent of the Soviet population, essentially the entire urban population, by blast and thermal effects alone, after absorbing a Soviet first-strike. In such a scenario, Soviet casualties probably would exceed U.S. casualties, and the United States would retain an advantage in residual strategic weapons. For the next 10 years, currently programed U.S. forces, together with additional deployments and modifications we can still elect to make, insure that we can continue to maintain deterrence in the face of possible Soviet deployments. New U.S. developments can help us to accomplish the same tasks against stronger threats at less cost than present systems, and with greater assurance.

Our extensive development efforts provide the basis for a continuing high level of U.S. missile effectiveness. If Soviet strategic capabilities continue to increase, we will have to implement additional major improvements in U.S. forces. For example, consider the following possible greater-than-expected (GTE) Soviet threat in fiscal year 1976:

[Deleted.]

If this Soviet threat should develop and we did not in the next 10 years add to the presently programed U.S. forces, our residual forces probably could inflict only some [deleted] percent prompt fatalities (blast and thermal effects) on the Soviet population, while U.S. losses would be considerably higher.

[Deleted.] And let us now, therefore, look at how we would cope with such a threat.

To improve missile survivability, the Air Force is developing a [deleted] silo with [deleted] the hardness of the presently deployed [deleted] silos. It would take [deleted] to achieve the same likelihood of destroying the new silo that [deleted] would achieve against our present silos with that accuracy. This same new silo will be able to accommodate either MINUTEMAN III as early as [deleted] or a larger advanced missile [deleted]. The addition of [deleted] MINUTEMAN III in [deleted] silos would provide enough additional surviving reentry vehicles to raise Soviet prompt fatalities to about [deleted] percent from the [deleted] percent I mentioned against the GTE threat in fiscal year [deleted]. Together with other U.S. force improvements that I will discuss later, this would maintain deterrence in the face of such a large Soviet force.

[Deleted.]

Let me turn now to our bomber forces on page 19.

If Soviet bomber defenses continue to increase and additional penetration aids become necessary, we will have to increase the payload of our programed bomber force. Otherwise we will find ourselves carrying many penetration aids and comparatively few weapons.

There is general agreement in the Department of Defense that an advanced bomber probably will be needed at some time in the future. Judgments on the timing depend on judgments as to how fast and how far the Soviet threat is likely to evolve.

By threat here we are principally talking about Soviet defenses against bombers.

I judge that the smallest advanced bomber that should be considered would be about [deleted] gross weight depending on whether it is subsonic or supersonic. I will discuss later why I think supersonic is the way to go. Its low altitude, unrefueled range would be greater than the B-52—by that I mean the B-52G and H, which are the long-range version of the B-52—and its weapon bay alone would house [deleted] SRAM, as compared with a maximum of [deleted] for the B-52 and [deleted] for the FB-111. Its [deleted] load of avionics and electronic countermeasures would compare favorably with the [deleted] carried by the FB-111. Its radar cross section, vitally important to penetration of advanced defense systems, would be lower than that of the B-52 [deleted].

Analyses indicate that against Soviet forces estimated for fiscal year 1976—this is the national intelligence estimate [deleted], our missile force alone would insure adequate deterrence—over 40 percent

Soviet fatalities. [Deleted.] Even if that insurance factor meant little to us, we would still want to maintain a bomber force to prevent the Soviets from shifting a major part of their air defense funds to missile defense. However, we would want to have a more efficient bomber force.

Against the expected threat in fiscal year 1976, we could greatly increase the bomber insurance factor at about a 15 percent increase in program cost [deleted]. However, if the Soviet threat continues over a long enough period—from now to a point 9 years after introduction of a new bomber on our part—that is until 1985—an advanced bomber force, equipped with advanced penetration aids, would be more cost-effective, as seen from the following table. (The table referred to is classified.) More cost effective, that is, than the program plus these advanced penetration aids. Of course, there is an element of uncertainty in both the exact nature of Soviet defenses and the degree of increased survivability that could be achieved with an advanced bomber.

Cost for enduring survival, that is, dispersal facilities for the alert force and postlaunch recovery, have been included in every case in this table. [Deleted.] The advanced bomber remains the most cost-effective bomber option whether or not enduring survival is included if this lever of Soviet threat actually appears and is maintained or exceeded through 1985. That is, if that level of Soviet threat appears, and if we decide that we want to maintain the approved bomber force, then we can retain a high Soviet fatality, as a result of our bombers, more cost-effectively from an improved—from an advanced bomber. And that is what this table shows.

If we take as the measure of capability against the high NIPP, so-called, high side of the national intelligence estimate, which is now estimated for the Soviets for fiscal year 1976, the number of SRAM's delivered through air defenses, that is the first numerical column, and equate it to a certain number of Soviet fatalities from the bomber attack alone, that is the next numerical column, then the cost of the various bomber systems shown on the left-hand side of the column is given on the right-hand column. And we show here three separate choices.

First is the approved bomber force with SRAM's and advanced penetration aids. That is higher than the approved force, and more costly. The approved force does not have SRAM's on all the bombers, nor does it have advanced penetration aids. That force, as I indicated, [deleted] and so if we wanted to keep our bombers up, we would at least, I believe, add these factors to the approved bomber force.

With that increase, which gives cumulative program costs of [deleted] SRAM's would be delivered through the area defenses and that would produce either [deleted] percent fatalities with the bombers alone, [deleted].

The next line gives an equivalent effectiveness advanced bomber force, also including advanced penetration aids. As you see, it costs less money. [Deleted.] Alternatively, in the third line, we have an advanced bomber force of equivalent cost to the approved bomber force, plus the advanced penetration aids and SRAM's, and that gives about double the effectiveness—[deleted] SRAM's delivered through area defenses.

I want to caution, as the footnote points out, that this is not actually the advanced bomber that we would recommend if we went ahead with an advanced bomber. This leaves out the advanced avionics and supersonic capability, which I think should be included, but whose justification really cannot be shown on such a table. It has to do with non-nuclear capability, and it has to do with flexibility in tactics—both of which have advanced by adding supersonic capability and advanced avionics to the bomber.

So much for that table, which deals with the high end of the national intelligence estimate.

If, however, the Soviet went to the greater-than-expected threat, then our programed forces with an advanced bomber would be more effective than with equal cost programed bombers, as is shown in the next two lines of the chart.

As you go to a higher Soviet threat what you find is that the advanced bomber looks more attractive, relatively, and for the same cost, it gives [deleted] percent as against [deleted] percent Soviet fatalities, or when combined with a missile's alone capability of [deleted] percent, you get [deleted] as opposed to [deleted] percent Soviet fatalities. Actually, of course, we would not be willing to let our missiles alone capability go down to [deleted] percent. We would make changes in our missile force to bring up that number.

The next pair of lines on the table show that combining a new advanced bomber and increasing the missile force would cost less than the program bomber force with penetration aids and a pure missile add-on. [Deleted.] Here is one case where new bombers are more cost effective than a larger number of missiles. But it is only one case. I am sure there are other cases where the opposite would be true.

The issue of supersonic speed and advanced avionics for the advanced bomber I have covered briefly. Again I want to reiterate I think these additional capabilities would be worth the additional cost in the long run.

To realize the advantages of an advanced bomber, we must reduce development leadtime; this depends on a decision to proceed with contract definition. The latter decision should be based on how one makes the following judgments:

1. The probability that the Soviets will continue to improve their overall strategic forces, making it preferable, or even necessary, for the United States to insure deterrence by maintaining both a missile force and a bomber force.

2. The probability that the Soviets will achieve an air defense capability—both interceptors and surface-to-air missiles—against low-level attacks that will require extensive upgrading, in the form of penetration aids, necessary to be added to our present bomber force.

3. The likelihood that we will find it useful or necessary to use strategic bombers in a conventional war in the 1970's or 1980's against areas as we are using them now in Vietnam, with defenses similar to SA-2's, SA-3's, AAA, and MIG-21's, greater in numbers but comparable in density to those in North Vietnam.

In my own view, there is little chance that the Soviets will slow down their strategic buildup enough to make U.S. bomber forces unnecessary. I also believe there is a real danger that the Soviets will

deploy a threat on the order of the greater-than-expected threat during the next 10 years, and I believe a high probability—[deleted] that they will obtain a low-altitude air defense with an airborne warning and control system, an interceptor with a look-down, shoot-down capability—such as we are proposing for our own defensive forces—and a surface-to-air missile with a capability between that of HAWK and SAM-D. There is also a possibility that we will need to use heavy bombers in a conventional war, against areas heavily defended enough to levy [deleted] percent attrition on B-52's.

It would take at least 8 years to acquire the first operational units of an advanced bomber if the decision to proceed were made in fiscal year 1969. The concept formulation phase has been completed. Numerous aircraft design studies and advanced development programs in propulsion and avionics provide high confidence in the technical feasibility of the aircraft. Without a start on full-scale development, hitherto represented by contract definition, additional expenditures will not reduce leadtime significantly—although, as I indicate on the next page, we are now looking for ways to reduce the development leadtime to 4 to 6 years without making a full commitment to production as well as development.

I would like to turn now on page 30 to strategic defense modernization.

I would like to start with the observation, already made by you, Mr. Chairman, that since a highly effective defense of cities against missiles is not in my opinion technologically feasible, it would not be reasonable to put disproportionately large resources into defending our cities against Soviet bombers. However, for reasons I will outline, a moderate level of air defense is necessary to help deter an enemy attack and to limit damage if an attack occurs.

Air defenses play a critical role in complicating the enemy's attack problem and in limiting the ultimate level of damage to the United States. Unopposed enemy aircraft could make multiple attacks and deliver warheads against hardened targets much more accurately than could missiles. If U.S. air defenses were very weak, the Soviets might attempt to use their missiles to disrupt the launch of our retaliatory forces until their bombers could arrive and eliminate most of our remaining weapons. Alternatively, they might feel free to use all their missiles in the destruction of our hardened missile silos, counting on their bomber force to destroy our cities. We must therefore have air defenses that are adequate to insure that large numbers of enemy aircraft cannot operate freely against U.S. targets. In other words, to insure that they do not have a free ride, as we call it, with their bombers.

In the absence of U.S. air defenses, Soviet bombers could attack at high altitudes carrying up to [deleted] bombs each rather than a smaller number of less effective, because less accurate air-to-surface missiles. Also the high approach profile would require less fuel, permitting use of additional medium bombers. Under these circumstances, [deleted] Soviet bombers might arrive over the United States, destroying as many as [deleted] MINUTEMAN silos. A reasonable level of U.S. air defense, based on modified F-106 aircraft, would force a low-level attack with fewer aircraft and less effective weapons, reducing the potential number of U.S. missile silos destroyed to something less than

[deleted]. So that air defense does contribute to the survival of our strategic forces in a very real way.

Our air defense also must be adequate to counter non-Soviet threats (such as Cuba or China), and to prevent unauthorized overflights of the United States from whatever source.

Our current air defenses were designed in the 1950's. Today the ground based elements of this system are highly vulnerable to an enemy attack, particularly to an enemy missile attack.

In addition, owing to line-of-sight limitations, none of our existing radars has a good low-altitude capability, and none of our airborne interceptor radars has a look-down capability. We can, however, correct these deficiencies, and produce a more effective air defense force with a smaller number of interceptors and at a lower 10-year cost than would be involved in the continuation of the present air defense force for 10 years. I want to make the point, Mr. Chairman, that our present air defense forces have substantial capability against a high-altitude attack by bombers, which is what they were designed against 10 years ago. But Soviet tactics we believe have evolved and still more will evolve in the same direction that have our own tactics evolved. We can penetrate the Soviet air defenses because we plan to go in at low altitude. We think that they are going to gain that capability, and therefore will make our air defenses much less capable, unless we do something about it. And what we propose to do is the following.

We are developing an airborne warning and control system (AWACS) which should be fully deployed by [deleted]. We would also like to modify our F-106 interceptors to give them a "look-down, shoot-down" capability against low-flying aircraft, which they do not now have. These modifications of the F-106 should be complete by [deleted]. The present Defense Department plans submitted to Congress call for [deleted] AWACS aircraft to provide surveillance, warning, and control for a force of [deleted] F-106X's. The AWACS will tie in with [deleted], over-the-horizon radars [deleted], to provide early warning.

We considered several alternatives for the interceptor force: the F-4X—which is a substantial modification of the F-4 aircraft, the F-106X, which is a kind of modification of the F-106, the F-12, which is a mach 3 interceptor, and a stretched out, that is, lengthened version, of the F-111. The F-4X and F-111 both proved less effective than the F-106X or F-12 at equal levels of expenditure. The choice between the F-106X and the F-12 depends on estimates of the future quantity and quality of the Soviet bomber threat—specifically, whether or not the Soviets deploy a supersonic bomber or develop a [deleted] NM ASM for their current force.

The Air Force has analyzed the probable effectiveness in 1970—there are uncertainties in these analyses, because that is a forecast—of [deleted] AWACS in conjunction with the F-106X force, a mixed F-106/F-12 force, and forces of [deleted] or [deleted] F-12's. The results are summarized in the following table.

As you see on the left-hand side we look at the various threats. [Deleted.] And the last line gives the program cost over a period of 10 years for each of four different options of force. The F-106X force including the AWACS and all the rest of the air defense forces

that go with it has a \$12.1 billion 10-year cost. [Deleted] F-12's have about \$1.6 billion more cost. A mixed force of F-106X and F-12's have about \$900 million more cost than the F-106. And [deleted] F-12's would cost about \$14.3 billion, \$2.2 billion more than the F-106X costs.

Now as you look at these numbers you can see that each of the alternative air defense forces considered above would serve to complicate the Soviet attack problem. [Deleted.]

If it were judged desirable to reduce the number of Soviet penetrations below that expected with the F-106X defense, while at the same time improving our capability against a possible supersonic bomber or long-range ASM threat, the better course of action would be to add some [deleted] F-12's to the F-106X force.

As you see, that third column in the table gives far lower numbers—that is to say, far fewer Soviet bombers penetrating, but at a cost of a billion dollars more than the basic force.

General McConnell and I are aware of the recent actions of the SASC relative to the matter of air defense and your interests in going into greater detail with regard to improving our interceptor force. The Air Force is also vitally concerned, and we realize that this matter is certainly a part of these strategic hearings. It is not, however, the main point of focus of these hearings. We are anxious to provide more information on this question and would be happy to do so at an early date either in the form of a comprehensive briefing we have prepared or through additional hearings.

Let me pause a moment to go more specifically into this matter of why the Air Force selected the F-106 airframe, with new avionics, as the bulk of the interceptors which we think we need in an improved air defense system—though we think that adding a small number of F-12's to the F-106X force would make a more effective force, and one less sensitive to improvements in the Soviet bomber force—although it would cost about a billion dollars more.

As is obvious from the data I have briefly sketched for you this morning, the Air Force has done a great deal of analysis work during the past year. It shows that our present interceptor force, because it lacks a look-down shoot-down capability, can exact only a very small attrition from a bomber attack on CONUS. We looked at every plausible interceptor airframe into which to put such a fire control and missile system. We concluded that the F-106X is the most effective aircraft against the expected Soviet threat. We need it very badly to modernize our air defense and to work with the new AWACS.

Let me be very clear on this point—the F-106 is not an obsolete aircraft. It was designed and optimized as a Mach II interceptor. It is air refuelable. It, like the F-12 and unlike the F-4, has a large weapons bay for internal carriage of air-to-air missiles. It has a data link and integrated displays designed for the air defense task and providing some autonomous capability independent of GCI or AWACS. It represents the same technology as the F-4 which we are buying today for tactical air operations. The average time per airplane in the force is [deleted]. The aircraft has a delta wing, which is basically very strong, and does not have the fatigue problems of long, flexing wings that must also carry heavy munitions stores. With addition of the new radar and improvements to the fire control system, we will have a most satisfactory solution to our interceptor needs.

As I said earlier, we would want to add F-12's to the force—and should consider a new Army SAM-D air defense missile as a replacement for NIKE-HERCULES—if Soviet long-range air-to-surface missiles, or supersonic bombers became part of the threat. Even against the present threat, a small number of F-12's greatly augment the capability of an F-106X or modified F-4 force. But against a threat of hundreds of bombers, ASM's, and decoys, we need a large number of interceptors. And the F-12 unit cost is so high that a pure F-12 force, in the \$12- or \$13-billion range of 10-year costs, would be too small in numbers.

If necessary, a small F-12 force of perhaps [deleted] interceptors could be deployed as early as [deleted]. These aircraft would have a 10-year system cost of about \$1 billion. If we did this by converting existing airframes, we could save some [deleted] million over procurement of new F-12's.

In the case of still greater improvements in the quality and quantity of the Soviet bomber force, we could further increase the number of F-12's.

That, Mr. Chairman, concludes my statement.
(The full statement follows:)

STATEMENT BY HON. HAROLD BROWN, SECRETARY OF THE AIR FORCE

BIOGRAPHY

Dr. Harold Brown, Secretary of the Air Force since October 1, 1965 (416 Argyle Dr., Alexandria, Va.). Born in New York on September 19, 1927; Columbia University, B.A., 1945, M.A., 1946, Ph.D (physics), 1949. Columbia University Medal of Excellence, 1963; Honorary Doctor of Engineering, Stevens Institute of Technology, 1964; Honorary Doctor of Laws, Long Island University, 1966, and Gettysburg College, 1967.

Lecturer in Physics and a member of the Scientific Staff of Columbia, 1947-50. Lydig Fellowship, 1948-1949; lecturer in physics at Stevens Institute of Technology, 1949-50. Post-doctoral research at Columbia, 1950. Research Scientist, University of California Radiation Laboratory at Berkeley, 1950-52. Staff member, Livermore Site of the Radiation Laboratory, 1952; Group Leader, 1953; Division Leader, 1955; Associate Director, 1958; Deputy Director, 1959; Director of the Lawrence Laboratory at Livermore, 1960.

Advisor to the U.S. Delegation to the Conference of Experts on the Detection of Nuclear Weapons Tests in Geneva, summer of 1958; and Senior Scientific Advisor to the U.S. Delegation to the Conference on Discontinuance of Nuclear Weapons Tests, November 1958 to February 1959. Member of the Polaris Steering Committee, 1956-58. Consultant to the Air Force Scientific Advisory Board, 1956-57; member of the SAB, 1958 to 1961; also member of the Scientific Advisory Committee on Ballistic Missiles to the Secretary of Defense, 1958-61; consultant to several panels of the President's Science Advisory Committee, 1958-1960; and member of the President's Science Advisory Committee, 1961. Navy Distinguished Public Service Award, 1961; Director of Defense Research and Engineering, May 1961 to October 1965.

Member of the American Physical Society; Sigma Xi and Phi Beta Kappa. Married the former Colene D. McDowell of San Francisco; two children.

STATEMENT

Mr. Chairman, members of the subcommittee, Secretary McNamara, General McConnell, and I have described Air Force programs in detail in the FY 69 authorization hearings. I now would like to discuss more fully several of the difficult points of judgment involved in strategic force decisions.

First, I will outline my views on the complex nature of deterrence and its relationship to our war-fighting capabilities. Second, I will cover a number of critical uncertainties in estimating future enemy capabilities. Third, I will discuss the measures we are taking to insure that we can maintain deterrence whatever the

Soviet Union does in the way of development and deployment. And fourth, I will review major weapons programs, covering the critical issues and decision points in each of the following areas: advanced missile forces, advanced bomber forces, and air defense modernization.

Let me state my principal judgments at the outset. The Soviet strategic threat is indeed serious and shows no sign of melting away. Present and future Soviet capabilities are such that any all-out thermonuclear war would inflict unacceptable damage on both the U.S. and the U.S.S.R. And if the Soviets exercise good planning, nothing we can do in the foreseeable future will reduce our own expected damage to an acceptable level. However, the wide range of developments which we have underway is well designed to insure that we can continue to deter a nuclear attack against us whatever route the Soviets—or the Communist Chinese—elect to take. In particular, these actions will allow us to maintain a more secure and effective strategic capability against the Soviets than they could use against us, and an effective damage limiting capability against the Communist Chinese into the 1980s. We must modernize our bomber defenses in the face of a continuing Soviet bomber threat. And if Soviet forces continue to increase, I believe we will wish to undertake full-scale development of an advanced bomber, and to update our land-based missile force.

I. The basis of deterrence

If a strategic war occurs, it is not likely to be the spasm war which we have read so much about. Both sides now have enough well protected strategic forces to eliminate the need for a hair trigger launch of all weapons. The success or failure of deterrence is likely to be determined by hard calculations in the minds of enemy leaders. Deterrence depends on what they think a strategic war would be like.

Hopefully, the Soviets have achieved a degree of prosperity that they would not want to give up through a strategic war. But we must assume a coldly realistic Soviet government that might be faced with severe political and economic problems. And we must remember that, historically, Russian governments have been willing to sacrifice large numbers of their own people in order to attain priority objectives. They may grossly overestimate their ability to eliminate U.S. weapons, and they may be willing to accept heavy population loss and industrial damage if they believe they have a moderate chance of achieving complete dominance in the end.

To insure deterrence, we must be able to inflict an unacceptable level of damage on the Soviets after we have absorbed a Soviet first-strike. Exactly what that level is will depend on the judgments of enemy leaders about the outcome of actual war. Mr. McNamara, in his recent posture testimony, stated that the question could not be answered precisely, but judged that a capability to destroy 20-25% of the Soviet population and 50% of her industry should serve as an effective deterrent.

Of course, even 25% Soviet casualties might not be enough for deterrence if U.S. casualties were disproportionately higher—if the Soviets thought they would be able to recover in some period of time while the U.S. would take three or four times as long, or would never recover, then the Soviets might not be deterred.

Consequently, in addition to the basic deterrent capability to eliminate some fraction, such as 25% of the Soviet population in retaliation, our measurement of deterrence should include two other criteria, less central but still important: (1) ratios of surviving population and industry must not be badly adverse to the United States, and (2) the surviving military balance should remain in our favor. U.S. forces that can guarantee these results should be sufficient to deter attack and inhibit nuclear blackmail even in crisis situations. And if deterrence should fail, a favorable surviving military balance could make it easier for us to negotiate an end to the war and limit further damage to the United States.

Having said all that, I want to reiterate that an all-out thermonuclear war would be so catastrophic for both sides that its threats cannot be used with any confidence to deter actions less than the massive use of nuclear weapons on the U.S. or its NATO allies.

II. Uncertainties associated with future enemy capabilities

There is no shortage of examples which illustrate the difficulty of judging enemy capabilities and probable tactics, to say nothing of enemy intentions. The Soviet fractional orbit bombardment system (FOBS) is an example of the appearance of a new weapon system. In this instance we were not caught short

since we earlier had the foresight to develop an over-the-horizon radar warning system. Perhaps the biggest reason the Soviet development of FOBS was unexpected was because some years ago it seemed to us a poor choice for a strategic system. It still does.

We can illustrate the intelligence problem of detecting an increase in the strategic threat by looking at our own strategic programs from the Soviet point of view. In FY 70 and 71 the U.S. missile force will remain level at 1,710 and our bomber force will decline from 540 to 465—facts that we have made clear to the Soviet planner, and which he can verify. What he has no way of verifying is that our total number of warheads, because of MIRV, will increase by over [deleted]. Nevertheless, I certainly do not ignore the possibility of a Soviet threat considerably greater than the high side of current estimates. That is why we use a greater-than-expected threat (GTE) as one measure for evaluating our forces.

The Soviets have gone ahead with major improvements in their strategic forces. While they may be seeking only to improve the invulnerability of their deterrent, it is also possible that they are trying to attain a first-strike capability aimed at overcoming the U.S. deterrent. They may expect that their improved submarine-based missile force and their FOBS will catch U.S. bombers on the ground. They may plan to deploy a missile force or mount a precise bomber attack to destroy our missile silos. Their new attack submarines, surface forces and naval air units, while at present estimated to have only a modest anti-submarine warfare capability, may be aimed by [deleted] at neutralizing our Polaris submarines. Finally, they may hope that their ABM system and improved air defenses can eliminate most of the remaining U.S. weapons as we retaliate.

If, however, they have been contemplating the serious possibility of an effective first-strike capability, they are probably now becoming aware that they cannot succeed. For it lies within our power to deny them such a capability, and our own force developments have been designed to accomplish this. Our forwardscatter over-the-horizon radars will cancel out the chief advantage of FOBS—its potential for surprise attack against our bomber bases. Our rapid development of multiple warheads and terminal penetration aids counters their ABM system. Further, our planned development of hard-[deleted] silos for our missiles should give the Soviets little hope of threatening our missile force with destruction before launch, even if they increase the payload and accuracy of their own missiles. We also have the option of deploying our own ABM defenses to protect our missile sites if that should become necessary.

III. Insurance against new threats

It is most unlikely that the U.S.S.R. could bring a new weapon system to operational status without our knowing about it. For example, if the Soviets decided to [deleted] they would need [deleted] of development time before getting an initial operational capability. We could probably detect [deleted] before they could carry out a major deployment, and could then make adjustments in our own forces. These adjustments need not always take the form of new weapons. We also can increase our own numbers of proven weapons, or we can take advantage of available options to increase their capability.

The U.S. maintains both a bomber force and a missile force—either of which alone could at the present time guarantee adequate deterrence. Therefore, each provides insurance against degradation of the other as a result of unexpected Soviet developments. The chance that the Soviets could eliminate either our bombers or our missiles is negligible at present. Our alert bombers—some 40% of our aircraft—can be launched with less than 15 minutes warning. Once launched, the probability that the B-52 can penetrate current enemy defenses is estimated at more than [deleted] and that of the B-58 at more than [deleted].

As for missile forces, it is doubtful if an attack by the entire Soviet ICMB force today could destroy as many as [deleted] of our 1,000 missile MINUTEMAN force. [Deleted.] Also, for a successful first-strike, the Soviets would have to destroy enough of both our land-based missile sites and our missile submarines so that our remaining missiles could be intercepted by their ABM system.

At the present time U.S. forces have a capability to eliminate [deleted] of the Soviet population, essentially the entire urban population, by blast and thermal effects alone, after absorbing a Soviet first-strike. In such a scenario, Soviet casualties probably would exceed U.S. casualties, and the U.S. would retain an

advantage in residual strategic weapons. For the next 10 years, currently programmed U.S. forces, together with additional deployments and modifications we can still elect to make, insure that we can continue to maintain deterrence in the face of possible Soviet deployments. New U.S. developments can help us to accomplish the same tasks against stronger threats at less cost than present systems and with greater assurance. They will permit us to achieve the major improvements in capability that will be necessary to maintain deterrence beyond 10 years, and will allow us as a bonus the ability to preserve war-fighting capabilities beyond pure deterrence. But since their principal justification is an anticipated increase in Soviet capability, the timing of our actions is the central question.

In planning future forces, we try to investigate as many new ideas as possible. We use massive research and development to insure our world leadership in technology. This gives us a high probability of being the first to discover any major new concepts in strategic weapons. It also insures that we can quickly offset any particular advances that the Soviets may make. Our research efforts contribute to development projects which in turn provide the basis for a wide range of possible operational systems.

In determining the resources to be assigned to development options we move ahead with speed appropriate to (1) the system's promise of effectiveness, (2) related enemy force improvements, and (3) our best estimate of the added insurance which the particular development will provide for our deterrent capability. Of course, each of our estimates and calculations regarding future capabilities is subject to some degree of uncertainty. I offer the analyses that follow as our best judgments.

IV. U.S. advanced missile forces

Our extensive development efforts provide the basis for a continuing high level of U.S. missile effectiveness. If Soviet strategic capabilities continue to increase, we will have to implement additional major improvements in U.S. forces. For example, consider the following possible greater-than-expected (GTE) Soviet threat in FY 1976:

[Deleted.]

If this Soviet threat should develop and we did not in the next 10 years add to the presently programmed U.S. forces, our residual forces probably could inflict only some [deleted] prompt fatalities (blast and thermal effects) on the Soviet population, while U.S. losses would be considerably higher.

To improve missile survivability, the Air Force is developing a [deleted] silos with [deleted] the hardness of the presently deployed [deleted] silos. It would take [deleted] to achieve the same likelihood of destroying the new silo that [deleted] would achieve against our present silos with that accuracy. This same new silo will be able to accommodate either MINUTEMAN III as early as [deleted] or a larger advanced missile [deleted]. The addition of [deleted] MINUTEMAN III in [deleted] silos would provide enough additional surviving reentry vehicles to raise Soviet prompt fatalities to about [deleted] from the [deleted] I mentioned against the GTE threat in [deleted]. (Together with other U.S. force improvements that I will discuss later, this would maintain deterrence in the face of such a large Soviet force.)

As the Soviets improve their ABM system, we must increase our missile penetration capability. This can be accomplished by increasing the number of warheads and by using advanced penetration devices. General Ferguson will discuss MIRVs and penetration aids in detail.

For the [deleted] we are considering the use of a large, advanced ICBM as a means of delivering additional penetration aids and warheads against a dense ABM system. This missile, [deleted] would send a [deleted] payload a distance of [deleted]. By comparison, the MINUTEMAN III is programmed to carry approximately [deleted] for [deleted].

The choice between [deleted] and additional MINUTEMAN III will depend on the total additional throw weight needed—which in turn depends on the level of Soviet ABM deployment—and the mean range to new Soviet targets. The relationship between range and cost can be seen from the following table: (The table referred to is classified.)

Thus, if [deleted] pounds of additional throw weight are necessary, the [deleted] would be less costly than additional MINUTEMAN III. Moreover, the [deleted] would have other performance advantages [deleted] hardened guidance components, improved accuracy, and more [deleted]—all of which

would be useful against Soviet defenses and would be difficult to include in MINUTEMAN III. [Deleted.]

The combination of the [deleted] silo [deleted] and the large payload [deleted] missile, would give us great flexibility to deal with changes in the Soviet threat. [Deleted.] Meanwhile, in view of the present rate of deployment of Soviet ABM defenses, MINUTEMAN III in new silos [deleted] would provide the most effective way to maintain the near-term capability of our land-based missile force if a threat develops which must be met in the [deleted].

V. Advanced bomber forces

A mixed force of bombers and missiles serves several functions in deterring and fighting a strategic war: to minimize the cost of our deterrent in the face of a well-planned Soviet offensive and defensive threat, to insure that the Soviets cannot hope for any relative advantage in a protracted but limited strategic exchange, and to insure against unexpected Soviet developments or tactics that might reduce the deterrent or war-fighting value of either our bombers or missiles alone. In designing improved bomber forces we must consider measures to provide survival in the face of a surprise attack, and to insure penetration of improved enemy defenses.

Measures to provide survival in case of surprise attack must include new warning systems and dispersal of bombers. Mr. McNamara, Dr. Foster, and I have described new warning systems in our posture statements—and General Ferguson will give you additional information on new developments. Our over-the-horizon radars [deleted] will continue to provide sufficient warning in spite of the new Soviet FOBS and improved Soviet submarine-launched missiles. However, the warning time for these new Soviet weapons probably will be less than that which we can now achieve for the Soviet ICBM.

To maintain survivability with reduced warning time we will have to further disperse our bomber forces. This will probably require additional air base facilities for our present bombers and design features for new bombers that will permit efficient maintenance at remote sites, as well as operations from medium length runways. The FB-111 will represent a considerable improvement over the B-52 in each of the latter respects.

[Deleted.]

If Soviet bomber defenses continue to increase and additional penetration aids become necessary, we will have to increase the payload of our programmed bomber force. Otherwise we will find ourselves carrying many penetration aids and comparatively few weapons.

There is general agreement in the Department of Defense that an advanced bomber probably will be needed at some time in the future. Judgments on the timing depend on judgments as to how fast and how far the Soviet threat is likely to evolve.

I judge that the smallest advanced bomber that should be considered would be about [deleted] gross weight depending on whether it is subsonic or supersonic. I will discuss later why I think supersonic is the way to go. Its low altitude, unrefueled range would be greater than the B-52, and its weapon bay alone would house [deleted] SRAM, as compared with a maximum of [deleted] for the B-52 and [deleted] for the FB-111. Its [deleted] load of avionics and electronic countermeasures would compare favorably with the [deleted] carried by the FB-111. Its radar cross section, vitally important to penetration of advanced defense systems, would be lower than that of the B-52 [deleted].

Analyses indicate that against Soviet forces estimated for FY 76 [deleted] our missile force alone would insure adequate deterrence—over [deleted] Soviet fatalities. [Deleted.] Even if that insurance factor meant little to us, we would still want to maintain a bomber force to prevent the Soviets from shifting a major part of their air defense funds to missile defense. However, we would want to have a more efficient bomber force, and there are several ways to obtain such a force.

Against the expected threat in FY 76, we could greatly increase the bomber insurance factor at about a 15% increase in program cost [deleted]. However, if the Soviet threat continues over a long enough period—from now to a point nine years after introduction of a new bomber—an advanced bomber force, equipped with advanced penetration aids, would be more cost-effective, as seen from the following table [deleted]. Of course there is an element of uncertainty in both the exact nature of Soviet defenses and the degree of increased survivability that could be achieved with an advanced bomber.

Cost for enduring survival, that is, dispersal facilities for the alert force and post-launch recovery, have been included in every case in this table. [Deleted.] The advanced bomber remains the most cost-effective bomber option whether or not enduring survival is included if this level of Soviet threat actually appears and is maintained or exceeded through 1985.

[Deleted.]

If the Soviet greater-than-expected threat that I outlined earlier should develop, our programmed forces with an advanced bomber would be more effective than with equal cost programmed bombers: [Deleted.] In addition, the combination of new advanced bombers and an increased missile force would cost less than the programmed bomber force with penetration aids and a pure missile add-on for equal effectiveness (if enduring survival for all bomber forces is a requirement as I think it should be):

There remains the issue of supersonic speed and advanced avionics for the advanced bomber. I believe that these additional capabilities would be worth the additional cost in the long run. The ability to achieve supersonic speed would permit more flexible tactics against improved air defenses. [Deleted.] Moreover, bombers have utility for missions other than city attacks, such as counter-military attack missions and particularly nonnuclear operations. An advanced bomber with these additional capabilities would be better able to locate and destroy difficult military targets in either a nuclear or nonnuclear war.

In a nonnuclear conflict in which surface-to-air missiles are equipped with nonnuclear warheads, supersonic high-altitude penetration would offer substantial advantages. As evidenced in Vietnam, highly concentrated defenses raise the attrition for low altitude penetration. High-altitude, subsonic bomber penetration would result in high attrition (for a nonnuclear war, 2% is high) from even unsophisticated interceptor aircraft. High-altitude penetration at supersonic speeds avoids the low level defenses and may in the 1980 period provide a better mode for coping with all but very high performance interceptors and surface-to-air missiles. The latter two systems can be significantly degraded by electronic countermeasures.

[Deleted.]

To realize the advantages of an advanced bomber, we must reduce development leadtime; this depends on a decision to proceed with contract definition. The latter decision should be based on how one makes the following judgments:

1. The probability that the Soviets will continue to improve their overall strategic forces, making it preferable, or even necessary, for the U.S. to insure deterrence by maintaining both a missile force and a bomber force.
2. The probability that the Soviets will achieve an air defense capability—both interceptors and surface-to-air missiles—against low-level attacks that will require extensive upgrading, in the form of penetration aids, necessary to be added to our present bomber force.
3. The likelihood that we will find it useful or necessary to use strategic bombers in a conventional war in the 1970s or 1980s as we are using them now in Vietnam, against areas with defenses similar to SA-2s, SA-3s, AAA, and MIG-21s, greater in numbers but comparable in density to those in North Vietnam.

In my own view, there is little chance that the Soviets will slow down their strategic build-up enough to make U.S. bomber forces unnecessary. I also believe there is a real danger that the Soviets will deploy a threat on the order of the greater-than-expected threat during the next 10 years, and I believe a high probability that they will obtain a low altitude air defense with an airborne warning and control system, an interceptor with a look-down, shoot-down capability, and a surface-to-air missile with a capability between that of HAWK and SAM-D. There is also a possibility that we will need to use heavy bombers in a conventional war, against areas heavily defended enough to levy [deleted] attrition on B-52s.

It would take at least eight years to acquire the first operational units of an advanced bomber if the decision to proceed were made in FY 69. The concept formulation phase has been completed. Numerous aircraft design studies and advanced development programs in propulsion and avionics provide high confidence in the technical feasibility of the aircraft. Without a start on full-scale development, hitherto represented by Contract Definition, additional expenditures will not reduce leadtime significantly.

Through FY 67 and 68, we expect to spend \$44.8 million on systems studies and on avionics and engine development. Some of the results of these efforts will be applicable to other advanced aircraft and to improvements in the present force.

Similarly, the advanced bomber will ultimately benefit from present programs in areas such as improved penetration aids. The President's FY 69 authorization request contains \$30 million for an advanced bomber.

We are now looking for ways to reduce the development leadtime to four to six years without making a full commitment to production as well as development.

VI. Strategic defense modernization

As I mentioned in my discussion of deterrence, comparative war fighting capabilities, relative damage levels, and surviving military forces are important in preventing a strategic war. A potential aggressor will weigh his own losses against U.S. losses. To make his risk acceptable, he must deploy enough weapons to penetrate U.S. defenses and eliminate much of the U.S. retaliatory force before it can be launched. U.S. strategic defenses serve to complicate the enemy's attack problem and increase the total number of weapons he will need to eliminate U.S. weapons and destroy U.S. cities.

With regard to anti-ballistic missile defenses, I support a SENTINEL system deployment of the extent that has been approved—a thin system to counter the expected Chinese threat in the mid-70s. But a large-scale ABM system would not be a good idea in the light of current technology. The Soviets could penetrate our defense at substantially lower cost than we could build it. And since only a few Soviet missiles would have to get through to destroy our cities, we could not expect to achieve any real protection for our population.

It is true, however, that ABM defenses would make an attack on our retaliatory forces more difficult. At some time I think it may be desirable to deploy point defense for our land-based ballistic missile force—but I do not think we have reached that time yet. The [deleted] silo will be as or more effective an option, given expected Soviet missile accuracy and the present state of ABM technology. In a sense, the [deleted] silo is a form of ABM defense.

Since a highly effective defense of cities against missiles is not in my opinion technologically feasible, it would not be reasonable to put disproportionately large resources into defending our cities against Soviet bombers. However, for reasons I will outline, a moderate level of air defense is necessary to help deter an enemy attack and to limit damage if an attack occurs.

Air defenses play a critical role in complicating the enemy's attack problem and in limiting the ultimate level of damage to the United States. Unopposed enemy aircraft could make multiple attacks and deliver warheads against hardened targets much more accurately than could missiles. If U.S. air defenses were very weak, the Soviets might attempt to use their missiles to disrupt the launch of our retaliatory forces until their bombers could arrive and eliminate most of our remaining weapons. Alternatively, they might feel free to use all their missiles in the destruction of our hardened missile silos, counting on their bomber force to destroy our cities. We must therefore have air defenses that are adequate to insure that large numbers of enemy aircraft cannot operate freely against U.S. targets.

In the absence of U.S. air defenses, Soviet bombers could attack at high altitudes carrying up to [deleted] bombs each rather than a smaller number of less effective because less accurate air-to-surface missiles. Also the high approach profile would require less fuel, permitting use of additional medium bombers. Under these circumstances, [deleted] Soviet bombers might arrive over the U.S., destroying as many as [deleted] MINUTEMAN silos. A reasonable level of U.S. air defense, based on modified F-106 aircraft, would force a low level attack with fewer aircraft and less effective weapons, reducing the potential number of U.S. missile silos destroyed to something less than [deleted].

Our air defense also must be adequate to counter non-Soviet threats (such as Cuba or China), and to prevent unauthorized overflights of the United States from whatever source.

Our current air defenses were designed in the 1950s. Today the ground based elements of this system are highly vulnerable to an enemy attack. In addition, owing to line-of-sight limitations, none of our existing radars has a good low altitude capability, and none of our airborne interceptor radars has a look-down capability. We can, however, correct these deficiencies, and produce a more effective air defense force with a smaller number of interceptors and at a lower 10-year cost than would be involved in the continuation of the present air defense force for 10 years. We are developing an airborne warning and control system (AWACS) which should be fully deployed by [deleted]. We would also like to modify our F-106 interceptors to give them a "look-down, shoot-down" capability against low-flying aircraft. These modifications of the F-106 should be

complete by [deleted]. Present plans call for [deleted] AWACS aircraft to provide surveillance, warning and control for a force of [deleted] F-106Xs. The AWACS will tie in with [deleted] over-the-horizon radars [deleted].

We considered several alternatives for the interceptor force: the F-4X, the F-106X, the F-12 and a "stretched out" version of the F-111. The F-4X and F-111 both proved less effective than the F-106X or F-12 at equal levels of expenditure. The choice between the F-106X and the F-12 depends on estimates of the future quantity and quality of the Soviet bomber threat—specifically, whether or not the Soviets deploy a supersonic bomber or develop a [deleted] NM ASM for their current force.

The Air Force has analyzed the probable effectiveness in 1970 of [deleted] AWACS in conjunction with the F-106X force, a mixed F-106/F-12 force, and forces of [deleted] or [deleted] F-12s. The results are summarized in the following table [deleted].

Each of the alternative air defense forces considered above would serve to complicate the Soviet attack problem. [Deleted.]

If it were judged desirable to reduce the number of Soviet penetrations below that expected with the F-106X defense, while at the same time improving our capability against a possible supersonic bomber or long range ASM threat, the better course of action would be to add some [deleted] F-12s to the F-106X force.

General McConnell and I are aware of the recent actions of the SASC relative to the matter of air defense and your interests in going into greater detail with regard to improving our interceptor force. The Air Force is also vitally concerned, and we realize that this matter is certainly a part of these strategic hearings. It is not, however, the main point of focus of these hearings. We are anxious to provide more information on this question and would be happy to do so at an early date either in the form of a comprehensive briefing we have prepared or through additional hearings.

Let me pause a moment to go more specifically into this matter of why the Air Force selected the F-106 airframe, with new avionics, as the bulk of the interceptors which we think we need in an improved air defense system—though we think that adding a small number of F-12s to the F-106X force would make a more effective force, and one less sensitive to improvements in the Soviet bomber force. As is obvious from the data I have briefly sketched for you this morning, the Air Force has done a great deal of analysis work during the past year. It shows that our present interceptor force, because it lacks a look-down, shoot-down capability, can exact only a very small attrition from a bomber attack on CONUS. We looked at every plausible interceptor airframe into which to put such a fire control and missile system. We concluded that the F-106X is the most effective aircraft against the expected Soviet threat. We need it very badly to modernize our air defense and to work with the new AWACS.

Let me be very clear on this point—the F-106 is not an obsolete aircraft. It was designed and optimized as a Mach 2 interceptor. It is air refuelable. It, like the F-12 and unlike the F-4, has a large weapons bay for internal carriage of air-to-air missiles. It has a data link and integrated displays designed for the air defense task and providing some autonomous capability independent of GCI or AWACS. It represents the same technology, as the F-4 which we are buying today for tactical air operations. The average time per airplane in the force is [deleted]. The aircraft has a delta wing, which is basically very strong, and does not have the fatigue problems of long flexing wings that must also carry heavy munitions stores. With addition of the new radar and improvements to the fire control system, we will have a most satisfactory solution to our interceptor needs.

As I said earlier, we would want to add F-12s to the force—and should consider a new Army SAM-D air defense missile as a replacement for NIKE HERCULES—if Soviet long range air-to-surface missiles, or supersonic bombers became part of the threat. Even against the present threat, a small number of F-12s greatly augment the capability of an F-106X or modified F-4 force. But against a threat of hundreds of bombers, ASMs, and decoys, we need a large number of interceptors. And the F-12 unit cost is so high that a pure F-12 force, in the 12 or 13 billion dollar range of 10 year costs, would be too small in numbers.

If necessary, a small F-12 force of perhaps [deleted] interceptors could be deployed as early as [deleted]. These aircraft would have a 10 year system cost of about \$1 billion.*

*If we did this by converting existing airframes, we could save some [deleted] over procurement of new F-12's.

In the case of still greater improvements in the quality and quantity of the Soviet bomber force, we could further increase the number of F-12s.

IN CONCLUSION

My view of our strategic forces is one of confidence tempered with caution. Certainly we could destroy any aggressor at the present time. Moreover, I am confident that our exploratory and advanced development programs and American productive capacity can offset any attempt by the Soviet Union to overcome our strategic forces in the future.

We should not discount the possibility of the Soviets temporarily being able to attrite significantly either our bombers or missiles, by destruction before launch, or by active defense. But if we continue to make wise development and deployment choices, such an enemy capability will be shortlived, and there will be practically no chance for him to degrade unacceptability *either* our bombers or our missiles, and no chance at all for him to degrade *both* simultaneously.

I continue to hope that in the long run we can reach a working agreement with the Soviets that will permit us to use our resources for more satisfying purposes than buying weapons. But Soviet actions do not yet warrant our letting this hope serve as a substitute for strength. I think the most likely way to prompt the Soviets to accept meaningful arms control is to insure that they can never achieve strategic dominance over the U.S. In this sense I believe we can say that so long as no such control is in sight, carefully thought out improvements in our strategic forces contribute to world stability and to peace.

Senator STENNIS. I think, gentlemen, and members of the committee, we have heard two remarkable statements. They certainly do carry a lot of impressive facts and weighty figures.

General Nazzaro, will you proceed with your statement?

STATEMENT BY GENERAL JOSEPH J. NAZZARO, COMMANDER IN CHIEF,
STRATEGIC AIR COMMAND

BIOGRAPHICAL SKETCH

General Joseph J. Nazzaro is Commander in Chief of the Strategic Air Command. SAC is the United States long-range strike force comprised of a mixture of combat aircraft and intercontinental ballistic missiles. General Nazzaro was born in New York, N.Y., March 21, 1913. He attended high school in New York; Millard Preparatory School in Washington, D.C.; graduated from the U.S. Military Academy in 1936, and was commissioned a Second Lieutenant in the Infantry. After graduation from advanced flying school, Kelly Field, Texas, in October 1937, he was transferred to the Air Corps.

His first assignment was in the Philippine Islands. From 1940 to 1942, General Nazzaro held assignments with the 7th Bombardment Group, Salt Lake City, Utah; 39th Bombardment Group, Geiger Field, Washington, and commanded the 302nd Bombardment Group, Tucson, Arizona. Early in 1943, General Nazzaro was named Commander of the 381st Bombardment Group, Pyote, Texas, and led the unit to England in May where it joined the Eighth Air Force. In January 1944, he became Deputy Director of Operations, United States Strategic Forces in Europe.

In August 1944, General Nazzaro returned to the United States and was assigned as Deputy Commander, 316th Bombardment Wing, Colorado Springs, Colorado. The wing moved to Okinawa December 1, 1945, at which time he assumed command. His next assignment came in May 1946, when he became Chief, Operations Division, Headquarters SAC, Bolling Field, Washington, D.C. Following graduation from the Air Command and Staff School, Maxwell AFB, Alabama, General Nazzaro became an instructor at the school, a position he held until December 1948. He then returned to Washington, D.C., for duty in the War Plans Division, Directorate of Plans, Headquarters U.S. Air Force.

In August 1952, General Nazzaro moved to Lake Charles AFB, Louisiana, to take command of the 68th Bombardment Wing. A year later he was named 38th Air Division Commander, Hunter AFB, Georgia. In June 1955, General Nazzaro was appointed Commander of SAC's 5th Air Division in Morocco, a

position he held until July 1957. On his return to the United States, he was assigned to U.S. Air Force Headquarters as Director of Personnel Planning. In July 1959, General Nazzaro was named Deputy Commander, Fifteenth Air Force, March AFB, California. He took command of the Eighth Air Force, Westover AFB, Mass., October 1, 1962. On December 1, 1964, General Nazzaro became Vice Commander in Chief of SAC.

General Nazzaro became Commander in Chief of SAC and was promoted to four-star rank February 1, 1967.

He is a command pilot, combat observer and aircraft observer. His decorations include the Distinguished Service Medal, Silver Star, Legion of Merit with three oak leaf clusters, Distinguished Flying Cross and the Air Medal with one oak leaf cluster.

STATEMENT

Mr. chairman, members of the subcommittee, it is a privilege to be here to discuss with you the posture and capabilities of the Strategic Air Command. My remarks will address the present and near term future of the command, as well as how we view the more distant prospects for the 70's.

The former Secretary of Defense has stated: "The foundation of our security is the deterrence of a Soviet nuclear attack." SAC is a major contributor to that deterrent capability by being responsive to the JCS strategy. General Wheeler, Chairman, JCS, expresses this strategy as being able "... To deter aggression at any level ... should deterrence fail, to terminate hostilities, in concert with our allies, under conditions of relative advantage while limiting damage to the U.S. and minimizing damage to the U.S. and allied interests."

In any discussion of deterrence it is important to clearly recognize that deterrence is a state of mind brought about by a credible threat of unacceptable counter-actions. The force posture required to create a credible deterrent cannot be calculated with a high degree of certainty. In order to provide a broad range of options to the national authority, I believe that our strategic forces must appear to the enemy to be capable of attacking and destroying his military forces as well as a large portion of his population and industrial base even after we have received an initial attack.

In my remarks I will comment on the threat, with particular emphasis on its implications to SAC. Then, after a brief summary of the status of the SAC forces, I will describe various courses of action that are available to SAC in maintaining its deterrent posture.

These actions, responding to changing enemy capabilities, fall into three general categories:

First—Those measures largely within the authority of CINCSAC; i.e., changing tactics or altering the posture of the command. These can be done immediately.

Second—Modifications or alterations to the basic weapon systems.

Third—New weapon systems. Their availability is expressed in years.

Threat

The strategic nuclear threat confronting our country has been described to you. Of particular concern is the heavy emphasis the USSR is placing on its strategic offensive and defensive effort.

In China, we see priority emphasis being given to the development of both nuclear weapons and a missile capability.

There are two features of current Soviet military effort that have greatest impact on SAC now and in the future.

First, the increase in Soviet strategic offensive forces, coupled with feasible technological developments, could lower the pre-launch survivability of elements of the SAC deterrent force. Secondly, Soviet defensive developments will make our penetration of those defenses more difficult.

Based on the present trend, by mid-1969 the Soviets will achieve numerical parity with the United States in ICBM launchers. Of special importance is the strong possibility that their missile force will continue to grow in the years that follow. [Deleted.]

One impressive feature of Soviet ICBMs is the large payload of [deleted]. The throw weight of this missile is important [deleted].

Another significant Soviet development is the Fractional Orbital Bombardment System, or FOBS. The Soviets may believe the FOBS could be a "first strike, surprise attack" weapon against SAC bomber bases.

Long Range Aviation is also a significant component of the Soviet intercontinental attack capability. This year we have seen an increase in heavy bomber

training activity in the Polar region, highlighted by several flights along the Alaska and Newfoundland coastlines. Although less is known about their Medium bomber force, we cannot ignore the fact that some of these aircraft could be used against the U.S.

An emerging near-term threat to SAC's deterrent posture is a new nuclear powered submarine [deleted].

We recognize that the Soviets are building defenses against ballistic missiles and continuing to improve their defenses against aircraft. There is an anti-ballistic missile system around Moscow which covers the U.S. missile threat into the immediate area. In view of the historical Soviet interest in development of a better strategic defense, they may deploy a more extensive ABM system involving both general area defense and terminal defense of key urban industrial areas.

We believe the Soviets fully recognize the need for a better defense against low-flying bombers [deleted].

In addition, a new high performance interceptor, the Foxbat, is expected to be operational in [deleted].

The Tallinn defensive missile system now being developed is credited with [deleted].

These aspects of the threat have the greatest impact on elements of SAC. In retrospect, certain of our past intelligence projections were underestimated and the number of missiles and bombers available to him today is greater than those forecast a few years ago. This contributes to the problem of planning our future force needs.

Now I'll discuss these SAC programs.

SAC program

As you know, the U.S. strategic offensive forces are comprised of U.S.-based ICBMs, SLBMs, and SAC bombers. My remarks are primarily focused on those elements that are assigned to the Strategic Air Command.

Today the SAC force consists of 620 bombers and 1054 missiles. We have completed the phaseout of some of the older B-52s. Although SAC has requested their retention, the entire B-52C through F force and the B-58s are scheduled to complete their phaseout by the end of FY 71 and 72. The B-58 phaseout schedule is being reviewed each year. Meanwhile the FB-111 is scheduled to start coming into the inventory during 1969. Minuteman deployment stabilized at 1000 during 1967. The Titan II force was scheduled for phaseout; however, our request to extend this system has been approved.

The modernization of the Minuteman continues with completion now scheduled for [deleted].

Current capabilities

The programmed bomber and missile forces must enable SAC to respond to an attack under the worst condition of war initiation. This would be a minimum warning attack upon us while our forces are in a day-to-day alert posture. The survivability of the Minuteman and Titan II force is not particularly affected by warning as they are always on alert in hardened silos. However, the survivability of the bomber force depends on its ability to react to warning. For this reason, although we maintain the capability to generate the entire bomber force in [deleted] we measure our immediate bomber potential in terms of the 40% day-to-day alert force.

Aircraft.—Our basic concepts for aircraft operation remain essentially the same. At our home bases, the 40% of our bombers normally on alert, and whatever follow-on force we may have generated, launch within the warning time provided by the Ballistic Missile Early Warning System. We still have a reflex requirement at forward bases. Tankers are positioned ahead of the faster B-58's and to support the airborne alert when implemented; B-52's are moved closer to [deleted] targets. The long established survival enhancement procedures—airborne alert, the positive control launch, and the minimum reaction posture (where the aircraft are positioned at the end of the runway with engines running)—still apply to the whole force. Tactics to penetrate the defenses in the forward area remain essentially the same. [Deleted.]

Missiles.—With respect to missiles, however, we have seen some significant changes. The incorporation of Minuteman II enhances both effectiveness and flexibility. We can remotely select any one of [deleted] targets that are pre-stored in the missile's computer and we can program launches of various combinations of the force with a variety of timing options. Finally Minuteman II introduces penetration aids, better accuracy and improved re-entry vehicle hardness.

Airborne launch control system.—In addition, a new capability to launch all the Minuteman missiles from the air is already in almost [deleted] the force. To be completed by [deleted] this Airborne Launch Control System (ALCS) forces the enemy to attack each silo instead of the much less numerous launch control centers if he is to deter missile launches.

Reconnaissance.—In addition to our retaliatory strike power, SAC maintains a diversified reconnaissance capability consisting of [deleted] devices as a part of the world-wide reconnaissance plan. National requirements are consolidated and SAC is tasked to conduct [deleted] against these objectives. SAC Headquarters plans, executes and actively monitors this [deleted] reconnaissance force. The take from these sensors provides selective data to the several National agencies.

To perform these tasks, we have four highly specialized types of aircraft. The versatile U-2 and the advanced SR-71 multi-sensor aircraft, and the RC-135C and M [deleted] platforms. Altogether, this family of collection systems represents a greatly improved capability to perform [deleted] all-weather reconnaissance.

Command and control.—The SAC Command and Control System is the means by which we plan, monitor, and execute strategic operations. It is focused around the primary command center at SAC Headquarters with alternates at each of the three numbered Air Forces.

PACCS.—Additionally, these ground elements are backed up by SAC's Post Attack Command and Control System (PACCS) which includes an alternate command post, commanded by a General Officer, continuously airborne. This provides a highly survivable back up command control capability for SAC forces. Our current system which includes the Minuteman airborne launch capability assures that Strategic Air Command forces are directly and immediately responsive to the National Command Authority in the face of even the most severe threat.

Summary of current capabilities

Summarizing our current posture, I feel that our assured destruction capability appears adequate for the next few years. However, in view of the improving Soviet strategic force posture, we will be in an increasingly less favorable position to accomplish both the assured destruction and damage limiting tasks. I will now discuss some of the actions and proposed force improvements needed to maintain our deterrent posture.

Posture and procedural changes

Posture and procedural changes to SAC's established methods of operation result largely from warning inadequacies. In some cases we can no longer depend on the [deleted] BMEWS warning. Both the submarine launched ballistic missiles (SLBMs) and the FOBS threat can bypass the existing BMEWS.

Warning systems are being introduced to counter each threat. At present, we are using [deleted]. The [deleted] over-the-horizon radar system has been expedited to counter the FOBS threat. However, warning time from any of these sources is such that, to react, SAC has made several changes in procedures.

Quicker reaction.—To counter the initial SLBM threat, we have developed an improved reaction procedure for the alert forces which enables the first alert aircraft to begin take-off roll in [deleted] minutes—[deleted] of the time previously required. This tactic, coupled with our planned launch rates of about [deleted] aircraft per minute, improves alert force survival with the reduced warning times available [deleted].

Force dispersal.—But this concept will not allow sufficient time to launch the entire force, even if a period of tension has triggered its generation. Therefore, to give added protection for the fully generated force we plan to disperse to [deleted] additional bases.

Satellite basing.—However, the foregoing capabilities may not be enough. Warning times at some bases will remain inadequate for full alert survival against [deleted]. Particularly in the latter case we must continue to rely on the improvised procedures based on having some advance indication that an attack is likely. For these reasons SAC is currently working with the Air Staff to develop an even faster reaction capability for its alert forces which would be maintained continuously. This concept calls for wide dispersal of the day-to-day alert force among satellite bases. This change in our basing posture would not only improve the reaction time of the alert force, but would also complicate the enemy's targeting problem. In the event additional forces were generated, they too would be dispersed.

Airborne alert.—In addition to these changes SAC has modified airborne alert with a new concept of employment which we call SEAGA—the Selective Employment of Air and Ground Alert. This program, to be instituted in [deleted] permits us to enhance the survivability of our normal alert force by getting it airborne at a moment's notice. The sorties launched are those that we feel would contribute the most in any attack against the Sino-Soviet threats. In a sense, it is a selective positive control launch that can be kept airborne for [deleted]. This enables us to employ it, as a show of force, with no degradation to the SIOP. We consider it a major step toward enduring survival of some of the bombers.

Missile procedures.—I have covered new procedures as they pertain to aircraft. In the missile area the only procedural changes that have been made are to accommodate the airborne launch capability and in the field of tactics to minimize the risk of losses. These center around changes in our firing doctrines.

Essential improvements and modifications

I have discussed those threats we have been able to address through our inherent systems flexibility. To further satisfy the requirements, we must look for essential improvements and modifications.

Bomber life extension.—First are changes basic to the viability of the bomber force—life extension of the B-52 fleet. A sufficient number of the early series B-52's have adequate safe service life remaining to make their planned retirement date without further rework. The B-52D's, which support Southeast Asia, require a wing strengthening modification. This work has been under way since October 1966, and will allow the D's to meet their phaseout schedule of FY 71-72 provided the current sortie rate in SEA does not continue past [deleted]. An increase in missions over the [deleted] sortie rate would, of course, shorten the time period the aircraft could remain operational. As a hedge against continuing high levels of conventional operations, SAC has requested the C, E, and F series aircraft be modified to the Southeast Asia configuration.

Since the seventeen squadrons of G's and H's are programmed to remain in the inventory for a considerable time, two structural improvements for these aircraft are under way or scheduled for the near future. This will extend their service life into the late 70's.

The fatigue stress points of the B-58 are being strengthened during their modification/IRAN cycle to insure structural integrity. Installation of a [deleted] and an [deleted] system will be accomplished in the near future.

Bomber penetration.—Second is a family of modifications to address the increasing bomber penetration threat.

Terrain avoidance.—As I noted earlier, current Soviet SAMs are not a serious [deleted] threat only because we penetrate largely at low level. It is very important that we maintain the capability to stay low enough to underfly the SAM threat envelope. [Deleted.]

SRAM.—[Deleted] SRAM, now authorized for both the FB-111 and [deleted] B-52's, will complement the Hound Dog in suppressing defenses. [Deleted] capability, equipment of all B-52G and H units with SRAM has been requested. I think it noteworthy that the flexibility of the SRAM will frequently enable us to stand off and deliver the missile through the defenses directly against objective targets.

ECM.—The Soviet Air Defense network appears to be the most flexible element in his defensive posture. Their airborne interceptor-SAM mix utilizes a wide spectrum of electronic devices for radar warning, fire control, and communications. To enhance our capability to penetrate these increasingly sophisticated defenses, we conduct periodic exercises to determine the effectiveness of our Electronic Counter-Measures. These exercises, plus Air Force experience in Vietnam, indicate that ECM is effective against enemy electronics, but that all elements of the enemy air defense network must be countered. In view of this, each of our aircraft should carry optimized ECM equipment to most effectively counter the wide frequency range of Soviet radars and Air Force efforts are directed toward this goal.

[Deleted.]

Missiles.—Earliest improvements in the missile force are largely in the form of modifications to improve the overall survivability of Minuteman II both in silo and in flight. Additional quality improvements are being programmed for the force with Minuteman III. In addition to the capabilities of Minuteman II pre-

viously discussed, Minuteman III provides up to [deleted] re-entry vehicles per booster. Minuteman III allows the option of delivering weapons to the same or separate targets in combination with area and terminal penetration aids. When Minuteman III replaces the older Minuteman I, there will be a significant increase in the number of re-entry vehicles in the missile force.

[Deleted] *silo development*.—[Deleted.] As a hedge, the Air Force is developing a very hard [deleted] silo for use with either the Minuteman III or the larger, Advanced ICBM. This hard silo should be approximately [deleted] more survivable than our [deleted] Minuteman Silos. To combat the increasing enemy threat, SAC has requested additional Minutemen to be placed into the new silos.

New systems

These new tactics, procedures, and improvements, which I have enumerated, are oriented to counter most of the earlier threats. However, the improvements postulated for the Soviet forces make further adaptation less productive and argue for new systems which can more effectively address the increasing threat. First I'd like to talk about command and control.

[Deleted.] I have previously discussed the [deleted] warning system which was expedited to counter the FOBS threat. [Deleted.]

Advanced airborne command post.—[Deleted.] although the PACCS system is capable and survivable, it has limitations which cannot be overcome with the present tanker-size aircraft. SAC, in conjunction with JCS, has therefore stated a requirement for a large follow-on aircraft to be used as an Advanced Airborne Command Post. The advent of large cargo aircraft offers desired additional capabilities which include: longer endurance on station, larger battle staffs, more data processing and control equipment, and an easier adaptability to satellite communications. The future capability to receive information from [deleted] other surveillance/reconnaissance systems and to process and correlate the data on-board and communicate with the forces via ground, air, or spaceborne communications systems will enable the advanced airborne command post to provide SAC with a *flexible* and *survivable* real time battle management capability. We could have an initial capability [deleted].

Advanced capability tanker.—The prospect of [deleted] has brought into focus our need for an advanced capability tanker. Even with the reduced bomber force of the early 1970s, our programmed KC-135 fleet will permit [deleted]. Pre-strike tactics and the acceptance of higher post-strike risks have enabled us to live with such profiles. In the early 1970s both pre- and post-strike attrition may increase unless we can improve our low level capability. [Deleted.] It would also improve our dispersal capability, improve our airborne alert potential during crisis periods, increase flexibility of entry points and penetrator routes, and enhance recovery. The Air Staff is studying SAC's request for a new tanker.

Advanced ICBM.—Now for a few final words concerning missiles. In the mid-1970s the Soviets could increase both the number and quality of their ICBM and ABM forces. Should the Soviets proceed in that direction, Air Force studies indicate that the most practicable solution is an Advanced ICBM, [deleted]. Advantages of this larger missile include: increased survivable throw weight, flexibility through advanced reentry vehicles, new penetration aids, increased range with full payload and increased accuracy, [deleted]. Furthermore, should penetration aids prove ineffective, the [deleted] equipped with a large number of [deleted] warheads (currently in the concept phase) may be our best hedge against a large, sophisticated enemy ABM deployment. We think there should be an early go-ahead for the Advanced ICBM.

Advanced bomber.—Finally, I would like to say a few words about our need for a new bomber. The many new penetration aids will assist our newer B-52s to operate with acceptable losses into the early 70's, but modifications to existing systems cannot be continued indefinitely. The characteristics of the B-52 do not permit taking full advantage of these new developments and the FB-111 is limited in its ability to accommodate them due to volume and payload constraints. In view of the already evident improvements in the Soviet Air Defense System and the post-1975 uncertainties, it is essential that we proceed with the necessary steps to insure earliest availability of the Advanced Manned Strategic Aircraft (AMSA). Studies indicate this bomber is cost effective for its role in strategic deterrence. In addition, the employment flexibility afforded by AMSA's high performance, long range, precision delivery of large payloads, and advanced penetration aids will significantly enhance our effectiveness in non-nuclear conflicts. The earliest date that the first AMSA wing could be deployed would be 1976—even if we start Contract Definition immediately. Full force

deployment would occur two years later. I strongly believe that contract definition should proceed.

Support in Southeast Asia

As a natural follow-on to my remarks on the conventional capability of the AMSA, I would like to say a few words about SAC's activities in Southeast Asia.

In August 1964, we began by providing tanker support for U.S. fighter operations in the area. In June 1965, we launched the first B-52 strike in direct support of U.S. military operations in South Vietnam. Since that time, the bombing tempo has increased steadily until we reached a rate of [deleted] sorties flown in February. Recently, when the threat to Khe Sanh appeared to be at its peak, SAC redirected its B-52 strike capability and, for the period from January through March, flew an average of [deleted] sorties a day to counter the threat. At the same time, we provided additional sorties each day to strike other important targets.

As Gen. Westmoreland stated in an October message to me, "The application of B-52 strikes in the demilitarized zone during the past month contributed greatly to the disruption of enemy operations in that area * * *. I am confident his losses have been heavy and that his decision to disengage was brought about by your strikes."

Of equal importance to the U.S. effort has been our tanker support. The tanker requirements have increased continuously achieving peak averages of [deleted] refuelings and [deleted] gallons each day. Additionally, these tankers have made several noteworthy saves of tactical aircraft critically short on fuel by improvising emergency air refuelings which permitted the fighters to reach a friendly airfield.

All of our tanker crews and more than half of our B-52 crews have participated in SAC operations in Southeast Asia. New tactics and equipment have been developed to support this effort, all of which have improved our capability in either nuclear or non-nuclear war.

Summary

As has been stated, deterrence of strategic nuclear war is the principal objective of U.S. strategic policy. Further, if deterrence fails, our strategic force capability must provide for termination of hostilities on terms advantageous to the United States. I believe that today the strategic forces of the United States can inflict serious losses on the Sino-Soviet complex in any nuclear exchange. [Deleted.]

I do not feel that we as a nation can be conservative with our deterrent. General McConnell's posture statement emphasized that we are faced with a formidable array of Soviet capabilities and options. Soviet emphasis on R&D suggests they intend to make the most of their opportunities. I would hope that our intelligence will reveal new threats in sufficient time for us to go through the lengthy process of fielding proven counter capabilities. As we see it, the deterrent equation functions most reliably when forces in being are evident.

Mr. Chairman, I thank you and the members of the Subcommittee for the honor of appearing before you. I would be pleased at this time to answer your questions.

STATEMENT OF GEN. JOSEPH J. NAZZARO, COMMANDER IN CHIEF, STRATEGIC AIR COMMAND

General NAZZARO. Mr. Chairman, members of the subcommittee, it is a privilege to be here to discuss with you the posture and capabilities of the Strategic Air Command. My remarks will address the present and near term future of the command.

The former Secretary of Defense has stated: "The foundation of our security is the deterrence of a Soviet nuclear attack." SAC is a major contributor to that deterrent capability by being responsive to the JCS strategy. General Wheeler, Chairman, JCS, expresses this strategy as being able "* * * To deter aggression at any level * * *" should deterrence fail, to terminate hostilities, in concert with our allies, under conditions of relative advantage while limiting damage

to United States and minimizing damage to the United States and allied interests."

In any discussion of deterrence it is important to clearly understand that deterrence is a state of mind brought about by a credible threat of unacceptable counteractions. The force posture required to create a credible deterrent cannot be calculated with a high degree of certainty. In order to provide a broad range of options to the national authority, I believe that our strategic forces must appear to the enemy to be capable of attacking and destroying his military forces as well as a large portion of his population and industrial base even after we have received an initial attack.

In my remarks I will describe various courses of action that are available to SAC in maintaining its deterrent posture.

Today the SAC force consists of 620 bombers and 1,054 missiles. We have completed the phaseout of some of the older B-52's. Although SAC has requested their retention, the entire B-52 C through F force and the B-58's are scheduled to complete their phaseout by the end of fiscal years 1971 and 1972. The B-58 phaseout schedule is being reviewed each year. Meanwhile, the FB-111 is scheduled to start coming into the inventory during 1969. MINUTEMAN deployment stabilized at 1,000 during 1967.

The modernization of the MINUTEMAN continues with completion now scheduled for [deleted].

The programed bomber and missile forces must enable SAC to respond to an attack under the worst condition of war initiation. This would be a minimum warning attack upon us while our forces are in a day-to-day alert posture. The survivability of the MINUTEMAN and TITAN II force is not particularly affected by warning as they are always on alert in hardened silos. However, the survivability of the bomber force depends on its ability to react to warning. For this reason, although we maintain the capability to generate the entire bomber force in [deleted] we measure our immediate bomber potential in terms of the 40-percent day-to-day alert force.

AIRCRAFT

Our basic concepts for aircraft operation remain essentially the same. At our home bases, the 40 percent of our bombers normally on alert, and whatever follow-on force we may have generated, launch within the warning time provided by the ballistic missile early warning system. We still have a reflex requirement at forward bases. Tankers are positioned ahead of the faster B-58's and to support the airborne alert when implemented; B-52's are moved closer to [deleted] targets. The long-established survival enhancement procedures—airborne alert, the positive control launch, and the minimum reaction posture—where the aircraft are positioned at the end of the runway with engines running—still apply to the whole force.

MISSILES

With respect to missiles, however, we have seen some significant changes. The incorporation of Minuteman II enhances both effectiveness and flexibility. We can remotely select any one of [deleted] targets

that are prestored in the missile's computer and we can program launches of various combinations of the force with a variety of timing options. Finally, MINUTEMAN II introduces penetration aids, better accuracy, and improved reentry vehicle hardness.

AIRBORNE LAUNCH CONTROL SYSTEM

In addition, a new capability to launch all the MINUTEMAN missiles from the air is already in almost [deleted] the force. To be completed by [deleted] this airborne launch control system (ALCS) forces the enemy to attack each silo instead of the much less numerous launch control centers if he is to deter missile launches.

COMMAND AND CONTROL

The SAC command and control system is the means by which we plan, monitor, and execute strategic operations. It is focused around the primary command center at SAC Headquarters with alternates at each of the three numbered Air Forces.

PACCS

Additionally, these ground elements are backed up by SAC's post-attack command and control system (PACCS) which includes an alternate command post, commanded by a general officer, continuously airborne. This provides a highly survivable backup command control capability for SAC forces. Our current system, which includes the Minuteman airborne launch capability, assures that Strategic Air Command forces are directly and immediately responsive to the national command authority in the face of even the most severe threat.

SUMMARY OF CURRENT CAPABILITIES

Summarizing our current posture, I feel that our assured-destruction capability appears adequate for the next few years. However, in view of the improving Soviet strategic force posture, we will be in an increasingly less favorable position to accomplish both the assured-destruction and damage-limiting tasks.

Posture and procedural changes to SAC's established methods of operation result largely from warning inadequacies. In some cases we can no longer depend on the nominal 15 minutes of BMEWS warning. Both the submarine-launched ballistic missiles—SLBM's—and the FOBS threat can bypass the existing BMEWS.

Warning systems are being introduced to counter each threat. At present, we are using an [deleted]. The [deleted] over-the-horizon radar system has been expedited to counter the FOBS threat. However, warning time from any of these sources is such that, to react, SAC has made several changes in our procedures.

QUICKER REACTION

To counter the initial SLBM threat, we have developed an improved reaction procedure for the alert forces which enables the

first alert aircraft to begin takeoff roll in [deleted] minutes—[deleted] of the time previously required.

FORCE DISPERSAL

But this concept will not allow sufficient time to launch the entire force, even if a period of tension has triggered its generation. Therefore, to give added protection for the fully generated force, we plan to disperse to [deleted] additional bases.

SATELLITE BASING

The foregoing capabilities may not be enough. Warning times at some bases will remain inadequate for full alert survival [deleted]. Particularly in the latter case we must continue to rely on the improvised procedures based on having some advance indication that an attack is likely. For these reasons SAC is currently working with the Air Staff to develop an even faster reaction capability for its alert forces which would be maintained continuously. This concept calls for wide dispersal of the day-to-day alert force among satellite bases. This change in our basing posture would not only improve the reaction time of the alert force, but would also complicate the enemy's targeting problem. In the event additional forces were generated, they, too, would be dispersed.

AIRBORNE ALERT

In addition to these changes, SAC has modified airborne alert with a new concept of employment which we call SEAGA—the selective employment of air and ground alert. This program, to be instituted in [deleted] permits us to enhance the survivability of our normal alert force by getting it airborne at a moment's notice.

MISSILE PROCEDURES

I have covered new procedures as they pertain to aircraft. In the missile area the only procedural changes that have been made are to accommodate the airborne launch capability and in the field of tactics to minimize the risk of losses.

I have discussed those threats we have been able to address through our inherent systems flexibility. To further satisfy the requirements, we must look for essential improvements and modifications.

BOMBER LIFE EXTENSION

First are changes basic to the viability of the bomber force—life extension of the B-52 fleet. A sufficient number of the early series B-52's have adequate service life remaining to make their planned retirement date without further rework.

As a hedge against continuing high levels of conventional operations, SAC has requested the C, E, and F series aircraft be modified to the Southeast Asia configuration.

Since the 17 squadrons of G's and H's are programed to remain in the inventory for a considerable time, two structural improvements

for these aircraft are underway or scheduled for the near future. This will extend their service life into the late 1970's.

The fatigue stress points of the B-58 are being strengthened during their modification/IRAN cycle to insure structural integrity. Installation of a [deleted] system will be accomplished in the near future.

BOMBER PENETRATION

Second is a family of modifications to address the increasing bomber penetration threat.

Current Soviet SAM's are not a serious [deleted] threat only because we penetrate largely at low level. It is very important that we maintain the capability to stay low enough to underfly the SAM threat envelope. [Deleted.]

SRAM

[Deleted.]

SRAM, now authorized for both the FB-111 and [deleted] of B-52's, will complement the HOUND DOG in suppressing defenses. [Deleted] capability, equipage of all B-52 G and H units with SRAM has been requested.

ECM

The Soviet air defense network appears to be the most flexible element in his defensive posture. Their airborne interceptor-SAM mix utilizes a wide spectrum of electronic devices for radar warning, fire control, and communications. To enhance our capability to penetrate these increasingly sophisticated defenses, we conduct periodic exercises to determine the effectiveness of our electronic countermeasures. These exercises, plus Air Force experience in Vietnam, indicate that ECM is effective against enemy electronics, but that all elements of the enemy air defense network must be countered. In view of this, each of our aircraft should carry optimized ECM equipment to most effectively counter the wide frequency range of Soviet radars, and Air Force efforts are directed toward this goal.

MISSILES

Earliest improvements in the missile force are largely in the form of modifications to improve the overall survivability of Minuteman II both in silo and in flight. Additional quality improvements are being programed for the force with MINUTEMAN III. In addition to the capabilities of MINUTEMAN II previously discussed, MINUTEMAN III provides up to [deleted] reentry vehicles per booster. MINUTEMAN III allows the option of delivering weapons to the same or separate targets in combination with area and terminal penetration aids. When MINUTEMAN III replaces the older MINUTEMAN I, there will be a significant increase in the number of reentry vehicles in the missile force.

These new tactics, procedures, and improvements, which I have enumerated, are oriented to counter most of the earlier threats. However, the improvements postulated for the Soviet forces make further adaptation less productive and argue for new systems which can more effectively address the increasing threat.

Secretary Brown and General McConnell have discussed the threat and future weapons systems, so I would like to talk only about command and control. I have previously discussed the [deleted] warning system which was expedited to counter the FOBS threat. [Deleted.]

I would like to say a few words about SAC's activities in Southeast Asia.

In August 1964, we began by providing tanker support for U.S. fighter operations in the area. In June 1965, we launched the first B-52 strike in direct support of U.S. military operations in South Vietnam. Since that time, the bombing tempo has increased steadily until we reached a sortie rate of [deleted] sorties flown in February. Recently, when the threat to Khe Sanh appeared to be at its peak, SAC redirected its B-52 strike capability and, for the period from January through March, flew an average of [deleted] sorties a day to counter the threat. At the same time, we provided additional sorties each day to strike other important targets.

Of equal importance to the U.S. effort has been our tanker support. The tanker requirements have increased continuously achieving peak averages of [deleted] refuelings and [deleted] gallons each day. Additionally, these tankers have made several noteworthy saves of tactical aircraft critically short on fuel by improvising emergency air refuelings which permitted the fighters to reach a friendly airfield.

All of our tanker crews and more than half of our B-52 crews have participated in SAC operations in Southeast Asia. New tactics and equipment have been developed to support this effort, all of which have improved our capability in either nuclear or nonnuclear war.

As has been stated, deterrence of strategic nuclear war is the principal objective of U.S. strategic policy. Further, if deterrence fails, our strategic force capability must provide for termination of hostilities on terms advantageous to the United States. I believe that today the strategic forces of the United States can inflict serious losses on the Sino-Soviet complex in any nuclear exchange. [Deleted.]

I do not feel that we as a nation can be conservative with our deterrent.

I would hope that our intelligence will reveal new threats in sufficient time for us to go through the lengthy process of fielding proven counter capabilities. As we see it, the deterrent equation functions most reliably when forces in being are evident.

Mr. Chairman, I thank you and the members of the subcommittee for the honor of appearing before you. I would be pleased at this time to answer your questions.

Senator STENNIS. Gentlemen, we thank you. You certainly have remarkable statements. The force and impact of them together adds up—in my layman's concept of it—the only real defense is everything we could have offensively, and even that wouldn't be enough if they ever attacked.

THE CHINESE THREAT

I have very few questions. I think it would be well if we utilize the time we have this morning to let the Senators ask questions.

I notice, gentlemen, that General McConnell devotes one two-line sentence to the Chinese threat; Secretary Brown beats him on that: he had about three lines, I believe.

Of course what you said about one applies to the other in a way.

What about that, General? You didn't develop anything on that in detail. You didn't give us any extensive thought on it in your statement.

Do you want to say a word in response to what I have said?

General McCONNELL. Yes, sir; Mr. Chairman, I would be glad to.

Intelligence estimates that by 1969 the Chinese can have a few medium range ballistic missiles, and by the early 1970's, a few, [deleted] intercontinental ballistic missiles.

Senator STENNIS. 1970.

General McCONNELL. By 1970, yes. They naturally would constitute a hazard to us. The Chinese are not particularly noted for their rational actions. [Deleted.]

However, it is my personal opinion that they would be extremely stupid to launch an attack against the United States or against any of our oversea bases when we could absolutely destroy them without any more damage to ourselves than we had already incurred.

I am sure they understand that—even though they are highly irrational people.

Senator STENNIS. Do you want to add something, Mr. Secretary?

Secretary BROWN. Only this, Mr. Chairman. Damage limiting, which is so difficult for us to do against the Soviet Union, or for them to do against us, for that matter, is quite a lot easier against the Chinese.

The SENTINEL system should do a reasonably good job of that through the 1970's when it comes in, together with our other defenses. Of course, an assured destruction capability in the sense of being able to completely wipe out their urban population is something that we have essentially automatically as a consequence of our actions vis-a-vis the Soviet Union. So they are a much easier target, both for assured destruction and for damage limitation.

That doesn't mean that we don't have to devote some attention to that.

Senator STENNIS. Of course, our offensive power can be brought to bear in any direction.

Secretary BROWN. Yes, sir.

Senator STENNIS. General, do you want to comment on that? During the consideration of the authorization bill, on the floor of the Senate, an amendment was offered to eliminate the ABM system. I opposed it. I could have been better prepared, perhaps. It is impressed on my mind that this is a special problem. I would like you gentlemen to comment on it.

General NAZZARO. Mr. Chairman, I see no difficulty in the future in carrying out our assured destruction task against China, and except for their ICBM, which SENTINEL is being programed for, limit damage from them.

Senator STENNIS. Of course, we have no evidence of any real defense system the Red Chinese have, in any event.

General McCONNELL. Not against missiles. They have a bomber defense of sorts.

Senator STENNIS. What bomber defenses do they have?

General McCONNELL. They have the same kind of bomber defense we do—radar, for early warning, GCI control. [Deleted.]

Senator STENNIS. All right.

Mrs. Smith, may I call on you next, please?

Senator SMITH. Yes, Mr. Chairman. I want to thank you and the staff for getting the statements to me early enough so I could read them last night. I found them very interesting, excellent and objective. I will defer my time to you and Mr. Kendall, if I may.

Senator STENNIS. Thank you. Senator Symington?

COMPARISON OF SOVIET AND U.S. BOMBER FORCES

Senator SYMINGTON. General McConnell, as I read your testimony, we have 620 bombers and the Russians have [deleted]; is that right?

General McCONNELL. Yes, sir.

Senator SYMINGTON. You mentioned—

General McCONNELL. All of those [deleted] cannot reach us, Senator.

Senator SYMINGTON. Now, you mention on page 5 the BISON and the BEAR. What airplane would you say the BEAR is closest to—perhaps the B-36?

General McCONNELL. B-36; yes, sir; in some ways, but we really have no comparable aircraft.

Senator SYMINGTON. The B-36 was started in 1941, earlier, because I saw the first mockup in 1941. What year was the BEAR started?

General McCONNELL. I am sure I can supply that answer for the record.

Secretary BROWN. I think it went into the inventory in about 1954. (The information follows:)

We estimate that development of the "BEAR" began in about 1949-50. It was initially observed (seven at one time) in the summer of 1955 during practices for an air-show. It became operational five months later in the same year, 1955. We cannot really equate the BEAR to the B-36. The BEAR is powered by turbine driven propellers, instead of piston engines, and has a swept wing like the B-52. Its closest U.S. counterpart is the B-52. Its range is comparable to the B-52.

Senator SYMINGTON. What year, the BISON?

General McCONNELL. I will have to get that answer for the record, Senator. It is a later aircraft, of course.

(The information follows:)

Development of the BISON, began in 1950-51 on a crash basis. The prototype was initially observed in 1953 and the second and third prototypes were seen in 1955. Initial operational capability also occurred in 1955.

Senator SYMINGTON. What airplane do we have that corresponds to the BISON?

General McCONNELL. The B-52—a much better aircraft. The same type of aircraft, but much better.

Senator SYMINGTON. The third bomber referred to is the BLINDER; correct?

General McCONNELL. Yes, sir.

Senator SYMINGTON. Which is comparable to the B-58?

General McCONNELL. Roughly; yes, sir.

Senator SYMINGTON. Actually the performance of the B-58 is better than the BLINDER.

General McCONNELL. It's better; yes, sir.

Senator SYMINGTON. Why did we cancel making B-58's if the BLINDER is the best and newest Soviet bomber?

General McCONNELL. The program is to phase it out in 1971, Senator. The Joint Chiefs of Staff and the Air Force continue to watch

it all the time, and will make recommendations as time goes on as to whether we should retain it in service. Actually we are making certain reasonable modifications on the aircraft at small expense so that if it is deemed appropriate to retain it in service, we will be able to do so, and it can still perform.

Senator SYMINGTON. I said "cancel." I meant "terminate production."

General McCONNELL. It terminated production a long time ago, sir. Senator SYMINGTON. What year?

General McCONNELL. 1962, I think.

Senator SYMINGTON. It might have been a little earlier.

General McCONNELL. I owned at one time all the B-58's in the force, and I think we bought 116.

Senator SYMINGTON. In other words, 8 years ago we terminated production of a bomber which is superior to the best the Russians have built as of today; correct?

General McCONNELL. The Strategic Air Command recommended against the termination of the contract, but it was terminated anyhow.

SOVIET BOMBER REFUELING CAPABILITY

Senator SYMINGTON. I think they were right. Now, you say something here about tankers being converted in [deleted] or bombers being converted in [deleted] to tankers. Isn't that a rather short period?

General McCONNELL. No, sir; I don't think it is considered to be too short [deleted].

Senator SYMINGTON. How long would it take to convert a B-52 into a KC-135?

General McCONNELL. We never could. The B-52 is not built that way. You might remember, Senator, there was talk some time ago, when we started in for the jet tankers, to convert the B-36 to a tanker, and we determined that it was impossible.

Senator SYMINGTON. Thank you.

Now, you mentioned [deleted] medium bombers would be used against the United States. Would that be a one-way mission?

General McCONNELL. [Deleted.]

Senator SYMINGTON. If you are going to refuel your BISON and your BEARS and your [deleted] medium bombers, you are going to have [deleted] tankers pretty busy; aren't you?

General McCONNELL. Yes, sir. However, not all of these aircraft would have to be refueled.

U.S. FIGHTERS COMPARED WITH SOVIET FIGHTERS

Senator SYMINGTON. You mentioned the FIDDLER as a long-range interceptor which was introduced operationally in 1966. That's correct, is it not?

General McCONNELL. Yes, sir.

Senator SYMINGTON. When was the last long-range interceptor that we introduced?

General McCONNELL. We do not have a long-range interceptor.

Senator SYMINGTON. Thank you. You mentioned the FOXBAT—

General McCONNELL. The last one we introduced, [deleted] is the F-106.

Senator SYMINGTON. What is the range of the FIDDLER?

General McCONNELL. [Deleted.]

Senator SYMINGTON. Is that range or radius?

General McCONNELL. I would have to ask about that. I think it's radius. Yes, it is radius.

Senator SYMINGTON. And what is the radius of the 106?

General McCONNELL. At high altitude, it's about 700.

Senator SYMINGTON. Now, you mention the FOXBAT. But, as long as the general mentions the FOXBAT [deleted] we know we haven't anything like that. If we could ever end all the arguments and get one, what year would be the first year we had operating capability?

General McCONNELL. [Deleted.] Now, I mention that just in passing, because what we are interested in at this hearing is its use as an interceptor. However, the F-111A improved clear on down to the D should be able, in my opinion, to carry out very well the tactical ground attack role, together with the F-4's. We intend to have by [deleted] an interceptor which we call the FX, and all the planning has already been done on that. Actually, we have got a go-ahead on the engine now. We anticipate contract definition authority either in December or January. That aircraft will be superior, in my opinion, to any fighter aircraft that we will use in the tactical forces. It is to be made so that its design will be optimized for air-to-air combat, and if we can hang anything on it without adding any weight or expense or other radar equipment or navigation aids, so it can be used to some extent in air-to-ground combat, we will do that. But we are not going to sacrifice one iota of air-to-air capability to put anything on that aircraft so that it can attack the ground. For that role we will depend on the F-111A's, the F-4, and maybe an AX that we will have later on.

Senator SYMINGTON. You say as long as we maintain a bomber force capable of surviving an initial attack, and capable of penetrating below [deleted]. How far into the Soviet Union do you think a bomber could penetrate at [deleted].

General McCONNELL. Below [deleted].

Senator SYMINGTON. Below [deleted]?

General McCONNELL. If it had the proper ECM capability, and unless [deleted].

Senator SYMINGTON. Excuse me. [Deleted.]

General McCONNELL. [Deleted.]

Senator SYMINGTON. You say, [deleted]?

General McCONNELL. [Deleted?]

Senator SYMINGTON. Yes.

General McCONNELL. We anticipate that it will have that. [Deleted.]

Secretary BROWN. There is no evidence that it has such a capability now. The intelligence estimates that it will have one comes from the deduction that they ought to want to have one.

Senator SYMINGTON. I didn't flush it, Mr. Secretary. It was in the general's statement.

Secretary BROWN. Yes, indeed. And we are explaining it.

General McCONNELL. With proper defenses, I should think a bomber could be able to penetrate [deleted] with reasonable attrition.

Senator SYMINGTON. Thank you, Mr. Chairman.

Senator STENNIS. Yes, sir; thank you.

Gentlemen, under the circumstances I will call on Senator Miller next. He has been here all morning.

Senator MILLER. That's all right, Mr. Chairman. I have not been called. I have no problem.

Senator STENNIS. Senator Thurmond, are you ready?

U.S. FORCES DESIGNED FOR SECOND STRIKE CAPABILITY

Senator THURMOND. Thank you, Mr. Chairman. Mr. Secretary, does the concentration on a second strike capability mean that it is well settled now that the United States is not considering a first strike capability?

Secretary BROWN. We design our forces, Senator Thurmond, so that they will be able to survive a first strike, and we don't buy forces that would have only a first strike capability. Although we don't intend to make a first strike, the United States might attack various targets in the Soviet Union depending upon what they had attacked in the United States. But we are not designing our forces to carry out a first strike.

PHASEOUT AND ACCESSIONS SCHEDULE FOR BOMBERS

Senator THURMOND. Now, on page 5, you indicate that we are to lose 75 bombers between fiscal year 1970 and 1971. Now, does this mean that the loss will actually take place, or is the decline in bomber strength to be equally apportioned beginning now?

Secretary BROWN. The difference between 540 and 465, Senator Thurmond, is the difference between the phaseouts of bombers and accessions of new bombers. We will be phasing out some B-52C to F's, and phasing in some FB-111's. But there will be some phaseouts—there are some phaseouts scheduled for fiscal 1969—four squadrons of B-52's are scheduled for phaseout in fiscal 1969. The exact schedule of that is still being discussed with the Office of the Secretary of Defense.

FOBS WARNING SYSTEM

Senator THURMOND. Now, at page 18 you indicate that our FOBS warning system is considered adequate. Dr. Foster told us earlier that our national bomber warning system is not. Would you care to comment on that?

Secretary BROWN. I would have to see his exact words before I commented on them, Senator Thurmond. What I mean by what I say is that the [deleted] system, which is in being now, and is tied into the NORAD system, does provide us with warning of Soviet FOBS launches right now, and I am confident that the number of FOBS that the Soviets would have to launch to impact on our bomber forces we would detect, and General Nazzaro would flush the bomber forces.

I don't mean to say this is all I think we should do. We are planning to expand the [deleted] system to give wider coverage, and we are planning to bring in [deleted]. But as of now, I would say that our FOBS warning is adequate for the threat as it exists now.

Senator THURMOND. On page 20 you indicate a preference for the supersonic advanced bomber. On page 25, while still discussing the

advanced bomber, you state that the advanced bomber could penetrate at a much higher subsonic speed than the B-52.

Do you advocate subsonic or supersonic bombers in this context?

Secretary BROWN. I advocate, Senator Thurmond, a bomber which has the capability to fly at a supersonic speed at high altitude; because I can foresee, and I know General Nazzaro can foresee, defenses which would make you want to do some of the penetration at supersonic speed at high altitude. Against a [deleted] our bombers would have a higher penetration capability out on the fringes with that supersonic speed. But I don't believe that we will want to fly supersonically the entire mission.

What I suggest here, Senator Thurmond, is a bomber capable of supersonic flight, but one which would not always fly supersonically in combat.

RATIONALE FOR POLICY ON AIR DEFENSE

Senator THURMOND. Now, on page 30 you state that a highly effective defense of our cities is not feasible. Yet you say in the same paragraph that a moderate level of defense would help to deter an enemy attack and limit damage if the attack occurs.

How do you rationalize that argument? How do you determine the cutoff point for a moderate level of defense?

Secretary BROWN. That is a very complicated question of judgment, Senator Thurmond.

One way of determining what would be a moderate level of air defense, which is what I am talking about here, is to say that its 10-year cost might equal that which we are willing to put into missile defense. The numbers that I have quoted here are comparable with that. But I believe that our air defense must be directed only secondarily at actual damage limitation. I don't think it can accomplish a high degree of damage limitation; that is, defense of our cities. I think it can do a better job of defending our offensive forces, which are harder for the enemy to knock out. Therefore, the criterion in the various defensive forces which I have indicated here is to avoid giving the enemy a free ride with bombers—in the same way that SENTINEL actually avoids giving him a free ride with missiles, even though in the end SENTINEL is unable to stop a Soviet attack, or defend against a Soviet attack. It forces the other side to put some of its payload into penetration aids and so on.

The corresponding thing for air defense is the No. 1 priority—avoid giving them a free ride.

Two, force them to go to air-to-surface missiles, thereby giving up some of their payload. And three, prevent them from making attacks on our land-based missiles with their bombers with impunity—otherwise they would at a low cost be able to knock out most of our land-based missiles, because bomber accuracy is at present better than missile accuracy.

There is one other factor. We must prevent them from flying bombers around and over the United States with impunity. This is one thing that they cannot really do with missiles. They have got missiles, and they sit there. There is no easy way to intimidate us by making them more threatening to us. With bombers, by flying them around our coast-

line, they may make some of our citizens pretty nervous, and with reason.

And finally, I think that air defenses, like missile defenses, will have some damage-limiting capability, but not enough to make any substantial difference in my opinion.

Senator THURMOND. I have about three questions I would like to ask General McConnell.

SOVIET LONG-RANGE BomBER OPERATIONS

General McConnell, on page 5 of your statement you discuss the Soviet long-range bomber refueling. I believe that the Russian publication *Red Star* has reported the occurrence of these refueling exercises. Can you tell us the frequency of bomber refueling exercises by the Soviets over the Atlantic?

General McCONNELL. I had that in the record, Senator—of course, they are doing refueling all the time. But just recently they have come out in the last 3 months in an unprecedented show of force which closely approaches the North American mainland. We have detected the missions in the North Atlantic, and one of those brought a bomber to within 42 miles of Newfoundland.

Senator THURMOND. As Chief of Staff of the Air Force, does this give you some concern?

General McCONNELL. No, sir; not as long as we have capability to intercept them and shoot them down—and not in those small numbers. If they are going to put up large numbers of bombers, and with the present system we have in the continental limits of the United States, we would not be able to cope with them very well. If they put [deleted] heavy bombers over the United States, I believe that the present system lets about [deleted] of them through. That's at low altitude.

Senator THURMOND. The present system would let how many through?

General McCONNELL. About [deleted]—if they come in with proper tactics [deleted].

Senator THURMOND. Well, that's a matter I guess that would cause you concern; would it not?

General McCONNELL. Yes, sir; it is.

Senator STENNIS. Senator Thurmond, I'm sorry but your time is up.

General McCONNELL. If they were to try to come in at high altitude with our present system, then the situation would be entirely different. We would do a very good job of interception.

Senator STENNIS. If it's agreeable to the committee, we will run until 12:30 and then recess, say, until, 2:30.

Senator Cannon.

EFFECTIVENESS OF U.S. AIR DEFENSES

Senator CANNON. Thank you, Mr. Chairman.

General, do I understand your testimony, then, to be that if they ran a mission in with bombers at low altitude, that we would only be able to intercept about [deleted]. I think the testimony before was [deleted].

General McCONNELL. In that neighborhood; yes, sir.

Senator CANNON. Do you subscribe to that?

General McCONNELL. Yes, sir; if they come in at low altitude, with plenty of ECM, and if they also have [deleted] nautical mile missiles on their bombers.

Senator CANNON. Let's give them all capability that they can have. You say if they do this and that. Give them all the capability that they have—with the present ECM capability they have, with the low altitude capability, the refueling capability that they have, with all of the warning and all of the intercept capability, what is your judgment as to the number of bombers they could put over the United States? I am not talking about Canada. I am talking about the United States.

General McCONNELL. A minimum of [deleted] heavy bombers.

Senator CANNON. How far would you think they could penetrate into the United States?

General McCONNELL. I would say about—[deleted].

Senator SYMINGTON. Pick another town please.

General McCONNELL. If they come in that way. [Deleted.]

Senator CANNON. With our BOMARC's would they be useful in that situation?

General McCONNELL. [Deleted.]

Senator CANNON. How much does the BOMARC program cost to maintain?

General McCONNELL. I'm afraid I'll have to furnish that for the record.

Senator CANNON. I would like to have that, Mr. Chairman, because I would move to knock it out, then—if we are maintaining a useless system.

General McCONNELL. It's programmed to go out sometime after [deleted].

(The information follows:)

BOMARC Costs

BOMARC squadrons—Fiscal year 1969 program:

Manpower resources:

Officers -----	96
Airmen -----	1, 104
Civilian -----	56

Dollar costs:

Missile procurement (3020) -----	\$2, 400
Other procurement (3080) -----	1, 200
O&M (3400) -----	3, 616
Military personnel (3500) -----	6, 790

Total -----	14, 006
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LIMITATIONS OF AIR DEFENSE SYSTEM

Senator CANNON. What's the main reason you would give them this great capability of penetration, with the distances they would have to fly, and this tremendous warning system that we have been maintaining over a period of years?

General McCONNELL. The reason is that we don't have any fighter aircraft or any radar system that has a capability of picking up, iden-

tifying, engaging and destroying a low-level aircraft. It has to be done just by going and looking for them, because you cannot see them with the radar, you are out of radar—you are below the radar envelope capability—if he is under around [deleted]. And we do not have a fighter than can—that has a capability in itself to pick him up when he is against the ground clutter, because the radar—even the F-4 radar—has a limited capability to look down and eliminate the ground clutter. That's the reason we want the F-106, so we can put a radar in it that will eliminate the ground clutter.

Senator CANNON. Can't your radars pick them up if they also fly at low level?

General McCONNELL. No, sir.

Senator CANNON. They cannot pick them up if they are——

General McCONNELL. In the ground clutter.

Senator CANNON. The same altitude.

Secretary BROWN. If we fly lower than the incoming bombers, then we can look up. That, of course, greatly reduces the range of our interceptors. They really cannot fly very far under those circumstances. And, of course, Senator, as you know, this is identically the situation that the Soviets find themselves in. We have been spending over a billion dollars a year on our air defense. They have been spending over [deleted] billion a year on their air defense. I am sure that General Nazzaro and General McConnell would say our penetration capability through theirs is still higher—not only [deleted] percent, but [deleted] percent of U.S. bombers could get through. And it is for the same reason.

WHY OUR BOMBERS HAVE SUPERIOR PENETRATION CAPABILITY

Senator CANNON. Why do you give us a greater capability to get through on them than you give them on us?

Secretary BROWN. Our bombers are better and our tactics are better.

General McCONNELL. And I believe we have better ECM.

Senator CANNON. How do you know what their tactics are at low level? Do you suppose they are demonstrating their tactics to you at low level out here where you can see them or doing it over Russia?

General McCONNELL. [Deleted.]

Senator CANNON. [Deleted.]

General McCONNELL. [Deleted.]

Senator CANNON. [Deleted.]

General McCONNELL. No, sir. I just think our bomber force is better than theirs, just because it is a better outfit.

Senator STENNIS. Senator, would you yield at this point for a very brief question?

What do you mean, General, when you say [deleted] would get through? You mean get through to a specific target, like Omaha?

General McCONNELL. Yes. They cannot reach down so far.

Senator STENNIS. I just want to be sure. They would not only invade our territory, but would get through to the target.

General McCONNELL. [Deleted.]

Senator SYMINGTON. Would you yield for a question there?

Senator CANNON. Yes, sir.

PROBLEMS OF LOW ALTITUDE OPERATION OF BOMBERS

Senator SYMINGTON. We know about the buffeting incident to flying a B-58 at low level. We know about problems of trying to fly supersonic at very low levels. We know that might be one of the reasons we are having so much trouble with the F-111A. Why is it, after 20 years of flying bombers at low altitude, we suddenly find out something brand new about all the things we have had for some 20 years.

General McCONNELL. Senator, the B-58, the B-52, and the B-47 were not built for the purpose of flying low. They were highflying fast-weapon systems. The B-58, of course, is supersonic at high altitudes. When you get an aircraft down low, as you know, it takes a much different kind of buffeting than it gets higher up. Higher, you usually get a smooth ride—except on occasion, when you run into clear air turbulence. But when you are down low, it is buffet, buffet, buffet, all the time. And it tears the aircraft up.

Now, I don't think—in my opinion—and I've had some experience with this aircraft, and I have flown it—

Senator SYMINGTON. General, perhaps you miss my point. All the airplanes you are talking about are old airplanes. How did they suddenly get to what you have just said? I will pursue this on my own time.

Senator CANNON. I would like to pursue that. You say they have been flying them high. All right. So they have been flying them high, and we designed our defense toward their high flying. How long ago is it that we changed to a low offense with the B-52?

General McCONNELL. 1957.

Senator CANNON. So it has been 10 years since we have changed. Isn't it reasonable to assume they changed that long ago?

General McCONNELL. I don't believe they did.

Senator CANNON. Why?

General McCONNELL. [Deleted.] Senator, so I cannot answer that question.

Senator CANNON. Well, it would be reasonable to assume they started fairly soon after that, would it not—if we found out we could not get in high, the chances are they are at least half as smart as we are, and that they found out the same sort of thing.

Secretary BROWN. The ranges on most of their aircraft are not as large, Senator Cannon. Of course, it always costs you more range to fly low than high, so they have been more limited on this. I would like to provide whatever I can find for the record [deleted].

(The additional information provided is classified.)

Senator CANNON. But when you talk about a low altitude mission, you don't talk about taking it off from here and flying it low all the way. You take it off and go to high altitude, and you fly, and you refuel, at high altitude, and you would wait until you got a short distance out to penetrate then at low altitude.

Secretary BROWN. We talk about [deleted] penetrations at low altitude, for example.

Senator CANNON. In other words, outside of their fighter interceptor range, probably.

Secretary BROWN. That is correct.

SOVIET BOMBER TACTICS AND CAPABILITIES

Senator CANNON. Isn't that reasonable to assume that they would do the same way?

General McCONNELL. [Deleted.]

Secretary BROWN. [Deleted.]

Senator CANNON. Well, now, when we started the exchange in our tactics to high-low combination, we had to go in with the modifications of the B-52's—do we have any evidence they have carried out any modification programs on their big bombers?

General McCONNELL. [Deleted.]

Senator CANNON. So they do have a good capability.

General McCONNELL. That is what I understand.

Senator CANNON. What is their approximate speed of these airplanes at low altitude?

General McCONNELL. I have got that right here, I think. I had it a minute ago.

Secretary BROWN. The numbers we have are cruise speeds. I don't think we have separate numbers for low altitude.

General McCONNELL. That is correct. But I will give you the cruise speed.

Senator CANNON. The cruise speed of the BEAR?

General McCONNELL. [Deleted.]

Senator CANNON. Roughly, 100 knots—

General McCONNELL. You have to drop [deleted] off for maximum speed at low altitude.

Senator CANNON. That is [deleted]. What is the BISON?

General McCONNELL. The BISON is [deleted]. You would have to drop more than that off because it is a jet aircraft.

Senator SYMINGTON. You say the BEAR [deleted], a four-engine piston airplane, comparable to the B-36?

General McCONNELL. Yes, sir. Those are the performance figures I have. I will be glad to verify that. The BEAR is a four-engine turbo-prop aircraft and is really not comparable to the B-36.

Senator CANNON. And the BISON is [deleted], you say?

General McCONNELL. [Deleted.] It is all jet. So, you would have to drop, I would say [deleted] off at low altitude.

Senator CANNON. It would be maybe a little over [deleted].

General McCONNELL. Yes, sir.

Senator CANNON. What about the BADGER?

General McCONNELL. The BADGER is [deleted]. It's all jet. So, you would have to drop some off of it for low level, says [deleted] off of it. So it would be [deleted].

Senator CANNON. What capability do you have to pick these up on your early warning system?

General McCONNELL. We can pick them up high very readily.

Senator CANNON. I know that. But I don't assume they are going to fly high if they know that you have a good capability high, and that they can get through low. Based on what you think they will do, what do you think their capabilities are?

General McCONNELL. With over-the-horizon radar, we can pick them out a long way out. We have that over-the-horizon radar workable to some extent.

Senator CANNON. Where is that?

General McCONNELL. [Deleted.]

Secretary BROWN. This is a plan rather than an existing system. We are now talking about backscatter radar which we would put in [deleted]. The over-the-horizon radar in now is a forwardscatter radar that operates against missiles. It is not an aircraft detector. [Deleted.]

Senator CANNON. Let me ask you this. Assuming they were to try to put an attack on us next week with aircraft, all they could put over, and they used the tactics that you think you would use against them, where would you be able to pick these airplanes up—based on your present capability?

General McCONNELL. [Deleted.]

Is that about right, Joe?

General NAZZARO. Generally, line of sight.

General McCONNELL. The higher they are, the farther out you can pick them up.

Senator STENNIS. Gentlemen, I am sorry to interrupt—

General McCONNELL. When he gets below [deleted], Senator, it is extremely difficult to see him.

Secretary BROWN. That's why you need the AWACS, and the look-down interceptor.

Senator STENNIS. I hate to interrupt, but I believe I should call on Senator Miller.

Senator MILLER. General McConnell, on page 2 of your statement you say near the bottom of the page, "This capability should be clearly obvious to the enemy." What should we do to make it clearly obvious?

General McCONNELL. Well, I think we have been making it obvious to him, Senator, or else we would not have deterred him.

What I think we should do is continuously improve our system and the development of new systems as they are required, so that he cannot help but know that regardless of what he does, he can be destroyed.

Senator MILLER. Well, that means he has to know something about what we are doing.

General McCONNELL. Yes, sir; that's right. [Deleted.]

Senator MILLER. You are satisfied—that his intelligence is sufficient to enable him—

General McCONNELL. Senator, I am satisfied that he has too much intelligence.

Senator MILLER. All right.

Now on page 4 you talk about [deleted]. What about their ICBM's?

General McCONNELL. [Deleted].

SOVIET STRIKE FORCES INCLUDE BOMBERS AND MISSILES

Senator MILLER. On page 5, when you say the Soviet bomber force is an important part of the Soviet strike force "and in my judgment will continue to be in the future," do you imply by that that they may increase their bomber force?

General McCONNELL. [Deleted.]

I think it is much more likely that they will hang a long-range supersonic air-to-ground missile, say [deleted] on some of their present equipment, which would mean that they would not have to pene-

trate our air defenses before they could launch their missiles. That means we would have to go out and get them.

Let me add another thought, if I may, Senator. Without a proper air defense against bomber aircraft—and suppose that they only have [deleted]—suppose that our air defense does not improve any, and that they should determine that they will use their missiles entirely against our strategic forces and our defense forces. With [deleted] bombers, they could very nearly destroy the population centers of the United States without ever touching them with a missile. So I consider it to be important to us to have a defense against that capability.

Senator MILLER. All right.

SOVIET TACTICAL NUCLEAR CAPABILITY

On page 7 you refer to a formidable tactical nuclear capability of the Soviets in Central Europe. What's the nature of that formidable tactical nuclear capability?

General McCONNELL. They have developed, after we did, nuclear capability to use on their tactical fighter bombers, the same as we developed to use on our tactical fighter bombers.

Senator MILLER. I thought perhaps you were referring to tactical nuclear weapons.

General McCONNELL. Tactical nuclear weapons, that is right. And they have a lot of surface-to-surface missiles, short range, and mobile.

Senator MILLER. Do you have an assessment of that that you could supply for the record?

General McCONNELL. Yes; I would be glad to.

(The information follows:)

The Soviet tactical nuclear capability in the Central European area is evidenced by their nuclear capable aircraft, surface-to-surface missiles, and tactical rockets. [Deleted.] These represent about [deleted] aircraft or over [deleted] percent of the Soviet tactical aircraft deployed in Central Europe.

Organic to Soviet ground forces are the SCUD, a mobile [deleted] surface-to-surface missile, FROG, a mobile Free Rocket Over Ground [deleted] and various tactical rocket systems, [deleted]. Also available in the Central European Theater are the increasingly capable national forces at East Germany, Poland, Czechoslovakia and Hungary. [Deleted.]

This formidable tactical nuclear capability, which has been growing steadily since the early 1960's can be augmented from the same [deleted] aircraft of Soviet Tactical Aviation deployed in the Western USSR and the [deleted] aircraft collocated with units of Tactical Aviation or in reserve. The Soviets could also employ part of their large medium bomber force, [deleted] to deliver nuclear weapons against tactical targets.

[Deleted.]

GENERAL McCONNELL VIEWS ON WHY MUST MAINTAIN NUCLEAR SUPERIORITY

Senator MILLER. On page 8 you say, "They may also view their improved strategic posture as reinforcing deterrence to the point that they could intervene in third areas of the world with reduced risk of U.S. opposition."

On that point, does that imply that where there is a third country involved—that it is in their national interest, or our national interest—that they would feel that they would have a greater concern over a nuclear war than we?

General McCONNELL. I wouldn't say we would have a greater concern over nuclear war than they, although we might very well. I think if they had the superiority, or if they ever get to the point where they have the superiority over us that we had over them in Cuba at the time of Cuba, I think they would be very difficult to get along with.

[Deleted.]

Senator MILLER. When you were talking—when you were referring to this deterrence on page 8, were you referring primarily to a nuclear exchange?

General McCONNELL. I am referring to a nuclear exchange more than anything else; yes.

Senator MILLER. All right.

Now, if you say that we might get into a situation where we would be more concerned than they, I suppose that that would happen if our superiority of nuclear forces was lost.

General McCONNELL. Well, if it was considerably lost; yes.

Senator MILLER. But, if it is not lost, if our superiority is maintained, do you think we might get into that position?

General McCONNELL. I think we should continue to maintain it.

Senator MILLER. I understand. But if our superiority continues to be maintained, do you think we might get into a position where we are more concerned about a nuclear exchange than they are?

General McCONNELL. No; not if it is maintained, and I say it can be maintained.

Senator MILLER. Now, don't you think that there is a possibility there are some people in this country in high places who might be more concerned with a nuclear war than the leaders of the Soviet, even if we have a superiority?

General McCONNELL. Well, I am sure that the national decision-making authorities are certainly concerned with a nuclear war. I cannot say whether they are more concerned than the Soviets or not.

Senator MILLER. Well, do you think that we should—that our leadership in this country should ever be more concerned than the Soviets with respect to a nuclear war than they are if we have superiority?

General McCONNELL. Well, it is difficult to answer a rhetorical question. I think our people should always be concerned about the possibility of a nuclear war to the extent that we should—

Senator MILLER. But that's not my question. My question is not that our leadership should be concerned. I think they should always be concerned. The question is should they be more concerned than the leaders of the Soviet Union if we have a nuclear superiority?

General McCONNELL. Well, I should think that regardless of whether you have a nuclear superiority or not, as long as you have the capability to destroy one another, then I don't see why we should be less concerned than they are, or why they should be less concerned than we are, assuming that they think as much of their country as we do of ours.

Senator MILLER. The point I would like to make is, that I think this: If there is parity, or if there is superiority, and we are more concerned about a nuclear war than they, then we are through—because then we succumb to nuclear blackmail.

General McCONNELL. Well, yes; you could put it that way, but I think with nuclear superiority we could afford to take more chances

than we can take if they have nuclear superiority, or if we have what you call nuclear parity.

Senator MILLER. All right.

DESIRABILITY OF IMPROVING WARHEAD ACCURACY

On page 11—why would it be desirable or necessary for us to improve the CEP down to less than [deleted]. It seems to me that if we have a CEP that we now have that is sufficient—that sufficient damage could be done without worrying about it getting down to less than that.

General McCONNELL. Well, I will let the scientist answer this, the distinguished Secretary of the Air Force. He can tell you in technical language.

Secretary BROWN. For assured destruction, there is not really very much gained, Senator Miller. There is some, because if you are going against a good ABM defense, it helps to be able to put each of your warheads quite accurately on a given place. The principal value for a very accurate ICBM, or very accurate MIRV, is actually in the destruction of hard military targets, which, of course, is connected with damage limitation. And, so, to the extent that we work on very small CEP's, if we do, it is a sign we have not abandoned completely damage limitation as a role of our forces. Going against hard missile silos is very difficult to do unless you have good CEP. That is one of the reasons why damage limiting is so difficult. If one gets to a better CEP, the kill probability against a silo can go from [deleted].

There remains the question of whether that silo will be empty when your missile gets there. That is another reason why damage limiting is not a very easy job.

Senator MILLER. General, on page 17 you refer to [deleted]. Can you elaborate on that a little? I have not heard anything on that.

General McCONNELL. Well, for several years, for at least 15 years that I know of, we have been attempting to develop a [deleted] which would be satisfactory. There has been some R. & D. done on it, but not enough.

Actually, there hasn't been too much of a requirement for it in the past.

Senator STENNIS. Excuse me; are you talking about a [deleted].

General McCONNELL. No; [deleted].

Senator STENNIS. I just wanted the record to be clear.

General McCONNELL. [Deleted.]

Senator STENNIS. Excuse me, gentlemen. We want to extend to Senator Curtis the courtesy of asking some questions.

Senator CURTIS. Mr. Chairman, you are going to quit at 12:30. It's a little after that now. I think I should go to the foot of the class. I am not a member of the committee. I do have several questions.

Senator STENNIS. All right. Come back this afternoon if you can.

Senator MILLER. Mr. Chairman, I think—the Secretary wanted to elaborate on this.

Secretary BROWN. I can do that this afternoon.

Senator STENNIS. You can do it now if you wish.

Secretary BROWN. I think I should say, Senator Miller, that [deleted] are a difficult task. [Deleted.]

Senator MILLER. Do we have an R. & D. program on that?

Secretary BROWN. Yes; but it's in very preliminary form.

General McCONNELL. We have worked on that for the last 15 years to my personal knowledge, that I have been associated with it, and we have not come up with one yet. But at least we are 10 times closer to it now than we were then.

Senator MILLER. Thank you very much.

Senator STENNIS. All right, gentlemen. I think we have had a good session. We will take a recess now until 2:30.

(Whereupon, at 12:35 p.m., a recess was taken until 2:30 p.m., the same day.)

AFTERNOON SESSION

Senator STENNIS (presiding). We had questions by members of the committee this morning, due to the special situation.

I like to give the staff a chance early in each segment of the hearings to ask such major questions as they might wish. I am going to call on Mr. Kendall now, who will move right in on these problems.

FEASIBILITY OF DAMAGE-LIMITING STRATEGY

Mr. KENDALL. Thank you, Mr. Chairman.

General McConnell, one of our witnesses last week told us that our basic national policy is to maintain the assured destruction mission, and that damage limiting is not a feasible strategy. It was also made clear that in procuring and deploying forces, the primary consideration is the assured destruction concept. Do you agree with this concept of our national policy, and is any other concept feasible?

General McCONNELL. Well, I would answer that question, Mr. Kendall—you can always, shall I say, be capable of assured destruction because the places you are going to destroy are there, and even though they are heavily defended, they do not move, and you can go in and get them.

Mr. KENDALL. [Deleted.]

General McCONNELL. I believe that we should continue to do as much as we can in terms of damage limiting. It depends on the scenario of how the war starts and how it progresses as to how much damage limiting we can actually achieve.

I do not believe we should give up the damage limiting part of the scenario, and we should continue to apply all that we can against the damage limiting targets while at the same time, shall I say, guarantee our assured destruction capability.

Mr. KENDALL. But, as I understand the national policy generally, in large measure we justify the procurement of a weapon system only on its assured destruction capability with the damage-limiting aspect as sort of a fallout.

For example, Dr. Enthoven said he did not believe we should invest large amounts of additional resources to procure the capability to perform the other three strategic nuclear missions—that is limited and controlled retaliation, damage limiting, and preemptive strike.

Do you agree with this concept? I do not know that any other concept is feasible—whether we can get a serious damage limiting posture. As a man in a military situation, do you agree with that concept?

DAMAGE LIMITING IS AN IMPORTANT COROLLARY TO ASSURED DESTRUCTION

General McCONNELL. Not when they have the forces that are—shall I go back a few years? A few years ago we certainly could have done a very good job in damage limiting, because they had soft targets. Most of their missiles were soft. They did not have too many. We had a preponderance of power. We could have done a considerable amount of damage limiting.

Now, with the hard targets they have, which can give us the most problems, and with the warning capability, I agree that it is not appropriate to expend inordinately large sums for the purpose of damage limiting strategy. But, I do believe that we should have some damage limiting capability which always grows out of the capability for assured destruction.

I will give you an example. If they were to shoot all their missiles at us—I think I am right on this—they have about [deleted] percent of them on the alert. They have about [deleted] of them that will go dead in the hole. I believe that is the right number that will be dead in the hole and that will not go out at the time they are supposed to come out.

Now, of course we do not know where the [deleted] are. But we would be foolish not to target all the missiles that we could target in order to save just that [deleted]—if we could kill them. I get to that damage limiting thing. Also, if we did not bomb their airfields, they would be capable of going back and landing and executing a restrike against us. We would like to get their airfields out of the way. We ought to knock out their subpens, and their ports, and targets of that nature, which support their warmaking capability as well as their industrial base and urban areas.

I do not think we should give up on damage limiting. It should be a corollary. But I do not believe under any circumstances that we should just take our forces and say, "All we need to do now is to be certain that we can destroy 50 percent of their urban industrial complex and 25 percent of their people," without paying any attention to their weapon systems.

Mr. KENDALL. Then you believe we should buy forces for damage limiting.

General McCONNELL. I believe we should buy some forces for damage limiting.

Mr. KENDALL. As you mentioned this morning, in the Cuban missile crisis of 1962, we had a superiority in nuclear weapons, and I think we all agree that is one of the reasons the Soviets backed down.

General McCONNELL. Well, let me also say we had a very exploitable superiority in tactical weapons. We could nearly sink the State of Florida with the tactical aircraft down there.

Mr. KENDALL. Yes; but we no longer have the exploitable superiority in nuclear weapons, and apparently will not have it in the future. How would this affect us in any future Cuban-type confrontation? Would it not weaken our bargaining position, or the force of our bargaining position?

General McCONNELL. Let us take this Cuban-type of situation all over again.

[Deleted.]

Mr. KENDALL. Well, in view of their drawing even—or approaching parity, at least—in the number of missiles, do you have any reason to think that we are getting into or headed for a condition of unconditional mutual deterrence, whereby neither side would ever be able to release its nuclear forces against the homeland of the other without committing national suicide?

General McCONNELL. I do not see any way out of that position at the present time. I think that regardless of whether we are as close together as we are now, or if we get farther ahead of them—which I think is absolutely essential for matters of policy and prestige in the world, and to keep other people on our side, rather than letting them go over to their side—until such time as there is a defense against missiles, which I do not foresee—which is capable of keeping enough of them off your country, to the extent that you can accept the damage, then in my opinion it will be a mutual exchange which will be devastating to both sides.

Mr. KENDALL. And that—

General McCONNELL. It is up to us to be sure that when it is over we come out a little better than they do.

Mr. KENDALL. On page 2 of your statement you said that U.S. forces must possess a “clear margin of safety,” and on page 3 you say, “Our forces must have an assured capability.”

How do you equate those terms with the term “superiority?” Are you referring to a condition which could be less than superiority, such as parity, or even less than parity?

General McCONNELL. No, I never intended, by connotation or otherwise, to indicate that I would be satisfied with anything less than superiority, and a recognizable superiority.

Mr. KENDALL. The reason I ask is that Dr. Foster used the term “margin of safety” when he testified, and, when asked about it, Dr. Enthoven said that nuclear superiority was not important in itself as long as we had this margin of safety and thereby retained an assured destruction capability. I take it that you do not agree with that.

General McCONNELL. I think that we should always maintain a definite and well-recognized superiority.

Mr. KENDALL. General Nazzaro, we have been told that there [deleted], is that correct?

General NAZZARO. That was correct, sir. [Deleted.]

Mr. KENDALL. Is it still true [deleted].

General NAZZARO. It is still true.

Mr. KENDALL. What is the reason for that, sir?

General NAZZARO. [Deleted.]

Mr. KENDALL. Well, according to all estimates, and the information you gentlemen gave us this morning, the Soviet ICBM force is going to continue to grow in numbers. [Deleted.] Would this be a correct conclusion?

General NAZZARO. This would be a correct conclusion.

GENERAL NAZZARO ASSESSES U.S. DAMAGE LIMITING CAPABILITY

Mr. KENDALL. What would be the result of this trend if it continued for some time? Would it affect or impair either our damage limiting or our assured destruction capability?

General NAZZARO. Well, I think the assured destruction capability—if we stay ahead in the number of weapons to apply against them to both suppress their defenses to enable us to get through—we will be able to do the assured destruction. What we can do damage limiting—wise would be based upon what they have as an offensive threat and of what we have to apply against that threat.

Mr. KENDALL. And, as their force increases, what we have left is going to be relatively less.

General NAZZARO. Unless we take some steps to improve our position.

Mr. KENDALL. Does this indicate a need for more missiles, more bombers, or more hard target killers in our inventory? What does it indicate?

General NAZZARO. Well, to carry out the policies which I am guided by in laying out the application of these weapons, it would take more forces to do both the assured destruction and the damage limiting attacks.

Mr. KENDALL. As I understand it, some [deleted] odd nuclear weapons are targeted against Soviet nuclear threat targets; is that right?

General NAZZARO. I do not have the specific number. I think General McConnell gave you a fair estimate, [deleted] percent of our effort really is applied against the assured destruction task, the remainder against damage limiting and suppressing defenses in order to guarantee we can carry out the assured destruction task.

Mr. KENDALL. Well, presumably if the Soviets struck first, many of the nuclear threat targets would no longer be targets of value. What are our capabilities to retarget after riding out an all-out Soviet first strike?

General NAZZARO. We have capabilities to retarget. We also have what we call the option to flip our weapons, primarily our missiles, from one category of targets to another, [deleted].

Mr. KENDALL. But that capability is rather elemental at this time; is it not? Do we not plan some improvement in that? Would we not have some real problems retargeting in the confusion that would follow a nuclear exchange?

General NAZZARO. No, sir. We have on the MINUTEMAN I—we have a capability to store [deleted] in the MINUTEMAN I-B. In the MINUTEMAN I-A, of which we have very few left, about [deleted] missiles, we have the capability to store [deleted]. In the MINUTEMAN II, we can store [deleted] and select any one of those targets. In the MINUTEMAN III, it will have a comparable targeting capability.

So, today in the MINUTEMAN II force, we have the capability of applying that missile against [deleted] possible targets.

Mr. KENDALL. I was looking at it from the other side of the coin. We lack the capability to know actually which would be empty holes and which should be retargeted. That is what I had in mind.

General NAZZARO. I did not mean it that way.

Mr. KENDALL. I understand.

General NAZZARO. We have no way today of telling what is an empty hole. [Deleted], we applied some against all the silos on the basis that, first, as intelligence indicates, they keep about [deleted] percent on alert. They have a [deleted] percent abort rate. We do not know what

their philosophy is as to whether they would withhold missiles to fire subsequently. So what is left in the silos is unknown, except for the abort rate, if the intelligence estimates are correct. [Deleted.]

Mr. KENDALL. Dr. Brown, did you say something?

Secretary BROWN. [Deleted.]

Flexibility is required to go from a damage limiting role to an assured destruction role, depending upon how much and where we are struck. As General Nazzaro says, we have that capability now, that is built into the plan, so that should the Soviets launch a heavy strike at the U.S. cities and nuclear capability, and should the national command authority make the decision, our retaliatory strike can be directed principally at urban industrial population targets, thereby greatly increasing the force that would be applied on those.

SECRETARY OF AIR FORCE RECOMMENDATIONS ON AMSA

Mr. KENDALL. Mr. Secretary, you made an argument which sounded very strong to me in favor of an AMSA, but you did not come down flatfooted on it.

What have you recommended with respect to proceeding with the AMSA?

Secretary BROWN. My specific recommendation in terms of preparation of the fiscal year 1969 program was for contract definition which would reduce the time to operational capability by 1 year. I think Dr. Foster mentioned that he is now looking at whether there are other ways to reduce that time, and if we can find some, I would be all for that. But my specific recommendation was for contract definition.

The arguments I gave for AMSA are strong arguments, given the assumptions that are made in those arguments—that is, the assumption of a large Soviet military threat, missile and bomber, and most of all defensive threat.

Mr. KENDALL. Well, you said on page 2 that if Soviet forces continue to increase, “I believe that we will wish to undertake full-scale development.”

Secretary BROWN. That is right.

Mr. KENDALL. Well, the NIE projects that Soviet forces are going to increase. I do not know of anybody who dissents from that. Does this not mean it is really your opinion we should proceed forthwith with the AMSA and the updating of our missiles?

Secretary BROWN. I think we should proceed. I think the rate depends upon the rate which you think the Soviet threat is going to increase. I think you have to look at specific numbers. I tried to do that in my statement, you will recall, and pointed out that if one desires to maintain a substantial bomber penetration capability, there are various ways that you can do it—even in the face of a continuing increase in Soviet defensive and offensive threat.

The first thing you can do is put in penetration aids. I think we will want to do that anyway. Beyond that, at some point a new bomber becomes the most effective way to do it. I think I have shown where that point is. Anyone can make his own judgment as to when one should start a new bomber. I made my recommendation. I think it is a matter of judgment when you proceed. I am uneasy with the fact

that it takes so long to make a new bomber, and I think we ought to reduce the time to an operational capability.

AMSA CONTRACT DEFINITION SUPPORTED BY JCS BUT DISAPPROVED BY
SECRETARY OF DEFENSE

Mr. KENDALL. I believe the Joint Chiefs supported the Air Force in their position for fiscal year 1969.

General McCONNELL. That is correct.

Mr. KENDALL. The Secretary of Defense disapproved the recommendation that you go to contract definition.

Secretary BROWN. Yes; the Secretary of Defense disapproved, and the budget does not contain the money for contract definition.

Senator STENNIS. We have all that in the other record. We are going to cross-reference this record with the record in the authorization hearings.

Secretary BROWN. I think the reason for the Secretary of Defense's decision was made clear in his statement. He just does not see the threat as being that urgent.

General SYMINGTON. Made clear to you.

Secretary BROWN. They were presented to the committee as well.

Senator STENNIS. All right.

Mr. KENDALL. There has been previous testimony, Mr. Secretary, that the Air Force has never submitted to the Secretary of Defense complete plans for the AMSA—that is, with the specifications detailed and outlined. Is that true? If so, how could the Air Force recommend at this time that we go to contract definition?

Secretary BROWN. The Air Force has submitted as long ago as November 7, 1966, a request to proceed with contract definition for AMSA, and a description of AMSA which I would like to include in the record, but I can summarize it here. I have it right in front of me. It said [deleted]. The range is given for a total profile [deleted].

The number of SRAM's that could be loaded on the aircraft. That kind of detail is given. I would be glad to put it in the record. You will have to judge for yourself whether that is a specific detail of characteristics. My judgment is that it is.

(The information follows:)

The following is quoted from a Memorandum for the Secretary of Defense from the Secretary of the Air Force, dated November 7, 1966:

"Specifically, I propose that we establish firm costs and schedules associated with the acquisition of an advanced supersonic bomber in the [deleted] pound gross weight class. This proposal will require \$25 million in FY 68 funds."

Attached hereto is Appendix D of a Summary Report of the Concept Formulation Studies for the Advanced Manned Strategic Aircraft prepared in October 1966 and forwarded to the Secretary of Defense by the Secretary of the Air Force on November 7, 1966.

("Appendix D" was furnished but is deleted for security reasons.)

LIMITATIONS ON INTELLIGENCE LEADTIME

Mr. KENDALL. Mr. Secretary, it may very well be — and this is what we are basing our policy on to some extent—that the Soviets could not bring a new weapons system to operational status without our knowing about it. But certainly they can do a lot in research and de-

velopment and might be well downstream toward a system before we first know about it; for example, do we really know what they are doing today and have done in research and development on such things as MIRV, improved accuracy, warhead hardening, penetration aids, improved air defense and so forth?

Secretary BROWN. The answer is different to each one of those, Mr. Kendall. [Deleted.]

This gives us at least an earliest limit to the time at which they could have something.

It would take, as I think was testified before, [deleted].

The same goes for penetration aids, which are missile—missile penetration aids, those are of less immediate importance to us, because we are not putting up a defensive system against Soviet ballistic missiles in the present program.

With respect to improved air defense systems, we have seen improved interceptors on their part. [Deleted.] We have not seen any evidence of [deleted] so we are postulating what they might have.

Again, what we can do is set a minimum time before they can have something, based on what we have seen, [deleted].

Now, I am concerned about the limitations on our intelligence lead-time. I am in favor of all kinds of improved intelligence acquisition capability, situation capability, in order to improve that situation. But I think we must keep in mind that against so balanced a force, and such a large force, and varied force, as we have—land-based missiles sea-based missiles, bombers, and all kinds of warning systems—no single Soviet unexpected action or capability is going to upset that.

In other words, it takes a long time from decision to development to deployment—even for them.

In the second place, no single development and no single deployment is going to put at risk all of our forces. This does not remove my concern, but I think it sets it in perspective, and it is something I think we should all remember.

Mr. KENDALL. The basic point I am making is that we do not have any assurance that we would know about these things until the first test flight, or some physical occurrence of that nature, and that the lead-time from the first test flight to deployment is much shorter than the time from commencement of research and development to deployment.

Secretary BROWN. That is right.

Mr. KENDALL. Thank you, sir.

U.S. NEEDS BOTH OFFENSIVE AND DEFENSIVE CAPABILITIES

Senator STENNIS. All right. We will switch over now to the Senators.

I want to ask the General one question now. This is rather general, but I can assess the situation better, General, by getting your response to this.

After all is said and done about these defenses and warning systems, why not just keep up our potential offensive power to the extent that we have a great margin there, and maintain the ability to hit and destroy to the extent necessary. Why not just concentrate on that, and let the other go?

General McCONNELL. And have no defense at all?

Senator STENNIS. Why not adopt the offensive thrust as the best defense?

General McCONNELL. If we could not afford, Mr. Chairman, anything except an offensive capability, I would say we would be much better off to have an overwhelming offensive capability. However, I think we should certainly be derelict in our responsibility to the American people if we did not provide them with some kind of a defense against Soviet attacks against this country.

Senator STENNIS. You are not talking about civil defense now.

General McCONNELL. I am talking about military defense, both passive and active. And I just cannot see, for example, the air defense system continue to deteriorate. As I said this morning, he could use all of his missiles against our forces, and then he could leisurely and at will take his [deleted] bombers, if that is all he has, and destroy completely the population of all of our major cities. He could do this even with just those bombers without some sort of a defense. And I do not think that is proper. I think we have to have a defense that can protect our people from wanton destruction.

Senator STENNIS. So you are emphasizing the defense of our cities—

General McCONNELL. I am not emphasizing it over the offense.

Senator STENNIS. I know that. But you are giving an emphasis to the defense of cities for considerations not primarily military but saving civilian lives.

General McCONNELL. Yes, sir; and also to protect our military capability. I would not—

Senator STENNIS. I was going to come to that.

General McCONNELL. I would not care for them to be able to bring bombers in against the missile sites and bomb them at will with high accuracy and large yield weapons, higher than you can put onto a missile, and destroy [deleted] percent of them.

Senator STENNIS. All right.

Moving on from the population, as the next category, you feel that we need protection for our military potential and for our military offense?

General McCONNELL. Yes, sir.

Senator STENNIS. And also to protect our industrial resources, to a degree.

General McCONNELL. Yes, sir.

Senator STENNIS. Because that supports our capacity to have an offense.

General McCONNELL. Yes, sir.

SENATOR STENNIS EXAMINES RELATIONSHIP OF OFFENSE AND DEFENSE

Senator STENNIS. What is your answer to the proposition, though, that with just an ordinary warning system, if they should start on a mission using their bombers, what would our missiles be doing in the meantime? Should we not destroy them, industrially and militarily and populationwise to a percent, within a few minutes?

General McCONNELL. We could. That would be up to the national decisionmaking authorities, specifically to the President and his ad-

visers, as to when we would release them—the missiles. They can be released like that!

Secretary BROWN. But, Mr. Chairman—

Senator STENNIS. Pardon me, just a moment. I am not necessarily taking that position, but I want to see what the general's reaction to it is.

If we determine on a policy which relies on a powerful offense as being the best defense, we certainly would have thereby determined a policy to strike with the indication that we would be struck. What do you say to that?

General McCONNELL. The way I understand you, Mr. Chairman, is that we said, "All right, we will put everything on offense. Therefore, if he strikes, the only thing we have to do is, we have to strike back."

Senator STENNIS. Haven't we already decided that?

General McCONNELL. We have decided we are going to strike back. I think that is a poor position to be in.

Senator STENNIS. You think that is an inadequate position?

General McCONNELL. I think it is; yes. Suppose he puts two missiles down on you. Are you going to strike back at that? What level of damage are the national decision authorities, whoever they might be at that time, prepared to take before they do that? I think we ought to have a capability to protect ourselves, as well as to destroy him.

Senator STENNIS. Do you think we would be taking too great a chance depending solely on offensive power?

General McCONNELL. Yes, sir; I believe we ought to have a substantial superiority in offensive power. But I cannot bring myself to believe that we should neglect the defense of our country.

Secretary BROWN. I think, Mr. Chairman, even if one decided one was not going to defend the population of the United States, and was only going to rely on assured destruction, one would want enough defense of our assured destruction capability, as the General said, so we would not have to use it right away. Suppose they started coming over with bombers and hitting our missiles, and not destroying any of our population. I think any national decisionmaking authority would want to have other options than having to go after their population, before they had gone after ours, for fear that if he waited, all of our offensive capability would be destroyed.

Senator STENNIS. Well, I think there is a lot in what you gentlemen say.

All right. I think you have stated it well and brought out the points I had in mind.

Senator Thurmond, that brings it to you, sir.

COMPOSITION OF U.S. MISSILE FORCES

Senator THURMOND. Thank you, Mr. Chairman.

General McConnell, on page 9 and page 10 you discuss the number of ICBM's. How many ICBM's are planned for 1975?

General McCONNELL. Actually, in the program, there are no more than 1,054 ICBM's planned. The total number of warheads, though, goes up considerably by MIRVing the MINUTEMAN III. And we could, by that time also, if we take action now to go into development,

have either a substitute for the MINUTEMAN III in [deleted] which would indicate you could put more MIRV's on it, or you could have that in addition to the MINUTEMAN II and III.

The number of missiles presently programed does not go up, but the number of warheads goes up considerably.

Senator THURMOND. The number of missiles will not go up, but the number of warheads will?

General McCONNELL. Yes, sir; because you can put [deleted] warheads on one missile.

Senator THURMOND. In other words, the one missile would carry multiple warheads.

General McCONNELL. Yes; and POSEIDON, of course, also does that.

Senator THURMOND. What progress have we made in the decoys? Would you send any decoys with those?

General McCONNELL. You could have latitude to do either one. If you were going to send decoys, you would send a smaller number of warheads.

Senator THURMOND. Do you think it would be advantageous to send decoys, or another warhead?

General McCONNELL. I think you mix them up. Decoys, chaff, and warhead. We have a chaff capability right now which has actually been demonstrated as being pretty good [deleted].

Senator THURMOND. You gave, I believe, certain numbers there of the MINUTEMAN. Did you answer specifically the breakdown in terms of MINUTEMAN II and MINUTEMAN III?

General McCONNELL. I did not give that breakdown. I have a program of that. It is complicated. I could submit it.

Senator THURMOND. Just put it in the record, that will be all right. (The information referred to was classified and is deleted.)

Senator THURMOND. [Deleted.] Can you evaluate this development?

General McCONNELL. No, sir; I had not had any information to the effect that they are doing that [deleted] although it is not inconceivable. Could I furnish that for the record?

Senator THURMOND. I wish you would. I think that is well worth looking into, too.

General McCONNELL. I agree with you, Senator.

(The information referred to follows:)

The BEAR-D, a reconnaissance variant of the BEAR Bomber, is assigned only to Soviet Naval Aviation. [Deleted.]

Senator THURMOND. I had a couple of questions here for General Nazzaro.

General Nazzaro, we know that the Soviets have equipped their long range bombers with air to surface missiles as standoff weapons to circumvent our defenses.

What is your evaluation of this capability, and what would be the comparison of the Soviet capability with that of the United States?

General NAZZARO. Frankly, I have not evaluated their capability in terms of what they can do against the United States. I have evaluated our capability in terms of what we can do against Russia.

We use our air-to-surface missile to suppress defenses, to open corridors for us, to hit soft targets—wherever we can maximize it to

make the entry of follow-on aircraft easier and to permit them to cover more targets.

What tactics they apply in utilization of their air to surface missile I have not war-gamed, since this is a different area of activity, such as the defense of the United States.

OUR DAMAGE LIMITING CAPABILITY IS DECLINING

Senator THURMOND. Now, on page 25 of your statement, you express concern over our ability to engage the Soviets in the future.

General NAZZARO. Yes, sir.

Senator THURMOND. The question is, What do you think is needed?

General NAZZARO. I explained that this morning, Senator Thurmond. By that, I mean that although we can do the assured destruction task, the damage limiting one is the one that I have doubt as time goes on.

Senator STENNIS. Pardon me. What was that you said, General?

General NAZZARO. I explained when I read the blue lined version this morning what I mean by that phrase, and I said by this I mean that although the assured destruction task can be done, our damage limiting capability is steadily decreasing.

Senator THURMOND. Do you feel we are getting the full intelligence that is adequate in order for us to prepare the countercapabilities that you referred to?

General NAZZARO. I cannot respond to the question, are we getting the full intelligence. I do think sometimes we get intelligence long after we need it.

[Deleted.]

Senator THURMOND. I am sure you agree that we must retain a superiority over the Soviets.

General NAZZARO. No question about it, sir.

Senator THURMOND. There is no question in your mind that their goal is the same, that is, to dominate the world—is that right?

CINCSAC RECOMMENDATIONS FOR MAINTAINING U.S. SUPERIORITY

General NAZZARO. Yes.

Senator THURMOND. In view of that, what would you do if you had the power, if you had the authority to make the decision—what would you do today that we are not doing or have not done in order to maintain that superiority?

General NAZZARO. There are two concerns I have. One is the lateness with which we get intelligence on their offensive forces, and it applies also to their defensive forces. That is one.

Second, the time it takes to develop a weapons system we may need should our intelligence be wrong.

An example—it is my understanding, if you go to contract definition for the AMSA today, you don't get it until 8 years later. Now, if this time can be compressed a great deal, we may have, in my opinion, more reason to say we can exercise an option. But if our intelligence is inaccurate, then the long development time does not favor always having options.

Senator THURMOND. Well, what do you recommend be done to accomplish the suggestions you have made?

General NAZZARO. In my recommendation to the Joint Chiefs, when they asked me for what force requirements I thought we needed, I requested the retention of the B-52 C through F's, and additional FB-111's.

Senator SYMINGTON. The retention of what?

General NAZZARO. The B-52 C through F, and additional FB-111's.

In fairness, I should explain all the unified or specified commanders are asked for what they think the force requirements are. Then the JCS themselves have to pit what I suggest, what CINCLANT suggests, what CINCPAC suggests, and merge the POLARIS requirements, the aircraft requirements, the FB-111 requirements, missile requirements.

Whether I am supported on that or not, I cannot respond at the moment. This is for the next budget.

I have also requested that we modify the B-52 C through F fleet, because at the rate that we are operating in Southeast Asia, the B-52D's start losing their service life at the current rate beginning in [deleted] and they fall rather quickly.

SAC DEPENDING ON FB-111

Senator THURMOND. If the FB-111 proves unsatisfactory and the program has to be dropped from the Air Force as it was from the Navy—what do we have that can step in to fill that gap?

General NAZZARO. Well, I hope the FB-111 does not fail. We are depending on it. We think it is going to be good.

In the event something should dictate that the FB-111 is not available to us, we would hope to have the C through F fleet modified to a great extent—

Senator THURMOND. Have what modified?

General NAZZARO. B-52 C, D, E, and F, modified to a great extent to carry out the job we think they should. It would mean wing modification, it would mean all the electronic countermeasure equipment we need, it would mean fuselage modification. In other words, we would have to update them quite a bit. And if I had the choice today, I would take the FB-111 over the C through F fleet.

Senator STENNIS. Over what?

General NAZZARO. The FB-111 in preference to the C's D's, E's, and F's.

Senator THURMOND. Now, what would be the comparative speed of the two?

General NAZZARO. Well, the B-52's fly the same [deleted] level, and the same speed as the G's and H's. With the FB-111 we have a bit more flexibility. We have exercised various profiles. You can go from [deleted] if you have to, at high altitude, to [deleted] at low altitude. We have exercised them with penetration at [deleted] and at [deleted]—all of which are higher than the B-52 C through F fleet.

Senator THURMOND. Well, if you modified the B-52, you still would have a comparatively slow plane, would you not?

General NAZZARO. Slower than the FB-111; yes, sir.

Senator THURMOND. What would be the speed if you modified them, did you say?

General NAZZARO. It would not change the speed any. It would still be, I think, [deleted] at low altitude, and about—the way we are operating them today—[deleted] at high altitude.

Senator THURMOND. And you suggest we just build more of that kind of plane?

General NAZZARO. No, sir, I am not suggesting we build more of the C's or F's.

Senator THURMOND. Isn't that a slow plane today?

General NAZZARO. Yes, sir. I interpreted your question, Senator Thurmond, as I understood it, to mean if I did not get the FB-111 in today's environment, what could I do. And I responded that I would ask for the maximum modifications for the older B-52's that are scheduled to be retired from the inventory.

AIR FORCE SATISFIED WITH FB-111 TO REPLACE OLDER B-52'S

Senator THURMOND. What is the Air Force coming up with in the way of some other plane?

General McCONNELL. I could answer that question, sir. We have asked for contract definition for the advanced manned strategic aircraft, which would take the place of the B-52G through H. That aircraft could not be available to us until 1975 or 1976, unless there is some way of cutting down the long lead time, which Secretary Brown referred to.

Meanwhile, the FB-111 is the only available new piece of equipment. My personal opinion is that it is a satisfactory piece of equipment to take the place of the older series of B-52's—that is the C through F. We are due to have 14 squadrons of those—on the basis of two FB-111's to three of the old B-52's.

Senator STENNIS. Pardon me, Senator, would you yield right there?

You say you are satisfied that this FB-111—

General McCONNELL. Yes, sir.

Senator STENNIS (continuing). Is a satisfactory—

General McCONNELL. I am satisfied that it will give use satisfactory performance as a bomber, to take the place of the older B-52's.

AMSA COULD NOT BE OPERATIONAL BEFORE 1975

Senator STENNIS. What can be done to cut down on the leadtime for AMSA? You said if it could be.

General McCONNELL. Could I refer that to Secretary Brown, please?

Secretary BROWN. I think it would be very hard to produce an AMSA, operational, before 1975. You can go to a crash program. But those crash programs that might save you a year or two always run the costs way up, and then you have to come back and fix things later. So I don't really think that we can get it before 1975.

Senator STENNIS. All right. You have answered it.

Go ahead, Senator.

Senator THURMOND. You say that would be 1975?

Secretary BROWN. Yes, sir—7 years from now.

Senator THURMOND. That is 7 years.

Secretary BROWN. Yes, sir.

Senator THURMOND. Well, if we have a crisis with the Soviets, we will need planes in much shorter time than that. If it really came to

downright survival, you could get them quicker than that, couldn't you?

Secretary BROWN. We have 600 bombers right now, which we think can penetrate, Senator Thurmond.

Senator THURMOND. What are they?

Secretary BROWN. The B-52's, B-58's, and the FB-111's that are coming in.

Senator THURMOND. The B-52's are mighty slow.

Senator STENNIS. Senator, excuse me. Your time is up.

Senator CURTIS. Mr. Chairman, could I submit some questions in writing?

I will just hand them in.

(The questions referred to follow:)

Senator CURTIS. General McConnell, I want to ask you some questions about the planned phaseout of our high yield nuclear weapons from the strategic inventory. At the present time, as I understand it, SAC has in its weapons inventory a large number of [deleted] yield nuclear warheads. These can be carried by the 54 TITAN II missiles, the 600 B-52's, and the 80 B-58's but by no other of our delivery vehicles. Is this substantially correct?

Approximately how many of these [deleted] weapons are in the strategic inventory now, and also approximately how many are targeted for the first strike?

Now it is my understanding that the actual targeting of weapons is a purely military matter, done by the JSTPS at SAC Headquarters in Omaha. The fact that so many of these high yield weapons are actually targeted would indicate to me that the military men feel they are a useful part of our arsenal. Could you explain to me why they are being phased out from our bomber force?

Do you personally think this is a wise course of action?

Are we not losing our capability to destroy hard targets when we take these weapons out of the bomber force?

Do you personally think this is a wise course of action?

Are we not losing our capability to destroy hard targets when we take these weapons out of the bomber force?

(The answers referred to were classified and are deleted.)

Senator STENNIS. All right.

If you will excuse us now, there is a vote on the floor.

(Brief recess.)

Senator STENNIS. The committee will come to order, please.

Senator, I believe your time had just run out.

Senator Miller?

TACTICAL NUCLEAR WEAPONS—DANGER OF ESCALATION

Senator MILLER. Thank you.

Now, Mr. Secretary, I have been puzzling over your statment at the bottom of page 4, where you reiterate that an all-out thermonuclear war would be so catastrophic for both sides that the threat cannot be used with any confidence to deter action less than the use of nuclear weapons on the U.S. or its NATO allies.

That seems to me to imply if there is going to be deterrence, it is going to have to be—that is short of all-out nuclear war—it is going to have to be in the area of limited nuclear war or conventional war. Tactical nuclear weapon war, for example.

Do I read this correctly?

Secretary BROWN. I had in mind principally, Senator Miller, the requirement for large scale conventional forces to deter conventional

actions. Tactical nuclear weapons are one additional form of deterrence possible against massive conventional attack. But most people who have thought about it believe that the use of tactical nuclear weapons greatly increases the probability of escalation to an all-out thermonuclear war, and to the extent that is true, their use becomes somewhat less credible also; and one is forced back to conventional forces as a deterrent against conventional operations.

Senator MILLER. I have never been able to quite see the logic—the compelling logic to the tactical nuclear weapon exchange being followed probably by an all-out nuclear war.

Do you subscribe to that theory?

Secretary BROWN. I think that the prediction of what is likely to happen is so difficult that one can't use tactical nuclear weapons and be even reasonably sure they won't escalate to all-out thermonuclear war. And I think that the reason is that these weapons are more effective on airfields and industry than on troops. The tendency will be for each side to try to preempt with its tactical nuclear weapons, use larger and larger ones, and this in Europe, at least, would cause so many collateral civilian casualties, that in very short order it would be difficult to distinguish the conflict from a strategic nuclear war.

Senator MILLER. Well, if it worked out that way. But I just don't follow the compelling logic that if there is a massive use of conventional forces, which one side cannot match, except for maybe a 30- or 60-day period, why the use of tactical nuclear weapons on the battlefield to offset the conventional force advantage would mean that we would end up with the use of tactical nuclear weapons on targets which would result in the civilian casualties; and, therefore, impel us into an all-out nuclear war.

Secretary BROWN. I think we might be forced to use tactical nuclear weapons if the conventional forces were unable to achieve some kind of balance.

I can only say that in all the war games that I have seen, many done by Europeans who were trying to show that tactical nuclear weapons can be used on the battlefield, the estimated civilian casualties that they find are such that it is hard to tell the conflict from strategic nuclear war, at least in Europe.

Senator MILLER. Then if it is so difficult there, why are we quibbling about whether we are going to have an option remaining if there are full-scale nuclear weapons against us, an option to see whether or not we want to retaliate with five or 10 or with all of them?

Secretary BROWN. Because, although it is difficult, it may not be impossible. Should a strategic nuclear war begin, I don't think that we want to limit ourselves so that we can only retaliate massively and against civilian targets.

Senator MILLER. Well, if that is so, then what you are really saying in this statement is that you could deter actions less than massive use of nuclear weapons in the conventional area, to a lesser extent in the tactical nuclear weapon area, and to a lesser extent but to a sufficient extent to want to have the option in the case of limited regular nuclear weapons.

Is that about it?

Secretary BROWN. I think that there is some chance that nuclear deterrence may be applied at the conventional level, but I don't think

it can be applied with any confidence. I don't think you can deter in Europe, for example, a conventional probe, with conventional weapons, by the threat of all-out nuclear war. I think the other side won't believe us.

Senator MILLER. I understand that. But—I infer, then, that since that is the one you are blacking out from consideration—

Secretary BROWN. Right.

NUCLEAR WEAPONS DETER MASSIVE CONVENTIONAL ATTACK ON EUROPE

Senator MILLER. That you are not blacking out the deterrent possibilities from a limited use of regular nuclear weapons.

Secretary BROWN. I think that—

Senator MILLER. You say you want the option.

Secretary BROWN. Right, right. I think that having nuclear weapons—and, of course, we have 7,000 of them in Europe—does to some degree deter the Soviets from a massive conventional attack, because they don't know whether or not we will use them.

Senator MILLER. All right.

Now, you and I are on the same wavelength on tactical nuclear weapons. But I am getting out of that area into the limited use of regular nuclear weapons.

General McCONNELL. Intercontinental.

Secretary BROWN. Do I understand that you are asking whether a possible U.S. direct retaliation on the Soviet Union with nuclear weapons in a very limited way may not deter a massive Soviet conventional attack in Europe, for example?

Senator MILLER. What I am asking is whether or not you are inferring that from your statement here which talks about all-out thermonuclear war, which to me does not mean a limited use?

Secretary BROWN. All right. What I was maintaining in this statement, as you understood, was that an immediate all-out attack on the Soviet Union, as retaliation for a Soviet conventional attack in Europe, for example, is in my opinion of limited credibility, and, therefore, is limited in its deterrent effect.

Whether the possibility of a selected U.S. strike, a U.S. strike, say, to suppress Soviet defenses, a nuclear strike in retaliation against a massive Soviet attack on Western Europe, as to whether that is credible or not, that is harder to say. I would not completely exclude that.

I think that it is much less of a deterrent than it might have been 10 years ago. But I think it may still be some small deterrent.

Senator MILLER. Well, even though it is some small deterrent, it is the kind of a deterrent that you still want to have an option open on; isn't it?

Secretary BROWN. I would like to leave that option open.

DECREASING DAMAGE LIMITING CAPABILITY SHRINKS U.S. OPTIONS

Senator MILLER. Now, General Nazzaro, I have been puzzling over your statement on page 25 where you say:

I am not equally confident that for the foreseeable future we could engage the enemy successfully at all levels of nuclear exchange.

That gets us into these options that the Secretary would like to keep open.

But I take it from your statement that you are not very confident in these options.

General NAZZARO. No, Senator Miller. As I explained when I read the blue line version, by this I mean that the damage limiting capability we have is decreasing; because they are building more and more forces, [deleted].

I also stated that there was no question in my mind about the assured destruction task which we could do.

Senator MILLER. Well, now, if that is so, if we do not have the damage limiting capabilities, then these options below all-out nuclear war are not very good ones, are they? What profits us to have an option of using limited intercontinental nuclear weapons, or of using tactical nuclear weapons if we don't have the damage limiting capabilities that will make it worthwhile to use—to engage in such a less than all-out thermonuclear war?

General NAZZARO. I think the implication inherent there is that you have the deterrence as represented by your assured destruction capability to prevent this escalation, because if you have a mutual exchange, assured destruction vis-a-vis assured destruction, the results are pretty catastrophic.

Senator MILLER. But what you are suggesting is that you don't have the confidence, you are not at least equally confident in that type of an exchange because we do not have the damage limiting capabilities which General McConnell wants to have, and which I am sure you want to have. But your feeling is that we don't have it now, and in the foreseeable future apparently won't have it, which causes me to be concerned about the less than all-out thermonuclear war deterrent capabilities that we have.

General NAZZARO. Well——

Senator MILLER. To me this is a very, very critical point, because assuming the accuracy or the validity of the Secretary's statement—and I might say I thoroughly agree that it would be catastrophic for both sides, and, therefore, an all-out thermonuclear war is not going to serve as a deterrent—we have to move down in the scale if we are going to get into a deterrent situation. If, getting down the scale we do not have the damage limiting capability to go along with assured destruction, and you say you have no equal confidence that for the foreseeable future we could engage the enemy at all levels of nuclear exchange, then it seems to me we are in a kind of a rough spot.

General NAZZARO. This is interpretable based on what the policy is or what the belief is concerning deterrence. If it is believed that a deterrence is purely a capability to fulfill the assured destruction task, then theoretically this would deter, and if it deters, you need no damage limiting capability.

What I have said is that as I answered the previous question—based on the policy guidance that I have in terms of applying weapons in any plan, I give first priority to assure destruction, then I apply the remainder of the force, the best way we can, to do the maximum damage limiting we can. As they build up their offensive weapons systems, and they get more launchers, more "IR's" and more "MR's," then with the force we have we can do less damage limiting.

SCENARIO FOR LIMITED NUCLEAR EXCHANGE

Secretary BROWN. Senator Miller, I think I may have introduced an element of confusion by some of my answers. What I was describing as a limited strategic attack I would not call damage limiting nor would I associate it necessarily with the damage limiting capability. It is what may have been called earlier in these hearings strategic coercion and its feasibility is somewhat doubtful in my mind, also.

But it is, I think, quite a separate capability from damage limiting capability, and relies on the effects of nuclear strikes to change the overall balance of strategic capability during a war, so as to try to coerce the other side into stopping short of a catastrophic mutual exchange. Unfortunately, it depends in the foreseeable evolution of technology and expenditure of resources on both sides—it depends on both sides being willing to play the game.

As soon as one side decides it is not going to play that game any more, and goes for an all-out destruction capability, the other side responds with the same thing, and both sides are destroyed. That makes it a very delicate balance. And I am, therefore, not confident in the ability to play that strategy.

Senator MILLER. All right. I think you two gentlemen have cleared that up pretty well. Thank you very much.

Is my time up, Mr. Chairman?

Senator STENNIS. Yes, sir.

NEW AIRBORNE ALERT

Senator THURMOND. Mr. Chairman—could I just ask one question?

Senator STENNIS. Certainly.

Senator THURMOND. General Nazzaro, the St. Louis Post-Dispatch announced this afternoon that you had said beginning—I forget the date—anyway, soon—that SAC's B-52's will begin carrying nuclear weapons again. When will that take effect?

General NAZZARO. I am not sure that I made such a statement, sir, that the SAC B-52's will begin carrying nuclear weapons.

Senator THURMOND. Yes.

General NAZZARO. I said beginning July 1 we will institute "SEAGA."

Senator THURMOND. Institute what?

General NAZZARO. A new airborne alert-type operation. But I did not say the aircraft would carry nuclear weapons.

Senator THURMOND. My office just called me and said they were notified that the St. Louis Post-Dispatch had quoted you. I just wanted to know what the situation was.

(Discussion off the record.)

(Additional information was subsequently furnished for the record as follows:)

General Nazzaro: This is apparently what happened. On 25 April 68 we gave one of our [deleted] briefings to the Council on Foreign Affairs. In the course of this briefing, I pointed out that [deleted] we would be instituting a new type of airborne alert. I made no specific reference to resuming flights with nuclear weapons. Apparently, I was misrepresented and somehow the erroneous view got into the press.

Senator STENNIS. Back on the record.

Secretary BROWN. I think you would want that on the record.

Senator THURMOND. I might ask you this question, as long as it has come up. And this will go off the record.

(Discussion off the record.)

Senator STENNIS. Back on the record.

All right, Mr. Kendall.

SECRETARY OF AIR FORCE CRITERIA FOR NUCLEAR STRATEGY

Mr. KENDALL. Dr. Brown, there is a statement on page 4 which interests me. You recognize, of course, that the cornerstone of defense is assured destruction. However, you identify two other important criteria. One, the ratios of surviving population and industry must not be badly adverse to the United States; and, two, the surviving military balance should remain in our favor.

Now, do we build forces for those two things? Are those two criteria generally recognized in the Department of Defense?

Secretary BROWN. The forces are derived principally on assured destruction. When we try to measure the forces, various people in the Department are trying to find measures for the forces, and we have done some calculations on this kind of criteria. They are here, for example, in the force effectiveness tables and in calculations that the Joint Staff has done, for example. So these are recognized as possible measures.

But the derivation of the force remains fundamentally what is required to assure destruction. Not entirely though, for example, we put good CEP's on our weapons, although that doesn't greatly improve our assured-destruction capability.

Mr. KENDALL. Now, you have been a member of the Defense team since when—May of 1961?

Secretary BROWN. Seven years; yes, sir.

SECRETARY BROWN COMMENTS ON EVOLUTION OF NATIONAL STRATEGY

Mr. KENDALL. So you have had a pretty good opportunity to observe at first hand the evolution of our national strategy. As a matter of fact, you have contributed to it, I am sure.

Sometime over the past few years we have moved from a damage-limiting strategy to one in which damage limiting is sort of a fallout from assured destruction, as far as the purchase of equipment or hardware is concerned.

Can you tell us when this change occurred, and what was the reasoning for it, or the facts of life which made it necessary?

Secretary BROWN. I don't think that there was—that it is quite so clear a change from black to white, Mr. Kendall. I think that back in the late 1950's and early 1960's, assured destruction was also the principal criterion. There was a change in emphasis that occurred between, say, 1962 and 1965 or 1966. This change in emphasis, I think, came largely from the evolution of the Soviet forces. The Soviets, 4 or 5 years after we did each of the following things, also did them. They dispersed their silos, they hardened them, they put in the equivalent of a BMEWS to warn their bombers. They built nuclear sub-

marines, with ballistic missile launch capability. All of these things made their forces more survivable and, therefore, reduced our capability to limit damage—just as our previous actions had greatly reduced their ability to limit damage to them.

So an evolution did take place as it became clearer that assured destruction was feasible providing you planned well—and the Soviets did plan well after we began to plan well—and to the extent that assured destruction was feasible, damage limiting was much less feasible, or much more chancy.

Damage limiting then depends on the actions during a war that the other side takes. And, as a consequence of this, I believe that our criteria did evolve as we recognized that assured destruction was something that you could use to structure a force as a fairly clear criterion, and damage limiting was much more difficult to use in that way.

FACTS OF LIFE FORCE DEEMPHASIS OF DAMAGE LIMITING STRATEGY

Mr. KENDALL. Would I be correct in assuming that we were forced to get away from the damage limiting concept as a priority in our national policy because of the prohibitive cost of it in view of the Soviets' apparent determination to catch up?

Secretary BROWN. I would put it a little differently, Mr. Kendall, and say that we are forced by the facts of life and the nature of things to move away from damage limiting as a principal criterion, because we became aware that the Soviets, by the expenditure of substantially smaller amounts of money, could counter our efforts toward damage limiting—at least toward extreme damage limiting. It is cheaper for us to damage limit 50 percent of the population than to try to damage limit so that 80 or 90 percent of the population survives. And the exchange ratio of expenditures becomes more and more unfavorable to damage limiting as you try to preserve a larger and larger fraction of the population.

U.S. CAPABILITY VERSUS HARD TARGETS

Mr. KENDALL. General Nazzaro, what is our estimated probability of kill of a hardened Soviet ICBM which we target?

General NAZZARO. Well, if the hardness of the silo is [deleted] pounds per square inch or less, and with our MINUTEMAN, we could get [deleted] percent damage, with one shot. Statistically, you can interpret this to mean that if you have a hundred silos, [deleted] missiles would be prevented from firing.

Mr. KENDALL. That is targeting one missile against one silo?

General NAZZARO. Yes, Mr. Kendall. [Deleted.]

Mr. KENDALL. This is not [deleted] percent damage. This is the probability of [deleted] percent that the target will be killed; isn't it?

General NAZZARO. It is [deleted] percent damage to the silo.

Now, the probability depends on many other things about the silos [deleted]. That is why I said, statistically, it could be interpreted to mean [deleted] percent of the missiles would not fire.

Secretary BROWN. The [deleted] percent is derived by a probability calculation of the kind that you indicate, Mr. Kendall—a certain kill

probability for a certain damage radius, and a certain CEP. That is how it is derived.

Mr. KENDALL. General Nazzaro, given the present-day accuracy, and assuming both survive and penetrate, which is the best hard target killer, a manned bomber or ICBM?

General NAZZARO. Manned bomber.

Mr. KENDALL. On page 17 of your statement you say, "Each of our aircraft should carry optimized ECM equipment." Can the FB-111 do this without further reducing its already limited payload?

General NAZZARO. The FB-111 does not present too much of a growth potential where ECM is concerned. [Deleted.]

Mr. KENDALL. Does the FB-111 have the capability to carry decoys such as QUAIL without reducing its armament load?

General NAZZARO. It does not.

Mr. KENDALL. Suppose, General, CINCSAC, purely from the standpoint of a commander, you had the option of [deleted] the present ICBM or MINUTEMAN force in lieu of MIRVing the force. Which would you opt for?

General NAZZARO. That is very difficult question to answer. If the silos are sufficiently hardened, or if we can get dual capable hard silos to put MINUTEMAN III in, this is a solution. If we could get the [deleted] in the hard silo, with much more throw weight, this would be a better solution.

In effect, given the same degree of hardness in a silo, I think the potential lies most with that weapons system that has the greatest throw weight and the best accuracy. The greater throw weight enables you to MIRV the most, if you can have more MIRV's with good accuracy, it is better than having few MIRV's with poor accuracy.

Mr. KENDALL. The larger the throw weight, the more MIRV's you would be able to put on a vehicle.

General NAZZARO. Potentially.

Senator STENNIS. All right.

(Discussion off the record.)

Senator STENNIS. Back on the record.

FIGHTER SUPPORT FOR AWACS

Mr. KENDALL. General McConnell, in the proposed AWACS F-106X air defense system, would one of the functions of the F-106X be to defend the AWACS?

General McCONNELL. The AWACS shouldn't actually require any defense, because it is able to see the attacker coming and can fall back. Therefore, they shouldn't require a defense. [Deleted.] It shouldn't require any defense—AWACS. Not in terms of defense of the continental United States.

Now, if we were going to use them overseas, which we plan to do, then we will have to have some defense for them.

Mr. KENDALL. Would you use the F-106X?

General McCONNELL. No, we would use the new FX.

Mr. KENDALL. What about the F-12?

General McCONNELL. We would not use the F-12 overseas, at least initially. We would use them in the United States.

Senator STENNIS. You say the FX?

General McCONNELL. Mr. Chairman, the FX is a new proposal for and air-to-air superiority fighter. This proposal is nearing a decision for contract definition either in December or January. We have already received the authority to go ahead with the engine, sizing of the engine, and steps of that kind.

LEADTIME CAN BE SHORTENED ON NEW ICBM, BUT NOT ON AMSA

Mr. KENDALL. General, in his testimony last Friday, Dr. Enthoven said in his view the new AMSA at this point in time would buy us more capability than we need. As a matter of fact, he indicated that that was the basis of a decision not to provide for contract definition for AMSA with fiscal year 1969 funds. Do you believe it would buy us more capability than we now need?

General McCONNELL. It is a matter of judgment. My judgment differs from his, Mr. Kendall. I don't think it does buy us more capability than we need.

Mr. KENDALL. Would AMSA and the [deleted] both slip year for year and month for month with a delay in going to contract definition?

General McCONNELL. AMSA has slipped for the past 2 years in contract definition. [Deleted.] We have asked for contract definition on [deleted]. That request was disapproved for fiscal year 1968 and fiscal year 1969. I don't believe that a 1-year delay is going to make it slip very far in view of the fact that we do have the authority for the guidance system that would go into it. We have the authority to make—to research and develop the dual capable silos, which would accept the [deleted] as well as MINUTEMAN III. We shouldn't have any problem with the warhead. The only thing we would have any problem with—I will defer it to Secretary Brown—would be the booster.

Secretary BROWN. The longest leadtime item is the silo, and we are going ahead with the dual capable silo. The next longest leadtime is the guidance system. We have a program which will reduce the leadtime on that. The Chief is exactly right. [Deleted] will not slip a year as a result of a contract definition deferral. It might slip a couple of months, but it won't slip a year.

Mr. KENDALL. What about AMSA?

Secretary BROWN. That has been slipping a year per year now for about 2 years—as I think Dr. Foster indicated to you, he is looking at what we might be able to do to shorten the leadtime without going to contract definition. And I just don't know yet whether that is feasible.

Mr. KENDALL. Dr. Brown, on page 19 you said that if Soviet defenses continue to increase, and additional penetration aids become necessary, we will have to increase the payload of our programed bomber force. What would that do to the FB-111? Wouldn't that be especially sensitive to any increase in payload?

Secretary BROWN. The fastest way to increase our payload above the programed force, would be to either retain B-52's in the force or to buy more FB-111's. Both of those increase the payload we can deliver. As of 1975 or 1976, if you go ahead with AMSA, you can then increase the payload by buying those.

Mr. KENDALL. You mean overall payload?

Secretary BROWN. That is right. Not per bomber. Overall payload is exactly what I meant, Mr. Kendall.

FOBS ADDS FLEXIBILITY TO SOVIET FORCE

Mr. KENDALL. Going to FOBS for a minute, Dr. Brown, assuming it is an inefficient weapon and a poor choice for a strategic system, in your words, isn't it true it adds flexibility to the Soviet offensive force, and compounds our problems of detection and defense?

Secretary BROWN. It forces us to come up with new warning systems. But this is one where we anticipated them. We came up with a warning system that counters FOBS, went to work on it three and a half years ago, and it is ready when FOBS is ready. As a result, I think that their expenditure on FOBS has been more than our counter will cost us. It has cost them more than our counter has cost us. So I still don't think it is a very good idea.

But if we had not done anything, it could force us to rather elaborate measures to counter it.

Mr. KENDALL. But it would be an adequate weapon against a soft target, such as an airbase?

Secretary BROWN. It would, if you didn't have warning against it. But we have better warning, and plan to improve our warning.

Mr. KENDALL. How much warning do we have at present—that is with respect to FOBS—with over-the-horizon radar only, [deleted].

Secretary BROWN. The over-the-horizon system in now gives us something like [deleted] warning that a missile has been launched. As we add to our over-the-horizon-radar capability, we should get [deleted] minutes of warning. [Deleted.]

Mr. KENDALL. I know AWACS has been approved for contract definition, but is it adequately funded at this time or will it have to await fiscal year 1969 funding?

Secretary BROWN. There are some fiscal 1968 funds that have been made available from the emergency fund, and from the fiscal 1968 money that we already had for overland radar technology. The full contract definition probably will wait until fiscal 1969, partly as a matter of funding, and partly just because these things always take longer than you expect. Fiscal 1969 is almost upon us.

Mr. KENDALL. Has this delayed the program, or is it delaying it?

Secretary BROWN. I would say not substantially, but there may have been a month or two delay.

Mr. KENDALL. With respect to looking for ways to reduce the development leadtime on AMSA from 8 to 4 to 6 years that you mentioned, without making a full commitment to production, doesn't that imply some sort of developmental approach different from contract definition? What courses of action do you have that would give that desirable result, and what is your level of confidence you can get that result?

Secretary BROWN. Well, this is all very speculative, Mr. Kendall, and I hope it is taken as such.

What you could try do to—and one suggestion that has been made is you build a prototype. I don't think that really serves the purpose, because after you have built the prototype, one, you are not in a competitive position as between contractors; and, second, you have not really solved all the integration problems—avionics, airframe, and

so on—which actually take up a large fraction of this 8 years. So that is one way to do it. But I don't think that will work.

Another way—I will have to look at it some more—is to go through a contract definition, but reduce the concurrency of development and procurement, thus not committing yourself to the procurement quite so early. In other words, stretching out the development time. Under those circumstances, you might make up some time by going ahead with development for the first few years.

Mr. KENDALL. Doctor, you mentioned earlier [deleted].

Secretary BROWN. [Deleted.]

So our first flight in that direction was taken [deleted].

Mr. KENDALL. We have not flown a MIRV bus, and this is a step forward in the technology.

Secretary BROWN. That is right.

SECRETARY BROWN HAS CONFIDENCE IN MIRV

Mr. KENDALL. We have not verified the accuracy or capability of MIRV. Do you have a very high-confidence level in its workability and successful development?

Secretary BROWN. I have a high-confidence level they will work, because we have done many things like them. We have, for example, dispensed eight satellites from one booster, which is a similar, although not identical, thing. We have the guidance components to do this. Putting it together will be a job. [Deleted.]

Mr. KENDALL. How would it affect our force planning, and planning our deterrence, if the [deleted] warheads of the MIRV payloads came with an accuracy of [deleted] rather than a [deleted]?

Secretary BROWN. It would not affect our assured-destruction capability at all, hardly at all, because that doesn't depend upon the difference in accuracy between [deleted]. It would affect our damage-limiting capability, but it would not make it worse than it now is—it would only mean that it would not get better than it now is as fast as we plan it to. You see, the MIRV at a [deleted] CEP is designed to have a higher kill probability than our present missiles—higher than the [deleted] percent General Nazzaro mentioned. And it won't have the desired kill probability unless it is [deleted] CEP. But even at [deleted] it will be as good as what we have now.

USE OF SAC TANKER IN SOUTHEAST ASIA

Mr. KENDALL. General Nazzaro, you mentioned this in your prepared statement. In view of the importance of the tankers to the strategic program, what effect is the use of them in Southeast Asia having on the fleet from the standpoint of wearout that might give some problems if and when you need them for the strategic role?

General NAZZARO. All of the 52's and tankers that are there, if we need them for the strategic role, I presume I would be given authority to recall them. So long as we are in the war there, I have certain functions that I have been directed to fulfill, and I am fulfilling those.

General McCONNELL. He asked about wearing them out.

General NAZZARO. Excuse me. No, sir; we have no fear of wearing the tankers out in the operations there.

Senator STENNIS. Senator Miller.

CRITERIA FOR ASSURED DESTRUCTION

Senator MILLER. Thank you, Mr. Chairman.

Mr. Secretary, in one of your charts you have an assumption of achieving two-thirds fatalities in defended cities. Where did that assumption originate?

Secretary BROWN. That is a criterion we established in measuring the force, Senator Miller. One thing that bothered us was that in earlier measurements of force, we were trying to maximize fatalities in the Soviet Union by the application of the force, and we found that we were doing that, with calculations were doing that, by not attacking the defended cities, because you had to expend more weapons on defended cities to penetrate the defenses, and then produce fatalities, than you were having to expend on very small cities.

So we were maximizing the fatalities in the Soviet Union by the proposed laydown, but the first [deleted] cities were untouched, because they were defended, and it was just—you could not get as many fatalities against defended as against undefended cities. We said that is not a practical way to do the laydown. So we imposed the additional requirements that even at the cost of reducing the total fatalities, we would insist that the laydown be such as to produce two-thirds fatalities in the defended city. And as you see—I am not sure which example you have there—you get [deleted] percent overall fatalities with that criterion, whereas you could get [deleted] percent if you did not have that criterion, but the top cities would go unattacked. And we did not think that was an appropriate way to plan the laydown of the force.

General McCONNELL. And not get the industrial force base.

LARGE SCALE DEPLOYMENT OF ABM NOT EFFECTIVE USE OF RESOURCES

Senator MILLER. Now, on page 29 you said, "But a large scale ABM system would not be a good idea in the light of current technology. The Soviets could penetrate our defenses at substantially lower costs than we could build it." Doesn't this work in reverse, too, as to them?

Secretary BROWN. That's right. I think that a large scale deployment of ABM's is not an effective use of their resources, either. But I do not have any influence on that decision, particularly. They do not pay any attention to my analysis.

Senator MILLER. But apparently they are going ahead.

Secretary BROWN. No, I would say not—at least not yet, Senator Miller. There is evidence of a deployment around Moscow. There is not yet any evidence of a substantial deployment of a real ABM capability around other cities yet.

Now, they may go ahead and do it. But the large scale deployment we have seen of the TALLINN system is now generally agreed not to be primarily directed at ABM, and in my opinion it has almost no ABM capability

SCENARIO OF BOMBER ATTACK ON MINUTEMAN

Senator MILLER. I don't want to overpress this point, but we have already touched on this. On page 31 you say, "Under these circumstances [deleted] Soviet bombers might arrive over the United States

destroying as many as [deleted] MINUTEMAN silos." And then you point out that if we forced a low level attack, reduced the potential number of missile silos destroyed to something less than [deleted]. And I find it very inconceivable we would wait and let them do this without getting those missiles off, or at least getting a good portion of them. I cannot imagine us sitting and waiting for them to destroy [deleted] MINUTEMAN silos, or even to let them destroy [deleted].

Secretary BROWN. It depends on how the war has proceeded up to that point. If cities have not been attacked up to that point, then I think this is a possible evolution of a scenario. But if cities have been attacked on both sides, I agree with you that we are unlikely to wait while their bombers come over to destroy our missiles, and they are unlikely to wait with their missiles until our bombers come over. This is an argument against bombers as a counterforce, or damage limiting capability. It is an argument we should all be aware of. I think it is a real argument.

Senator MILLER. We are not in a position to change the targeting of those [deleted] or [deleted] so that if it appears that they are only after our silos, that we can go after only their silos.

Secretary BROWN. Oh, yes. I think that our missiles are targeted with alternate targets.

Senator MILLER. And those can be changed on a very—a moment's notice?

Secretary BROWN. Yes. The targets are already dialed in in alternates and it is a matter of which point on the dial you dial.

Senator MILLER. Well, then, we could make the change so that we would not lose them all, even if they were concentrated just on our silos.

Secretary BROWN. That is correct, we could. But if we waited—if the bombers came over and knocked out the missiles, we would have lost that choice. Of course, the whole purpose of this passage is to explain with even a modest air defense we could change the number of missiles that are thus at risk from [deleted] down to [deleted].

Senator MILLER. All right.

Now, last, on page 38 you say—

Moreover, I am confident that our exploratory and advance development programs in American productive capacity can offset any attempt by the Soviet Union to overcome our strategic forces in the future.

Is there any significance to that word "can" instead of using the word "will"?

Secretary BROWN. No. I think that the difference between "can" and "will" is making the decisions, some of which have to be made sequentially. I think we have allowed enough time to make the decisions. And I have confidence that we will make the necessary decisions.

Senator MILLER. You are referring to our exploratory and advance development programs which are now in being, I assume.

Secretary BROWN. Yes.

Senator MILLER. And you are referring to our American productive capacity now in being. If you are, why can't we say, "will offset"?

Secretary BROWN. To turn it from "can" to "will" implies decisions as time makes them necessary to produce and deploy the forces. Those have not been made yet, because they have not had to be made. This is a conditional sentence in effect, because it refers to Soviet attempts

to overcome our strategic forces in the future. As they make those attempts, we have to make the decisions to deploy.

Senator MILLER. So that with the appropriate decisions, they will offset.

Secretary BROWN. Yes, sir.

Senator MILLER. Thank you very much.

SENATOR STENNIS REQUESTS COST ESTIMATES

Senator STENNIS. Thank you, Senator.

Gentlemen, I want you to give me a brief statement now by way of an answer, and then furnish the precise figures for the record. I would like an estimate of the cost on the AMSA. Include the estimated research and production cost and deployment and operating costs. Give us the same information on the advanced ICBM, the F-106X, the F-12, AWACS, and the warning systems we have discussed.

Secretary BROWN. You want this for the record, Mr. Chairman?

Senator STENNIS. Yes. I believe those figures are readily available.

Secretary BROWN. Yes. Do I understand correctly you want AWACS, F-12—

Senator STENNIS. I may have said bomber. I meant the follow-on ICBM.

Secretary BROWN. Yes, sir.

Senator STENNIS. And then the over-the-horizon radar.

Secretary BROWN. Yes, sir.

Senator STENNIS. And then part of that system—you have a satellite in there somewhere.

Secretary BROWN. [Deleted.] That's not part of the same system, but it's one of the ones we discussed. Yes, sir.

Senator STENNIS. I am not saying I am opposed to all of those, but I want to get the cost of them. I want to get those cost figures.

(The information furnished is classified.)

AIR DEFENSE EFFECTIVENESS IS QUESTIONED

Senator STENNIS. There is another point on which I am not yet convinced. The old Russian bombers are considered to be a threat. You are now proposing a new detection and defense system against them. I have not been sold on that yet. I don't recall what goes with it. I was on the Construction Subcommittee when the question was deploying the NIKE HERCULES. I asked the question: If there are a hundred coming over, how many will we knock down? The answer was 100 out of 100. That was a good many years ago. Now you say [deleted] of them would penetrate. I know you have found a difference in tactics and so forth; but I want to pose that question. We are not going to decide it here, of course, but it's coming up. And I would like for you to prepare a special answer to that—that is, elaborate on this question—because I think it's going to give us trouble. I don't mean for you to answer right now.

Secretary BROWN. Yes, sir; we will provide an answer.

General McCONNELL. Senator Cannon brought up the same thing this morning.

Senator STENNIS. Yes. He asked some very good questions on it, too. I wish he could have come back.

I wanted him to follow up on that question.

Did I make clear what I want?

Secretary BROWN. Yes, sir.

Senator STENNIS. You take the time to figure it out.

(The information follows:)

A CONCEPT FOR AIR DEFENSE MODERNIZATION

Our *present* system was deployed in response to the developing Soviet threat of the early 1950s. We were concerned with Soviet aircraft that could, by flying at *high* altitudes, deliver a full load of nuclear weapons. Although constantly refined over the years, the system today, almost two decades after the concept was established, remains basically the same.

During the initial years, against the high altitude threat for which it was designed, the system provided effective defense; and today, though the enemy now expects to successfully penetrate (as we do) at low altitude or use stand-off air-to-surface missiles (rather than enter our defenses), the present system seems to serve us well. Because of his assessment of our current air defense capability, the enemy has elected to use these tactics even though they reduce [deleted] the damage he can hope to achieve. Specifically, use of a low-altitude approach effectively reduces the range of his bombers. The stand-off missiles are heavy and must be carried externally. This induces aerodynamic drag and reduces the payload he can carry [deleted] in the case of the heavy bomber. Since only part of his force has the range to penetrate at low altitude, he is reduced to attacking with fewer aircraft. He also pays an additional penalty due to the decreased accuracy of the stand-off missile. This "virtual attrition" (as we call it) has exactly the same effect as if we had destroyed [deleted] of his available bomber force before it even became airborne, and leaves only [deleted] of the potential threat which must be countered by our air defense weapons. Thus, our current system significantly degrades the enemy's capability. [Deleted.]

There is, however, no assurance that the enemy will continue to react with this virtual attrition unless we take positive measures to enhance the credibility of our air defense. [Deleted.]

Our primary deficiencies are our inability to detect and kill low altitude aircraft, and the vulnerability of our Command and Control system to a missile attack. Other present weaknesses include [deleted] interceptor deficiencies which will be addressed later in the briefing. There are a number of other threat developments which are well within the capability of Soviet technology and which would further degrade our defense against an air attack.

[Deleted.] In addition there is the possibility of a supersonic bomber as an outgrowth of the supersonic transport program.

One important question is whether or not an expenditure to modernize air defense is justified in view of our acknowledged vulnerability to missile attack and the fact that it alone could devastate the nation. In this regard, let me discuss briefly several aspects of this issue.

The question is really whether or not any air defense is justified. In addition to the case which Secretary Brown covered in his testimony, let me cover one additional attack scenario—one of many rational Soviet options which we have analyzed. This is a case in which the Soviets use their missiles for a massive attack on our Assured Destruction Forces followed by [deleted] heavy bombers against our populated industrial areas. With no air defense, the bomber attack could be expected to kill 73 million Americans, which is 33% of our population. The same attack with the proposed F-106X/AWACS force in being would reduce our losses to 8 million lives, or 4% of our population. In this case, having an air defense would mean the difference between defeat and survival as a nation.

The scenario just discussed points out the damage limiting contribution of air defense. Such defenses can also be used to protect our Assured Destruction Force, as has been previously demonstrated. Both of these contributions provide a means for reducing the enemy's attack options. An air defense can be very valuable to complement our ABM system in defending against an attack by a minor power (Nth country). It will prevent damage from small attacks which may be launched by countries other than major nuclear powers, from accidental attacks from any source, and from the bluff and blackmail tactics that could otherwise be employed against us. Lastly, high quality but relatively small air

defense forces will enable us to effectively control the airspace around us to ensure against its use for nuisance or illegal purpose. Just as it is clearly to our advantage to deny an enemy the inexpensive and efficient option of employing gravity bombers, it is also to our advantage to preclude the national irritations, embarrassment and censure which could be brought about by the absence of any air defense system. For these reasons, it is our conclusion, first, that an air defense system is essential to the nation's welfare regardless of the posture of our defense against missiles and, second, that air defense remains a key element in our overall deterrent including threats of lesser size.

On the basis, therefore, that an air defense is essential, the question is—just what should such a defense consist of? This depends, of course, on the composition of the threat and our confidence in the current estimates. [Deleted.]

Over the past several years, we have engaged in serious efforts to develop a feasible means of providing an adequate air defense at a cost acceptable in terms of our national resources and commitments. The current system is expensive to operate and decreases in efficiency in the face of enemy technology improvements. In the search for an appropriate solution we have conducted a number of studies and research and development projects. During the past year study efforts have intensified, and important technological advancements long sought in our development projects have been successfully demonstrated. The new systems shown on the chart have resulted from our studies and development programs. Together they provide a basis for an across-the-board modernization of our air defense system. It is now apparent that a more effective force can be provided at a lower cost over the next ten years than the cost of operating our current air defense system. The investment costs for the new system can be more than offset by logical reductions in the present force since fewer interceptors and radar sites will be required. As a result, annual operating costs for an improved force, after investment, would be expected to be one-half billion dollars below today's annual cost of \$1.34 billion for air defense. Later in the briefing, after acquainting you with the concept of the force we propose, we will discuss the reductions referred to.

Using the new technology, the proposed system would be considerably changed from that now employed. FAA radars would cover the center of the country, and in the boundary areas the military network would be fully integrated with the traffic control facilities of the planned National Airspace System. Over the Horizon, [deleted] radars would extend detection range to a distance of [deleted] preventing aircraft from undetected approach prior to missile attack. Both high and low targets would be detected throughout the wide detection band shown. The OTH, along with the DOD/FAA joint-use ground radars, could provide surveillance and control for the peacetime detection and identification functions at a lower total cost to the nation.

The combination of improved interceptors and Airborne Warning and Control aircraft would provide a survivable force. Control of the interceptor would be transferred from the [deleted] OTH/ground radar net to the Airborne Warning and Control System (AWACS) in the event of an attack. The interceptors would be equipped with the new look down/shoot down capability, providing effective ranges far beyond the radar/missile systems now in use. Perhaps the most significant element of the new system is the AWACS shown here in a cutaway view. We now have available for the first time an airborne surveillance radar that can detect and track a target flying in the radar ground clutter reflected from the earth's surface.

In peacetime AWACS will complement the OTH radars by covering the approaches [deleted] which may be beyond OTH capability [deleted]. With a part of the force airborne at all times and the remainder on a high state of alert, most of the AWACS will survive a missile attack. The AWACS can form a surveillance and control system independent of the ground systems. Shown is a typical perimeter barrier which the AWACS could form to meet a threat [deleted]. AWACS will extend the depth of the battle area far beyond the continental limits, making unnecessary the proliferation of military-equipped radars in central areas of the country; and, in the event of loss of the [deleted] OTH and ground based surveillance radars, the AWACS can effectively employ the entire interceptor force even under heavy attack conditions. To assure its own survivability, the AWACS can fall back well in advance of an attacking interceptor. Other tactics and defensive measures for AWACS are also being studied.

In summary, a modernized force, which is obtainable at less cost than maintenance of the current system, can effectively perform the mission of air defense

against the current and forecast threat. It can also provide an adequate hedge against an unexpected sophistication of the threat, such as a longer range stand-off missile and supersonic or advanced strategic aircraft. And, perhaps most important, it can ensure the continued virtual attrition exacted by an air defense system in precluding enemy use of gravity bombers.

We have now covered the requirement for air defense, the need for improvement, the new techniques available, and have introduced a modernized force. We would like now to focus for a moment on the selection of the interceptor, after which we will give you a brief résumé of the phase over with associated costs. May I introduce Major Ralph Graves.

I would like first to discuss some of the major areas of performance which contribute to interceptor effectiveness. The airplane must have adequate cruise range and speed to intercept and destroy the bomber before it reaches its air-to-surface missile firing point, as well as the dash speed necessary to turn, overtake and re-attack a raid. This does not necessitate the high speed turning required in dog fighting. An interceptor is primarily a missile launch platform and it is the missile that performs the final maneuvering.

The interceptor should have a radar with the capability to discern the radar reflection of a low altitude target from other radar reflections from the ground behind it—that is, to look down. The need for this type of interceptor radar was recognized in the late 1940s. We believed we had a theoretical solution in the mid-50s and development was subsequently initiated. Now this type of radar has been fully demonstrated in the YF-12A flight test program. Targets have been tracked [deleted] more than [deleted] miles away from the interceptor.

The missile should be compatible with the interceptor's radar; have a look down capability, and be able to reach any targets without the interceptor having to change altitude. It should have accuracy and warhead kill radius sufficient to assure a high probability of kill. [Deleted.]

Over the past year, we have intensively analyzed and evaluated all plausible candidate interceptors in many configurations. The three best candidates are: the modernized F-106, referred to as the F-106X; an F-4 equipped with a miniaturized F-12 radar, referred to as the F-4X; and the F-12. All have sufficient cruise speed and range to intercept bombers before the launch of [deleted] nautical mile air to surface missiles and the dash speed to come around and make repeated attacks on a raid consisting of subsonic bombers. All would have look down radars with adequate radar range.

While only the F-12 has the speed and altitude capability to get into a position to visually identify a supersonic target, all the interceptors could intercept and destroy such a target [deleted]. As to the missile load, all the interceptors can carry long range [deleted] missiles [deleted].

It is not possible to adequately evaluate interceptors in terms of their performance alone. We must measure their effectiveness in terms of the threat or threats they may have to meet. We have been using the four threats shown here in our analyses. The first of these approximates the National Intelligence Estimate of the number of heavy bombers which could reach the United States in the early 1970s. It consists of [deleted] heavy bombers each equipped with a [deleted] nautical mile air to surface missile. Since the Soviets have acquired an [deleted] the Air Force feels that they can [deleted]. The second threat therefore contains [deleted]. In addition to these threats which are representative of current operational capability, we considered two advanced threats, both of which are within Soviet technical capability. The Soviets could field supersonic bombers and their [deleted] heavy bombers could be equipped with longer range [deleted] missiles. We feel that these are reasonable threats against which to design and evaluate our interceptors. The results of our evaluation are shown on the next chart.

Please note that effectiveness will be shown on this chart in terms of the number of bombers which survive each interceptor force. Thus, the lower the number on this chart, the better the interceptor.

First is the effectiveness of the current force against these threats. Its effectiveness is moderately high only when [deleted].

Next, we see a force of F-4Xs. It is only somewhat better, the greatest improvement being in the [deleted] heavy bomber case on the left where a look down radar is most useful. But even with the added detection and warning provided by AWACS, there are too few F-4Xs to do a creditable job. Enough would be prohibitively expensive.

However, because the F-106 airframes are already in the inventory, an F-106X force of equal cost to the F-4X force and having approximately the

same aircraft performance provides sufficient numbers of interceptors to do quite a good job, particularly against the two threats on the left. Only [deleted] of the [deleted] heavy bombers equipped with [deleted] mile air-to-surface missiles survive.

Greater effectiveness against the threats containing [deleted] mile air-to-surface missiles or supersonic bombers can be provided by use of F-12s. However, the minimum size pure force of [deleted] F-12s costs about a billion dollars (10 year systems cost) more than the F-4X and F-106X forces shown above.

It became apparent from the studies that mixed forces employing a few F-12s offer rather large increases in effectiveness. When an interceptor force must defend the whole U.S., the interceptors must be based so as to cover all attack routes. Some of these routes will not be used and thus interceptors are located in areas through which the enemy is not attacking and are wasted. With a mixed force, this can be done with the cheaper interceptors while the F-12s are placed where they will be used with guaranteed maximum effect in the defense of high value targets sure to be attacked.

It works out that mixed forces using the number of F-4Xs or F-106Xs shown above along with a [deleted] UE force of F-12s have costs approximately the same as the pure F-12 force and can be directly compared to it in effectiveness.

If you compare this F-4X/F-12 force to the pure F-4X force, you can see the large improvement made by the F-12s. However, due to the relatively few aircraft in the total, it is still only marginally better than the pure F-106X force except in the case of the threat with [deleted] mile air to surface missiles where the long range of the F-12 is very valuable in intercepting the bombers before missile launch.

However, when we add F-12s to F-106s, we get the advantages of both numbers of interceptors and of highly capable interceptors. As you can see, this is the best of the forces considered for all but the supersonic bomber threat. It is extremely effective against the first and most likely threat, reducing bombers surviving to the missile release point to [deleted] of the [deleted] bombers. It is almost twice as good as any of the other forces against the [deleted] bomber threat, and equal to a pure F-12 force versus the long range missile carrying threat. Only the pure F-12 force is better against the supersonic bomber.

The mixed force has the additional advantages that it would keep available our ability to react to an advanced threat in fairly short order as well as provide quite good defense against such a threat as it first comes into being. In fact, such a capability may well deter the Soviets from fielding such a force [deleted].

Our studies also have shown that a pure F-12 force is superior to a mixed force (which includes [deleted] or more F-12s) only under one combination of circumstances. This would be the case only if the more sophisticated threats materialized, and if in addition, it were essential to reduce bomber penetrations to a low level—a requirement which would only make sense if we also possessed a very effective antimissile defense system.

We are quite certain that the F-106 can be modernized in a manner which takes maximum advantage of the current investment in the system and that the resultant system will be useful for a reasonable period of time. Our reasons for believing this are addressed on the next few charts.

The changes to modernize the F-106 are illustrated in red in this drawing. We will replace the radome to make room for a larger radar antenna, and a new look down radar having [deleted] times the power of the old. This will about [deleted] the bomber detection range to approximately [deleted] miles. Modern state of the art will be used to miniaturize the remainder of the fire control system, thus making power and space available for the new radar, and increasing system reliability and maintainability. Lastly, the missile bays will be modified to accommodate the new missile. There is no significant change in external configurations or aircraft performance.

You see here depictions of the three-dimensional launch envelopes of the current F-106 with its FALCON missiles and of the F-106X with its new missile.

Use of the new radar and the [deleted] missile will allow the F-106X launch envelope to extend to [deleted] NM in range, and from the ground to over [deleted] feet.

Having modernized the armament system, there remains the question of the airframe and engine life. The F-106 was given rather extensive fatigue testing to prove its safety and operational life. An F-106 airframe was tested to an equiv-

alent of 18,000 flight hours. As a result of our testing, fatigue life is considered to be very conservatively 4,500 hours. The airframe has been certified to only [deleted] hours, but this can be extended to at least the full 4,500 hours based on the testing already done.

At the present, the average flying time on the F-106s in the fleet is approximately 1,600 hours and flying at the present rate, they will reach the 4,500 hour point in 1982. Fatigue tests are used to determine what parts can be expected to fail first so that steps can be taken to either strengthen these or plan for replacement. Interceptors are not normally flown in a manner which places high stress on them and the delta wing design of the F-106 is stiff and strong. We have had no structural problems with the F-106.

As to the engines, we have an adequate number and no new production will be required. With time they will become more expensive to maintain, but if necessary, all of the engines could be taken through an overhaul line and returned to near new condition for about \$12 million, or one percent of the total estimated ten-year operating costs of the F-106X force.

Thus the F-106X airframe, representing about the same technology as the F-4, can be expected with high confidence to last into the 1980's. It will have largely new avionics, a new missile along with its present missiles, and an engine which is adequate in terms of both performance and life.

We have told you that the costs of deploying an improved air defense could be offset by acceptable reductions in the present force. With this chart, I will show the reductions we propose in current equipments and the composition of the new system when it is finally achieved. Today, we have [deleted] squadrons with [deleted] interceptors. In our Command and Control system we have [deleted] control centers and [deleted] operating radars. These numbers will be reduced by [deleted] to the figures shown in the center column. By this time, we would have achieved a net reduction of [deleted] interceptors, [deleted] control centers, and [deleted] radars. This force level would be retained until [deleted] at which time portions of the improved system will be achieving initial operational capability. The final phase-down of our old system would then begin.

By [deleted] the modernized force would reach full operational capability. The one squadron of present interceptors remaining is the unit in Hawaii. The improved interceptor is the F-106X. The new improved interceptors are afforded a high degree of mobility and survivability by the addition of C-130 aircraft for direct combat support. The C-130s will maintain alert with the interceptors, pre-loaded with the personnel and materiel needed to rearm and re-launch fighters from any airport with suitable runway and refueling facilities. [Deleted] of the [deleted] control centers and [deleted] of the [deleted] radars would by this time be in joint use facilities with the FAA. Of the [deleted] remaining radars, [deleted] will be new, improved, but inexpensive Gap Fillers necessary to ensure a leakproof [deleted] surveillance. The remaining [deleted] radars are those located outside continental United States. [Deleted] OTH radars will extend our detection capability [deleted]. During peacetime, the [deleted] Airborne Warning and Control aircraft would be available to supplement both the Control Centers and ground radars. In the event of hostilities, they provide a survivable control and surveillance system. The improved equipment would provide air defense effectiveness unattainable with the present force; and the reduction of force size would provide significant savings to be applied to the investment cost of the new system.

This chart shows the cost breakdown of the proposed air defense program in comparison to cost of the current forces. Costs are shown over the ten-year period from FY 69 through FY 78 in billions of dollars per year.

The current air defense forces, as shown here by the straight line, are costing us about \$1.34B per year. If we were not to modernize our air defense and were to continue the current forces, the total ten-year cost would be \$13.4B.

The annual costs of our current systems as they are phased down are shown at the lower part of the chart. The annual costs of the new systems as they phase in are shown as additive to those of the current systems retained. On top are the acquisition costs of the new systems. F-12 costs for a [deleted] UE force are shown as additive to the basic program with acquisition costs of about [deleted] and operating cost of about [deleted] per year.

As you can see, the proposed modernization requires rather large investments during the first years. However, this is more than offset by the low annual O&M costs in the last [deleted] years during which these costs are reduced by \$580 million per year—from the current \$1 billion 340 million to \$760 million per year.

The present forces continued for ten years would cost us \$13.4B. The proposed modernization program would cost \$12.1B. We thus save \$1.3B over the first ten years and \$580M per year thereafter. [Deleted.]

In summary we feel that bomber defense is still required no matter what steps are taken toward ballistic missile defense; that to retain the credibility against the bomber threat our air defenses must be modernized; that the F-106X provides the optimum initial interceptor for use with AWACS and OTH in a modernized air defense; and that adding a few F-12s to an F-106X force greatly enhances that force and keeps alive our capability to react quickly to advanced Soviet bomber threats. Lastly, a modernization program results in considerably lower air defense costs over a ten year period. This concludes the briefing. We will be most happy to answer any questions.

Senator STENNIS. All right, Mr. Kendall.

COST EFFECTIVENESS OF FB-111 VERSUS AMSA

Mr. KENDALL. Dr. Brown, does the Air Force have an in-house capability for making system analysis studies?

Secretary BROWN. Oh, yes, indeed. I think, in my opinion, it is a very fine one, and I think in Dr. Enthoven's opinion we have a very good capability.

Mr. KENDALL. Have you evaluated the relative cost effectiveness of the FB-111 versus the AMSA; and, if so, what was the result?

Secretary BROWN. We have looked at that question. I think we can provide some answers for the record. But what you must remember, Mr. Kendall, is that one of these is available in 1969 and the other one is available in 1975 at the earliest. It is too bad Senator Symington is not here. I would repeat to him the story about how you could not fly blueprints, which he keeps telling us all the time. But I think it is a very well-taken point that he makes. You cannot compare two systems that are in different time frames without making appropriate adjustments.

Senator STENNIS. Well, we already authorized the FB-111's—[deleted], I believe—you asked for this year. They ought to be evaluated here in view of the threat.

Mr. KENDALL. You will furnish that for the record?

Secretary BROWN. Yes, sir. We will furnish our comparison of the capabilities, and I think what we will show is that for 1969 through 1975 the FB-111's do a good job—in fact beyond that—a good job of replacing the C's through F's. They do not compete with the G's and H's which have a different range capability.

(The information furnished is as follows:)

Extensive cost effectiveness comparisons of the FB-111 and the proposed AMSA design have not been pursued because these are not intended as competing systems. The FB-111 is being procured as a replacement for the older B-52s (models B-52C-F) starting in 1969 whereas the AMSA is intended primarily as a replacement for the newer B-52s (B-52 G&H) in the post 1975 time period. A complete operational force of AMSAs could not be available until FY-78.

The comparisons between AMSA and the FB-111 were conducted in conjunction with our examination of desired characteristics for a new bomber. These studies led to the selection of characteristics for AMSA which include the best features of the B-52 and the FB-111 and, therefore, would make the AMSA a more effective bomber than the FB-111. The AMSA would have the advantage of greater payload capability, longer range, larger crew and more advanced avionics. If it were assumed that these are competing systems in the same time period, the AMSA, because of its improved design features, would have a cost effectiveness advantage over the FB-111.

A range comparison of these aircraft follows: [Deleted.]

SUPERSONIC SPEED COULD BE IMPORTANT ASSET TO ADVANCED BOMBER

Mr. KENDALL. How important is the question of speed in AMSA? Dr. Enthoven said that subsequent to the B-70 we learned that the speed of the bomber was not a particularly important point in the total effectiveness of the system. Since you favor a supersonic bomber, I take it you disagree with that.

Secretary BROWN. Well, there are two kinds of speed that count here, Mr. Kendall. One is speed at low altitude, and one is speed at high altitude. The extreme speed of the B-70, mach 3, proved not to be of particular use, because the B-70 was limited to the high-altitude, high-speed regime—it could not perform well at all at low altitude. Between the time the B-70 was designed and the time it was canceled, it became clear that over the decade of the sixties and into the seventies, low altitude was the best way to escape being destroyed by ground defenses. I think that is still likely to be true well into the late seventies and perhaps even into the eighties for some part of the geography of air defense.

As I make clear in my statement, however, in the extended air defense area, where there are no ground defenses, but there can be airborne defenses, supersonic speed at high altitude could well be a useful capability and could well be the best means of penetrating that part of the defenses.

My reason for wanting an advanced bomber when we build one, to have the capability to fly supersonic at high altitude as well as being able to fly subsonic or barely sonic at low altitude, is that if you build a bomber of that sort, it is going to be around well through the 1980's, and I am not smart enough to be able to anticipate what the best way to penetrate is going to be at that time. Therefore, I want to build into the aircraft the flexibility to be able to penetrate high in circumstances where that's the best way to penetrate and supersonic if high is the best way; or to be able to penetrate subsonically at low altitude in circumstances where that's the best way to penetrate.

GENERAL MCCONNELL RECOMMENDED AMSA CONTRACT DEFINITION
2 YEARS AGO

Mr. KENDALL. General McConnell, how serious in your mind is the delay in going to contract definition on AMSA? At what point in time are we going to be faced with gaps in our bomber capability, or in expensive modification programs to existing bombers in order to cover the gap?

General MCCONNELL. I think we are 2 years behind now, Mr. Kendall. I recommended a contract definition 2 years ago. Every year we get further behind. I think we have got to have something which will guarantee us penetration capability against sophisticated defenses after the 1975 time period. I don't agree with Dr. Enthoven that speed has nothing to do with it, because it has. It has a lot to do with it.

Mr. KENDALL. To get there in 1975, we would have to have started last year.

General MCCONNELL. Yes.

Mr. KENDALL. Thank you, very much.

Mr. Chairman, that is all I have.

FB-111 LACKS RANGE, PAYLOAD, AND SPEED

Senator STENNIS. This is a kind of solemn note to end on. I don't know. I am very much impressed with what you said, General, about your satisfaction with the FB-111. Still you are very anxious to get AMSA moving.

General McCONNELL. Yes, sir. The FB-111 lacks the range, it lacks the payload—and it lacks the speed that I am definitely concerned about after the 1975 time period. Its performance is just not going to be up to what we need then in my opinion. It is what we need in the 1969-75 period to replace the B-52 C-F.

Senator STENNIS. No one knows, of course, but I believe that both sides realize that all-out nuclear war even with missiles alone would be so catastrophic, as you say here, that it is just very, very remote that it would ever occur. I think that accentuates the importance of the bombers. It is a deterrence in a different way. I am not an expert in the field, but I sure wish we could get moving on this. I just don't believe this other plane—the FB-111—would be thought of as a serious threat by the Russians.

Is there any comment?

Senator THURMOND, do you have anything more?

Senator THURMOND. No further questions, thank you, Mr. Chairman.

Senator STENNIS. Do you gentlemen have any more points that you want to make? Sometimes questions provoke a thought in your mind. Is there anything you wish to say?

Secretary BROWN. Only to express our thanks for your courtesy, Mr. Chairman.

Senator STENNIS. Well, you are entitled to all the courtesy we can give you.

Senator THURMOND. Mr. Chairman, could I ask General McConnell one question?

Senator STENNIS. All right, Senator.

CONGRESS HAS PROVIDED ADEQUATE FUNDS FOR WEAPON SYSTEMS

Senator THURMOND. General McConnell, I get very concerned over the policies of our Government at times in not using our full power, seapower and airpower. That's not a matter within your sphere—I realize that. But I was just wondering, within your sphere do you think of anything that the Congress ought to be doing to keep this country prepared and protect the survival of the people of this Nation that we are not doing?

General McCONNELL. Senator, I can't think of anything actually that the Congress has not done. We, in my experience before the Congress, have seldom been denied either the authority or the necessary funds to proceed with weapon systems offensively and defensively which we consider to be necessary.

Sometimes those systems have not been approved. If they are not approved, then I abide by that decision, because I am not the one to make the decision—I am only the one to recommend the decision. After the decision is made, then I support the decision.

I actually don't know of anything that we have asked for in my experience before the Congress that we have not been accorded a

sufficient amount of authority and money to proceed with, provided we reconsider the F-106X.

SOVIETS MAY BE NEAR PARITY IN STRATEGIC POWER BY 1971

Senator THURMOND. I believe the House Armed Services Committee had a study made in which they came up with a conclusion—General Schreiver, General LeMay and others—that by 1971 the Soviets would have a decided advantage on us in nuclear weapons. Did you see that report?

General McCONNELL. Yes sir; I saw that report. The report actually is not credible. Portions of it are credible. Other portions of it are not credible, because they did not have access to the intelligence information which is required in order to make a credible report of that nature. They did not have access to the plans and capabilities which the Department of Defense has in order to correct those deficiencies. I think that in 1971 the Soviets will be very nearly on a parity, but not quite. And if we proceed now to do some of the things which we have indicated are in the program, then I think that we can continue to maintain a favorable position.

Senator THURMOND. Wouldn't it be dangerous not to proceed to stay ahead of the Soviets?

General McCONNELL. I think we should proceed.

U.S.S.R. PROGRESSING IN SUBMARINE AND AIRCRAFT TECHNOLOGY

Senator THURMOND. We have had testimony here about submarines and how much faster they are building submarines than we are. I believe we had a picture in the Armed Services Committee of nine new planes that they have. We don't have any except the TFX, I believe.

General McCONNELL. Some of the new planes are estimated to become operational—the others are just prototypes which may lead to operational aircraft.

Senator THURMOND. At any rate, they seem to be forging ahead in every field. It is my opinion that they are going to continue to do that. I think we have got to stay ahead of them. If we don't, we are just really in trouble.

General McCONNELL. I agree, sir.

Senator THURMOND. Thank you, Mr. Chairman.

Senator STENNIS. All right, thank you.

General Nazzaro, we are glad to have you here today, sir. I believe it is the first time we have had the privilege of having you in. I hope it is not the last.

General Nazzaro. Thank you, sir.

Senator STENNIS. I hope things are going well with you out there. Over on another subcommittee, years ago, we put a lot in the ground and gave you a lot of ground space down under there. As I understood you, you said that we do not have [deleted]. Just what was that? You said we had less and less damage limiting capacity.

U.S. DAMAGE LIMITING CAPABILITY DECLINES AS SOVIET OFFENSE GROWS

General NAZZARO. I said, sir, that as their offensive inventory grows, naturally the capability we have, the number of weapons we have will apply against them, although it enables us to do this assured destruction part, it does not enable us to do as good a job in the damage limiting role.

Senator STENNIS. For what reasons?

General NAZZARO. Because they are growing in numbers of weapons and we are standing still at the moment.

Senator STENNIS. That's what I thought you would say. But didn't you make the statement when you covered that point before that we do not have enough weapons to apply to all the Soviet targets? Didn't you say something like that?

General NAZZARO. I don't recall making the statement like that.

Senator STENNIS. Mr. Kendall says you specified [deleted].

General NAZZARO. Yes, sir. That's what I meant by damage limiting. As they get more and more offensive weapons, our damage limiting capability decreases.

Senator STENNIS. [Deleted.]

General NAZZARO. That is right, sir.

Senator STENNIS. Has that developed, say, in the last 2 or 3 years?

General NAZZARO. [Deleted.]

Senator STENNIS. Well the only answer to that, then, would be increased capacity to cover increased targets; is that right?

General NAZZARO. If we want to retain a damage limiting capability; yes, sir.

Senator STENNIS. As I see it, nothing could more clearly illustrate what you need. Do you want to comment on that any further or on any of the other points involved here?

General NAZZARO. No, sir. I think General McConnell covered it, Secretary Brown covered it, and I have.

Senator STENNIS. All right.

Is there anything else, gentlemen?

AIR FORCE ACTIVITY IN SPACE

Senator SYMINGTON. I would ask a question, Mr. Chairman.

General McConnell, one thing that worries me a lot about this whole presentation is the past history. Without being redundant, I can remember the development of planes in the past, new hope incident to new concepts around the F-108, then the scrapping of that plane because of the B-70, then the scrapping of the latter because the RS-70 was preferred, then the scrapping of that because of what the B-52 could do with the SKYBOLT; then the scrapping of the SKYBOLT.

The SKYBOLT had a range twice as long as the HOUND DOG, and was ballistic instead of air breathing.

About that time we got into AMSA, and have been fooling around with it ever since, fooling around and fooling around and fooling around, never coming up with any contract definition. I placed the order for the first B-52 myself, in June of 1946. We are now talking about using that obsolete old plane over 30 years later.

One of the best thinkers in uniform or out was General Tommy White. At his retirement as Chief of Staff he made a short talk, stating:

There was a time once when the people who controlled the known ground of the earth, controlled the world. Then the people who controlled the sea, controlled the world. Today people who control the air control the world, and I predict to you tomorrow that those who control space will control the world.

This testimony is casual in its treatment of FOBS. General White also said, "If you cancel the DYNA-SOAR, you cancel the Air Force." I am not saying he was entirely right, but that is what he said. Then we canceled the DYNA-SOAR. Now we have MOL. It took quite a little discussion to prevent an amendment, offered on the floor of the Senate, a few days ago, to eliminate MOL—it almost came up.

It seems to me we are planning to go back to the earth, the ground. In this new air power concept, instead of trying to work anything out at altitude, we now plan heavy supersonic effort just a few feet off the ground.

With these premises, what is the future of space from a military standpoint? Is it important? Is MOL important? Does FOBS show we have neglected, regardless of whose fault, developing a military weapon in space, because of some syllogistic thinking? Are we going to pass space over to the Soviets? If not, what plans do we have to prevent such an occurrence?

General McCONNELL. Let me answer the question in two parts. In the first place, as you know the Air Force is extremely active in space—not from the standpoint of the application of military weapons—although as you also know, we do have a slight capability in terms of capacity to find and destroy a satellite.

MOL is extremely important to the Air Force. I do think that we made a mistake in not developing a weapon system which we could use in space, such as the one that you have mentioned. However, if I had gone about it, I would not have developed a FOBS, because it does not have the accuracy that is required. As soon as we get a capability to detect it when it is launched, then we won't have the capability to destroy it; but we will have the capability to evade it—except for appreciable destruction of population centers.

I think we are putting as much emphasis on space, Senator, as we can with the money that's available to us. I anticipate that we will continue to place appropriate emphasis on space. I am inclined to agree with General White that in the far distant future if we go to military usages of space, and this is way down the road in my opinion, that he probably will be right.

Senator SYMINGTON. Thank you.

Mr. Secretary, is there anything you would like to add to that?

DEFENSE BUDGET FOR SPACE NEAR \$2 BILLION

Secretary BROWN. Only that the space budget of the Defense Department, of which the Air Force has the lion's share—as you know, this is an area that has been specifically assigned to the Air Force—is approaching \$2 billion this year. MOL included, we are covering to some degree every possible use that we can think of for space, and that by concentrating on useful functions in space, I think we have put together a viable space program, one that is not subject to the

vicissitudes which will always be impressed on programs put together without specific and useful ends.

Senator SYMINGTON. Well, I would make one comment. Time and time again we hear the same story—yes, the Russians do have it, and are flying it. We don't know too much about it; but what we have on the drawing board is going to be much better. That today is the situation in MOL, and that today is the situation in fighters, and that today would also appear to be the situation in other weaponry. We spend all this money but don't seem to get any hardware; just a lot of gadgets. Again, that famous remark—"You cannot fly blueprints." If we are spending \$2 billion a year on military space, no member of this committee knows what it's for.

General Nazzaro, in your statement you ad libbed a bit. I was very interested in the ad libbing. You say on page 25, [deleted]. The hour is late. I followed you to the best of my ability. You made a statement not in the written statement. Would you supply for the record in more detail what you meant?

General NAZZARO. I will, Senator.

(The information follows:)

By this I mean that our damage-limiting capability is decreasing because, while their forces appear to be increasing, ours are not [deleted].

\$600 MILLION FOR MOL IN FISCAL YEAR 1969 BUDGET

Senator STENNIS. Mr. Secretary, you said that the space budget, including MOL, for the military is about \$2 billion.

Secretary BROWN. That is right, Mr. Chairman.

General McCONNELL. Mr. Chairman, may we go off the record for a minute?

Senator STENNIS. Yes.

(Discussion off the record.)

Senator STENNIS. Back on the record. The authorization bill for fiscal year 1969 carried the MOL in it. The total projected cost of the MOL was about \$2.4 billion, as I remember. But there wasn't any large sum in this year for MOL. What was it this year?

Secretary BROWN. It is \$600 million in fiscal 1969 budget.

Senator STENNIS. I thought \$400 million. But that would leave \$1.6 billion.

Secretary BROWN. \$1.4 billion for other space.

Senator STENNIS. Your figures are rounded out to about \$2 billion.

Secretary BROWN. I think that's about right, Mr. Chairman.

Senator STENNIS. All right, gentlemen. I'm glad you got back, Senator.

Senator SYMINGTON. Thank you, Mr. Chairman.

DISCUSSION OF FOBS AND MOBS

Senator STENNIS. I have something, too, about FOBS that I was going to ask you, but I think you have about covered it. As I remember, Mr. McNamara issued a statement that there wasn't much to it and that it didn't have any particular meaning. I am talking about the Soviet FOBS now, as I understand it. You say, General, [deleted] that you could—

General McCONNELL. [Deleted], we won't be any worse off with FOBS than we were with other missiles. [Deleted.]

Senator SYMINGTON. As I understand it, an ICBM goes around about 600 miles up, a FOBS about 100 miles up.

General McCONNELL. That is about right.

Senator SYMINGTON. As I understand, an FOBS can go around more than once.

General McCONNELL. That is an MOBS.

Senator SYMINGTON. It is not too difficult to make an MOBS out of an FOBS; is it?

General McCONNELL. No, sir.

Senator SYMINGTON. If you detect an FOBS, and they decide they will send it around two or three times, are you going to start a war because you don't know whether it is an FOBS or an MOBS or something harmless?

General McCONNELL. No, sir; I don't think you are going to.

Senator SYMINGTON. I am only repeating what informed people have commented about. If an FOBS goes around the earth more than once and then comes down on you, at what point would you decide it was a weapon?

General McCONNELL. Senator Symington, may I give you my perspective? If they are stupid enough to put two or three or four of these things up there, and bring them down as weapons, then that's one thing. We would not suffer too much damage until we found out about it. If they are really going to attack us with those types of weapons, they are going to have to put them up in considerable numbers. It would be my opinion that if they started putting those things up in considerable numbers—a lot more than the numbers of satellites that they are putting up in order to do us any real damage, any unacceptable damage, then we would figure they had some sort of a weapons system.

Senator SYMINGTON. Suppose they did put up two. Don't you think there would be a major psychological reaction around the world?

General McCONNELL. If they put up two, it would be a psychological factor.

Senator SYMINGTON. Suppose they put up two but said it was not a weapons system?

General McCONNELL. Well, they may be doing that.

Senator SYMINGTON. Thank you, Mr. Chairman.

AIR FORCE COOPERATION WITH NASA IN SPACE PROGRAM

Senator STENNIS. What cooperation do you have with NASA? Are those programs coordinated or divided up among you, or what?

General McCONNELL. They are very well coordinated. We don't do anything in my opinion that duplicates NASA, and they don't do anything that duplicates us. We get a lot of information from one another. The Air Force has about 200 officers working for NASA. An Air Force general officer is the Program Director of the APOLLO program itself. I think we have a very close relationship with them. We use their laboratories and they use our laboratories.

Senator STENNIS. Do you have a representative there who keeps up with it?

General McCONNELL. Yes, sir. I have 200 officers in NASA and a lot of them in responsible positions, up at the top.

Senator STENNIS. Representing you?

General McCONNELL. No; they work for NASA, NASA pays for them. But it gives us a very close relationship with them. We always know what they are doing. I see them every week.

Senator STENNIS. Are they under your jurisdiction?

General McCONNELL. No, sir; they belong to Mr. Webb.

Senator STENNIS. Well, I thought you ought to have some contact besides that—someone primarily responsible to you.

General McCONNELL. We do. We have in my office a Space Directorate, and it is their responsibility to do the necessary liaison with NASA to see that we are kept together.

Senator STENNIS. All right.

Thank you very much, gentlemen. We appreciate your being here.

We will recess now until 10 o'clock tomorrow morning.

(Whereupon at 5:20 p.m., the subcommittee took a recess until 10 a.m., Wednesday, May 1, 1968.)

STATUS OF U.S. STRATEGIC POWER

WEDNESDAY, MAY 1, 1968

U.S. SENATE,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE
OF THE COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee (composed of Senators Stennis, chairman, Symington, Jackson, Cannon, Byrd of West Virginia, Smith, Thurmond, and Miller) met, pursuant to recess, at 10 a.m., in room 224, Old Senate Office Building, Senator John Stennis presiding.

Present: Senators Stennis, Thurmond, and Miller.

Also present: Senators Curtis, Byrd of Virginia, and Dominick. James T. Kendall, Chief Counsel; Everette L. Harper, Professional Staff Member.

CHAIRMAN'S OPENING STATEMENT

Senator STENNIS. The subcommittee will come to order. The Chair has a brief opening statement.

We continue our hearings this morning on the posture of our strategic forces and our plans for providing for the Nation's future security against nuclear attack.

As these hearings have progressed, it has become increasingly clear that the policy of the United States is to counter the buildup in numbers of Soviet ICBM's and other strategic weapons by improving the quality of our own strategic forces.

With the very survival of our country depending on the quality of the weapons they produce and on their ability to outthink and outperform the Soviets on the technological battlefield, this puts an enormous responsibility on our scientists and the policymakers who guide their efforts. In a very real sense they are in the frontlines of the strategic cold war.

In our hearings thus far we have discussed the threat and top-level policymaking in the strategic field. Since research and development and the timely acquisition of weapon systems play such a vital role in the maintenance of the strategic margin of safety that provides our shield from nuclear attack, it seems appropriate that we examine those functions in some detail.

Today we are pleased to have with us Gen. James Ferguson, Commander of Air Force Systems Command; and Lt. Gen. Joseph R. Holzapple, Air Force Deputy Chief of Staff for Research and Development. We welcome you, gentlemen, and appreciate the contribution which I know you will make to our understanding of these matters.

Now, just one word by way of review. I want to specially direct the staff's attention to my question late yesterday afternoon about the estimated cost of AMSA and the follow-on ICBM and the other items that are listed in that question. I think the request ought to be put in a letter addressed to Secretary of Defense for an early answer. I want a copy of the answer given to me when it comes.

All right. You have a prepared statement that you were very thoughtful to send to us in time to be looked over.

Gentlemen, do you wish to testify together or do you have—do you both have a statement?

General HOLZAPPLE. Mr. Chairman, General Ferguson's statement addresses all of our development activities in support of the strategic forces.

STATEMENT OF GEN. JAMES FERGUSON, COMMANDER, AIR FORCE SYSTEMS COMMAND; ACCOMPANIED BY LT. GEN. JOSEPH R. HOLZAPPLE, DEPUTY CHIEF OF STAFF, R. & D. HEADQUARTERS, U.S. AIR FORCE; LT. COL. WILLIAM DUNN, HEADQUARTERS AIR FORCE SYSTEMS COMMAND; AND LT. COL. ART BARONDES, DSC/R. & D., HEADQUARTERS, U.S. AIR FORCE

Senator STENNIS. Gentlemen, I notice the fine exhibits you have attached to your statement. To put all of those in the record and have them reproduced by the Printing Office, if this is ever printed, would be quite costly. I will reserve judgment on whether these exhibits go in the reporter's record or not. For the time being, I will rule that they are to be excluded and the staff can look that over.

I find that—

Senator MILLER. Mr. Chairman, excluded from the printed but made a part of the permanent record.

Senator STENNIS. They will be in our record and in the files. However, for the time being, they are excluded from the reporter's record and from the printed record.

I believe that we can save almost enough in the course of a year to buy a new bomber or a new system or two by holding down expenses at the Printing Office and elsewhere.

All right, General. Do you want to read all of your statement?

General FERGUSON. Mr. Chairman, it is your pleasure. I would recommend if the committee has the time that I read the full statement because it includes some films and slides that I think will be useful, important, and informative.

Senator STENNIS. Well, I am sure it will.

General FERGUSON. I think it will help to answer some of the questions that the committee has raised in previous meetings; and so, if you will permit me, I will go ahead and read the whole statement.

Senator STENNIS. Well, we certainly do not want to put any limitations on you.

Senator THURMOND. He has his films all the way through.

Senator STENNIS. I see here you have got the films scattered all the way through it. All right. We will start. Senators do not have any more time in a day than a fieldhand; that is, 24 hours, and we have a

lot to do. Everybody is interested in your testimony. They would all be here if they did not have very demanding duties elsewhere. All right. You proceed and let us see how time runs and how long it takes.

General FERGUSON. Thank you, Mr. Chairman.

During my years in Washington, I have been privileged to appear before Members of the Congress on a number of occasions; and, in most of these instances, it has been my function to report on the status of aerospace research and development progress and for the concern demonstrated by this subcommittee in assuring the continued viability of our national strategic posture.

In order to make these hearings as meaningful as possible for this committee, General Holzapple, our Deputy Chief of Staff for Research and Development, who is well known to you gentlemen, has accompanied me today. My statement will, therefore, perform double duty in that it will cover portions of General Holzapple's area of responsibility—that of keeping the Air Force research and development program aligned with the many needs of our operational forces—as well as my own responsibility in Air Force Systems Command.

Briefly stated, the mission of the Air Force Systems Command is to advance aerospace technology, to apply this technology to the design and testing of new weapon systems and equipment, and then to acquire these complete weapon systems and equipment for the operational inventory. We must do these things, of course, on a timely and economical basis.

I will concentrate today on the technical characteristics of Air Force systems and the research and development needed to make future systems qualitatively superior. I will not discuss our force structure or strategic readiness which has been covered by other witnesses.

We began the last decade in 1958 with a strategic force composed solely of manned bombers. We still have a substantial force of B-52's and B-58's, and this deterrent force has been significantly improved through the addition of better avionics, more sophisticated penetration aids, structural strengthening, and improved weapons. In addition, advances such as our airborne command posts [deleted] greatly reduce the vulnerability of our aircraft command and control systems to surprise attack.

The development of the intermediate and intercontinental ballistic missiles introduced a new element into our strategic force. During the early years of this decade, the ATLAS and TITAN I and the smaller THOR and JUPITER missiles added substantially to our strategic deterrent.

These first generation ballistic missiles were quickly followed by the more sophisticated ICBM's—TITAN II and MINUTEMAN. The TITAN II, still in the operational inventory, became the "big bang" missile with its [deleted] warhead.

In this early time period, we also developed and deployed penetration aids [deleted]. These were designed to provide false targets to possible defense systems which were not evident at that time, but which we felt might be deployed during the TITAN II's operational life. As we now know, the Soviet ABM (antiballistic missile) threat is evolving. To counter the threat of increasing enemy accuracies, we

developed and acquired the capability to launch missiles directly from underground silos, thereby reducing missile "exposure" and reaction time.

After successfully advancing the technology of large solid fuel rockets, the Air Force developed the MINUTEMAN I missile, which entered the inventory in 1962. The hardened underground silo deployment, continuous alert posture, and fast reaction launch capability of this first MINUTEMAN system represented significant advances in our strategic forces over the "soft" liquid-fueled Soviet ICBM's of that time.

Prior advances in ballistic missile technologies provided the building blocks on which we based the improvements of our next missile, the MINUTEMAN II. With its newer guidance system, MINUTEMAN II can be selectively targeted to one of [deleted] targets rather than being restricted to [deleted] as in earlier missiles. In addition, the guidance system has been modified to make it less vulnerable [deleted]. By virtue of a number of design improvements in the missile, its silo, and its launch control center, MINUTEMAN II enjoys greater nuclear survivability both in place and in flight. Finally, range and throw weight have been increased and the accuracy has been sharpened.

Based on test launches, the circular error probable (CEP) for MINUTEMAN II has proven to be less than [deleted] compared to just under [deleted] for the MINUTEMAN I.

VU-GRAPH 1—[DELETED]

These advances did not come easily. A number of development problems were encountered, primarily in the Minuteman II guidance and control units. [Deleted.]

Anticipating Soviet improvements in their ABM system, we have increased the hardness of our missile warheads and added penetration devices to improve our ability to counter Soviet area defenses.

VU-GRAPH 2—CHAFF PENETRATION AID

[Deleted.]

To provide the re-entry vehicle technology to meet and overcome the threat of the Soviet ABM deployments, we have been conducting for several years the advanced ballistic reentry systems development program known as ABRES. This is a national program managed by the Air Force to improve the penetration capability of the ballistic missile systems through innovations in re-entry system technologies.

VU-GRAPH 3—RE-ENTRY TECHNOLOGY DEVELOPMENT

About half the launch program activity takes place in the western test range and the Kwajalein splash-down area. The other half is accomplished at the Green River, Utah, and White Sands, N.Mex., Missile Range, as indicated on the vu-graph.

The innovations include the design and testing of [deleted] re-entry vehicles and of better penetration aids for the future deployment. [Deleted.] This program is continuing and will be necessary far into the future to cope with the ever-changing strategic threat.

Another area of desired improvements to our strategic posture has been in the warning time available to us.

VU-GRAPH 4—BMEWS

To realize such improvements, we began first with the three sites in the ballistic missile early warning system (BMEWS) which became operational in 1962. As this concept chart illustrates, BMEWS provides for the detection of objects threatening to overfly the North American continent from a northern approach and makes impact predictions for objects on a ballistic path. (The globe in the center of the chart indicates the coverage afforded by the three BMEWS sites.) The warning time available through BMEWS is, of course, unextendable beyond a certain point, since objects must ascend above the horizon to be detected.

In the last 5 years, we have updated the BMEWS capability by adding electronic features for [deleted].

VU-GRAPH 5—OTH-FORWARD SCATTER

One important improvement in our posture has been in early warning.

As a follow-on to BMEWS and to extend the warning time available, the Air Force is presently transitioning a forwardscatter over-the-horizon (OTH) radar [deleted].

VU-GRAPH 6—OTH CONCEPT

For the past [deleted] the efficiency of this system to detect missile launches has been on the order of [deleted] percent, [deleted]. The system works by noting the perturbation of the ionosphere caused when the missile passes through it.

VU-GRAPH 7—FOBS

The term FOBS, of course, applies to a fractional orbit bombardment system. Such a system potentially reduces our warning time since it initially appears as a satellite rather than as a ballistic missile. It may also approach the United States below BMEWS coverage or from the south.

Note that the ballistic missile enters the BMEWS "fan" much earlier in its trajectory and, therefore, we receive earlier warning than we do with northern FOBS trajectories.

The defense of the continental United States against the aircraft or air-breathing missile threat has also been modernized. In 1953 the Air Force inaugurated the SAGE semi-automatic ground environment system. In the intervening years, many technical improvements have been made to SAGE and its supporting interceptor force, including the current backup interceptor control (BUIC) system.

I should also mention our existing satellite surveillance system. The space track system is a complex of sensors and collating techniques to observe and catalog all orbiting objects that may pose a threat to us.

We also have a limited ability to intercept and destroy hostile satellites. [Deleted.]

All these surveillance and defense systems are tied together today by the highly automated, well protected NORAD control center beneath Cheyenne Mountain in Colorado.

The final element in our strategic offensive posture is our ability to control our forces. We have an updated center at the Strategic Air Command, with an elaborate supporting complex of alternate command posts and backup communication systems, including the airborne command posts [deleted].

VU-GRAPH 8—[DELETED]

[Deleted.]

FILM—COMMUNICATION SATELLITES PREPARED FOR LAUNCH

A major contribution to our command and control capability is the introduction of satellite communications. [Show of launch.]

As a result of a series of launches completed last year [show of ejection in orbit], we now have 18 satellites comprising the initial defense communication satellite system. [Show of circle of satellites; show of satellites transmitting.]

This system also provides an emergency capability for transmitting high quality photographs, from Southeast Asia, for example, in minutes rather than days.

This satellite system now provides more reliable DOD communication channels and the flexibility of the medium adds greatly to the potential for reconstituting communication channels in an emergency. This feature continues to be demonstrated whenever our transoceanic cables are broken, as they frequently are.

The systems I have discussed comprise the principal Air Force-developed elements in our current strategic offensive and defensive posture. They are the products of an aggressive technology and clearly meet our national objectives—for 1968.

However, technology is a perishable commodity. Technological leadership can be transient and strategic advantage a temporary possession. As a consequence, we are administering the programs, proposing the projects, and requesting the resources necessary to give the United States increasingly better strategic capabilities in the future.

VU-GRAPH 9—1965-69 STARTERS

This list reflects the principal programs "started" since 1965. These represent some very significant improvements in our defense capabilities, and are indicative of the kinds of advances technologies are making possible.

One way we can anticipate the strategic threat that we may face in the future is to keep abreast of the scientific, technical, and industrial advances being made by foreign powers. To this end, we are making a concerted effort to keep tuned in to Soviet and Chinese technological developments. Our Foreign Technology Division is, in fact, responsible for producing aerospace technical intelligence for the DOD community.

All intelligence indicators clearly show that the Soviet Union places a high national priority on military R. & D. This is apparent from at least three indications:

VU-GRAPH 10—SOVIET S. & T. MANPOWER

First, in the growth and allocation of their scientific and technical manpower. The emphasis they put on scientific and technical education is evident in the numbers of engineers, scientific workers, and holders of advanced degrees in the Soviet Union.

Senator MILLER. Could I ask a question at this point?

Senator STENNIS. Yes, just try to make it brief.

Senator MILLER. I just want to find out whether the 150,000 engineering graduates are of comparable quality to our baccalaureate engineering graduates in this country.

General FERGUSON. It is a little difficult to answer the question directly, Senator Miller, but certainly they are producing great numbers of them after graduation from college, they go right into laboratories and assignments that have great scientific and technical challenge. They will meet our competence, if not on the day of graduation, perhaps 2 years after.

Senator STENNIS. That is the very question I had in mind. I think it is a good question. Unless you can give us a comparison, figures do not mean too much, General. But, go ahead. I do not mean to stop on that any more. We will come back to that.

General FERGUSON. All right, sir.

Second, in their budgets for military R.D.T. & E. and space expenditures, which have been climbing steadily over the past 10 years. Of particular interest are the comparative funding trends since 1964.

These two are a matter of congressional record and I need not elaborate on them now. I will add, parenthetically, however, my firm belief that between two societies with generally comparable technologies in the broadest sense, the one which devotes more money and skilled manpower to a given problem will almost certainly solve it faster than the other.

The third indication of Soviet technological aggressiveness is in their test facilities—the tangible and essential means of translating technology, manpower, and expenditures into completed weaponry.

The general trend in Soviet aerospace facilities has been one of immense growth in research institutes, design bureaus, wind tunnels, missile and space test facilities, and test ranges. I will cover these facilities and their implications later in connection with our own facility needs.

Suffice it to say here that the military research and development efforts of the Soviets must be considered equal to those of the West in many areas. The visible products of these efforts—most notably, new missiles and aircraft—have been displayed in increasing numbers during the past several years and represent the potential near-term threat.

However, if we are going to serve this Nation's future strategic posture, we must focus now on the concepts and the technologies not only of tomorrow but of the day after tomorrow—into the next decade and beyond.

VU-GRAPH 12—"BATHTUB"

Unfortunately, as you have observed from previous testimony, there is considerable difficulty in obtaining intelligence on Soviet R. & D. projects during that phase occurring between applied research and full-scale development and test. It is precisely in this period when the Soviets could be laying a broad technological base leading to surprises in strategic weapons tomorrow. Innovations [deleted] have by no means been exhausted. Furthermore, as this chart illustrates, developments in these areas are far from obvious [deleted].

In the meantime, we are sensitive to the threat inherent in the Soviet potential [deleted]. In fact, we have reason to believe that the Soviet Union is pursuing technological programs in all the known areas of strategic weapon improvement. We must be prepared to preempt or at least to meet these improvements in Soviet capabilities.

VU-GRAPH 13—SOVIET SURPRISES

These next charts represent a case study in Soviet developments. In 1963, testimony before Congress indicated that the Soviets could do the things shown here, but they could not carry out all these programs at the same time.

VU-GRAPH 14—SOVIET SURPRISES (OVERLAY)

However, we have since seen that Soviets have allocated resources to all the goals indicated at the top of this chart, plus all the additional programs listed below the blue line. I do not mean to imply that they may not have made mistakes in supporting some of these programs—the point is they have demonstrated the will to pursue them all.

But, neither our awareness nor the counterpreparations underway afford an ironclad assurance against a technological breakthrough or an unforeseen payoff to a bold risk venture by the Soviets. They have surprised us before. They are well equipped today to do so again.

Let me say just a word here about the threat from Communist China. We do not underestimate this threat, although they lag the Soviet capability at the strategic level. The Chinese are persevering and traditionally clever people—their progress in the development of strategic weaponry, despite chaotic internal conditions, has been remarkable. Their major R. & D. programs seemingly proceed at high priority regardless of the cultural revolution. We will continue to watch developments there very closely.

With this appraisal of the technological threat as background, I turn now to a summary examination of our Air Force programs which are aimed toward the qualitative strategic advantage of the United States over our enemies. I will include comments on our bomber, missile, surveillance and warning, and aircraft defense systems.

First, however, I will comment on the R.D.T. & E. funding that makes these programs possible.

VU-GRAPH 15—AF SOUTHEAST ASIA R.D.T. & E.

The considerable concern for U.S. limited war capabilities expressed in Systems Command activities during recent years—legiti-

mate though that concern may be—has nevertheless consumed resources which might otherwise have been applied in some part to the improvement of our strategic posture. (From zero in 1965, the funding for Southeast Asia has climbed to \$151 million in the fiscal year 1969 request.) This is R. & D. money—

Senator STENNIS. Just a minute. Did you have a line item in the bill for Southeast Asia research and development, solely?

General FERGUSON. No. It is broken out into a number of line items.

Senator STENNIS. Just a minute. Let me finish my question, please. Did you have a line item in the bill or an explanation of the cost of research and development limited solely to Southeast Asia problems? I remember some mention about some weapons but—

General FERGUSON. General Holzapple has been describing this. If he may—

Senator STENNIS. Quite briefly.

General HOLZAPPLE. Mr. Chairman, this \$151 million figure is somewhat arbitrary. It is associated with those R. & D. projects that we can clearly identify as being specifically for Southeast Asia.

Senator STENNIS. That gets it. I thought that is what it was. And, it is very timely that you do that.

Senator THURMOND. What is the number of this vu-graph?

General FERGUSON. No. 15. It is on your handout.

Senator THURMOND. That same picture is not on here. I want to know if you have got a number on that—corresponding.

General FERGUSON. I think it is attached to the back. Copies of all the slides are attached.

Senator THURMOND. Go ahead.

Senator MILLER. Did you say Army research, General Holzapple?

General HOLZAPPLE. No. Air Force research. It is chart 15.

Senator STENNIS. All right.

General FERGUSON. Insofar as possible, the impact of Southeast Asian needs on our future strategic posture is being minimized; and you can see in terms of total dollars that impact is small. At first glance, the total funds made available for research, development, test, and evaluation appear to have increased slightly since fiscal year 1965. However, the lower total line on the chart translates current funding into 1964 equivalent dollars. So you can see that reduced buying power and the added Southeast Asia expenditures have combined to make the dollars available almost static in these vital areas. Fortunately, limited war and strategic technologies are not mutually exclusive: some developments, such as [deleted] and materials given impetus by limited war needs, are demonstrating potentials for strategic uses.

Now to return to our programs in the manned bomber area, we are developing the new short-range attack missile (SRAM) for use on the FB-111 and follow-on aircraft systems. We also have approval to modify [deleted] B-52H's for SRAM carriage.

VU-GRAPH 17—SRAM MISSION

The SRAM can be employed as a penetration aid for use in destroying surface-to-air missile sites or as a stand-off weapon for attacking primary targets. The SRAM adds to our flexibility [deleted].

[Deleted] SRAM missiles can be mounted [deleted] in the bomb bay of a B-52. [Deleted] more can be mounted on pylons under the wings.

[Deleted.]

In fiscal year 1969 we will begin adding a crypto-secure IFF feature to the B-52 fleet to alleviate the aircraft identification problem. The system is designed to provide secure, positive identification of our own aircraft to NORAD defense forces and thus facilitate their safe passage into and out of the CONUS.

Our current strategic bomber forces will be augmented and updated by the addition of the FB-111 aircraft. The prototype for this bomber version of the variable sweep wing F-111A was flown last July and the procurement schedule calls for deliveries of [deleted] aircraft between now and 1971.

The primary mission envisioned for the FB-111 is the nuclear delivery of [deleted]. The penetration effectiveness of the FB-111 will be enhanced by its higher speed, lower radar profile, and terrain-following features.

Beyond the FB-111, we in the Systems Command, are convinced that the Air Force needs a new advanced bomber for the mid-seventies. We need a superior penetrator which will exploit higher speed and longer range on the deck, coupled with an even lower radar cross section. We are continuing to prepare for such an advanced bomber in two ways:

First, we are pursuing advanced development programs in the contributory areas of avionics and propulsion—the two long leadtime items which are critical for any new aircraft.

Second, we are continuing earlier design work in some detail on the bomber itself, an effort which will contribute materially to a successful engineering development.

Through our development of an AMSA demonstrator engine, we know that we can achieve a significant improvement in performance and specific fuel consumption—this means that an AMSA, in comparison to existing bombers, could start its low-altitude penetration earlier and fly deeper into heavily defended regions. These same engines would also operate efficiently at high altitude and supersonic speeds. We would take advantage of our progress in structural materials to make a lighter, stronger airframe capable of withstanding the destructive stresses of high-speed, low-altitude flight. The combination of these two factors alone will permit us to design and build a bomber, tailored to the environment of the seventies, with a gross weight some [deleted] than that of a B-52.

While this reduction in weight, coupled with the swing-wing technology of the FB-111, would facilitate short field operations on a global basis—thereby permitting a widely dispersed force—the real advantage comes in getting to the assigned targets. [Deleted.]

These are just a few of the substantial advantages that lead us to believe that the AMSA would be in extremely effective deterrent with a major assured destruction capability. In a conventional bombing role (similar to today's operations in Southeast Asia) the AMSA would also offer major advantages.

In a related effort to enhance the penetration of both our existing and planned bomber forces, we are examining the utility of developing an improved tanker. Possibly, by adapting the new C-5 transport, we can provide full fuel loads to the bombers just before they enter hostile airspace to extend their low altitude penetration range.

In talking about current and near-term aircraft programs, I want to emphasize the importance of electronic countermeasures (ECM) to the improvement of our penetration and survival capabilities. Some highly significant progress is taking place today in the ECM area, for both tactical and strategic missions. More is being accomplished during the original design of the weapon system to [deleted]. Engineering at this point is relatively cheap compared to the high costs of ECM equipment that must be added at a later date to insure survivability. [Deleted.] Since ECM are always developed in reaction to a potential or actual threat, we are always in a see-saw situation of intense competition with our enemies to see who can "out-black-box" the other.

In the missile area, a number of technological improvements are underway.

VU-GRAPH 19—MINUTEMAN FAMILY CHARACTERISTICS

MINUTEMAN III is almost an entirely new missile system, having a new third-stage, a post-boost propulsion vehicle and a new guidance. As this comparison chart shows, it promises significant improvements in the accuracy, flexibility, and penetrability of our ICBM force.

FILM MINUTEMAN III SILHOUETTE (ANIMATION) THIRD STAGE

The Minuteman III, with its larger stage, means greater payload and range.

PBCS—LIVE SCENE

Its post-boost control system contains all the guidance and control components needed to program the MIRV's multiple independently targetable reentry vehicles (MIRV's), together with the accurate dispensing of decoys and chaff.

ANIMATION—TARGETS, DECOYS, CHAFF

These will degrade the Soviet defense effectiveness by providing a large number of threat objects accompanying the reentry vehicles.

[Deleted] separation.

[Deleted.]

MIRV—COMPONENTS

For a sample mission, assume that the combination of payload components consists of—

Warheads.

[Deleted.]

Decoys.

[Deleted.]

Chaff.

[Deleted.]

MINUTEMAN III—SILO-LAUNCH

The MINUTEMAN missile, equipped with the MK 12 [deleted] is launched from its underground silo.

Pitch: In flight, the MINUTEMAN pitches over to the programed trajectory.

First stage: After first stage burnout.

Second stage and second stage ignition.

Shroud separates: The shroud separates.

Second-stage burnout; third stage:

Following the second stage burnout, the third stage carries the payload vehicle to the point in the trajectory where the deployment sequence begins.

[Deleted.]

The ABRES technology program—which I mentioned earlier—is providing the materials and design technology for a variety of promising re-entry systems and their penetration aids. [Deleted.]

The missiles themselves, of course, are only one part of a ballistic missile system. That system includes the silo, launch facilities, and launch control center. While the survivability of the MINUTEMAN force in the silos has been steadily increasing, we are now expecting to make a significant improvement in this area through the development of the dual capable superhardened silo.

VU-GRAPH 20—HARD [DELETED] SILO

We anticipate contract definition in fiscal 1969 on this silo concept, which calls for [deleted] implacements to attain hardness levels of [deleted] p.s.i. for the silos and [deleted] p.s.i. for the control centers.

The term "dual capable" refers to our proposal to design the silos to accommodate the MINUTEMAN III and, later, any follow-on system such as the advanced ICBM [deleted].

This future weapon system would provide a substantial increase in throw weight over the MINUTEMAN III. Coupled to this benefit, would be advances in reentry vehicle technology which would permit additional MIRV's, more pen aids, or combination of both. We are currently pursuing supporting technology programs, pointed toward early contract definition.

As part of our continuing program to evaluate the present in-silo hardness of the MINUTEMAN system, we have devised and conducted [deleted] tests which stimulate nuclear explosive effects.

FILM—[DELETED]

Film—HEST test preparations: To simulate the long-duration blast overpressure on a silo or a launch control center, we have constructed one-time test areas 300 by 300 feet on top of the operational facility to be tested.

Primacord: We filled the area with racks containing 75 miles of woven primacord (containing 16 tons of high explosives).

Earth covering: Which are then covered with some 45,000 tons of earth.

Instrumentation: The entire area was carefully instrumented.

Explosion: To measure the effects of the detonation.

FILM—TEST PREPARATION

Last fall, for example, we conducted this demonstration test on a MINUTEMAN facility. For this test we used about 400 miles of primacord (equivalent to 85 tons of H.E.).

Explosion: This detonation moved 300,000 tons of earth 300 feet into the air. Through these tests we have subjected operational silos to [deleted] overpressure and control centers to [deleted].

We intend to continue these tests since they are vital to understanding our present capabilities and to provide design parameters for the future.

VU-GRAPH 21—(ALCC)

To further hedge against the loss of our launch control centers, we have transformed C-135 aircraft into airborne launch control centers.

These control centers are capable of launching MINUTEMAN missiles from the air if the underground control centers are neutralized.

Preliminary design work has been funded for an advanced airborne command post which would include the [deleted] as well as launching MINUTEMAN from the air. This system may be incorporated in a C-5-type aircraft and would have extensive communication and data processing capabilities for control of the bomber fleet as well.

To provide improved warning against ballistic missile attack, we have both ground-based and space-based systems under development.

Warning against sea-launched ballistic missiles is to be provided by an integrated system of modified SAGE radars, computers, and communications. This system should be operational in [deleted].

To provide detection and warning of an airbreathing attack, we are planning to carry out experimental tests on a [deleted] backscatter radar suitable for detecting and tracking aircraft beyond the horizon. [Deleted.]

VU-GRAPH 23—OTH-B

The Air Force is currently considering a follow-on operational over-the-horizon radar system to provide warning and to track enemy aircraft attacking the CONUS. These radars will reach out some [deleted] as this coverage chart illustrates.

The other parts of the CONUS aircraft defense complex that we are planning consist of an improved interceptor and an airborne warning and control system (AWACS).

The improved interceptor will be equipped with an advanced fire control and missile system with a look-down, shoot-down capability against low-flying targets.

The advanced missile control and radar system planned for installation in the improved interceptor is expected to detect targets within [deleted] to detect and track targets in clutter [deleted] to provide air-to-air missile guidance and control for intercept in the presence of ground clutter, [deleted].

To enhance target kill probabilities we are planning an improved air to air missile [deleted].

Controlling the interceptor force will be a new airborne warning and control system (AWACS). Made feasible by recent achievements in overland radar technologies that enable us to detect low flying aircraft from above against ground clutter, AWACS aircraft will be available to ADC in [deleted].

I have been describing next generation systems—those whose performance characteristics, costs, and schedules, are near enough in the future for reasonable estimates and definitive program actions. We must, of course, look beyond the next generation to the time period 10 to 20 years ahead. We do not know what the new systems of that time will actually look like, but our responsibility now is to prepare the technology base so that, when the time comes, we will be ready to design and to acquire those systems.

This technology base can only come from an imaginative and vigorous R. & D. program in the exploratory and advanced development areas.

The variety offered by our R. & D. programs and projects borders on the infinite. Work is going on in "super" materials technology (boron composites, metals, and plastics); in fuels, both conventional and exotic; in new aerodynamic shapes and control concepts; in high temperature jet and advanced ramjet engines; in life support systems for both atmospheric and outer space environments; in highly efficient power conversion schemes for satellites and space vehicles; in electronics and computers—the list is endless. Breakthroughs (or even continuing success) in developments will provide building blocks for such conceptual far-term system capabilities as the following:

VU-GRAPH 25—[DELETED]

[Deleted.]

VU-GRAPH 26—[DELETED]

Aircraft systems of vastly increased range, payload, and maneuvering capabilities. Current and expected advances in materials, engines and aerodynamic design will permit building considerably advanced military aircraft and could be of particular utility in revolutionizing airlift concepts.

VU-GRAPH 27—CASCADING PROGRESS IN AIRCRAFT PERFORMANCE

Starting today, for example, with the technologies in hand, we could immediately augment aircraft performance by 30 percent by adding new materials and engines to current aircraft. If we then take a little longer to optimize current aircraft design by removing redundant portions and reconfiguring others, we could gain another 30 percent. With somewhat more leadtime we could design and build an entirely new aircraft and capitalize on technological advances to the extent of a 100-percent payoff.

The operating costs per ton-mile of cargo aircraft have been going down over the last few years until they are now competitive with trucks and trains. Within 10 years, they should be competitive with ships. This means that aircraft will be both the fastest and the cheap-

est way to move men and materiel. The total worldwide posture of the United States could be changed when it becomes feasible to move entire Army divisions halfway around the world and close their complete logistics tails within a few days rather than weeks.

Vertical or short takeoff and landing (V/STOL) characteristics could free air defense interceptors and transport aircraft from normal bases and allow them to operate from almost totally primitive landing areas.

And there are many others.

Now, before leaving the subject of future technologies, I want to mention two areas that are specially promising at this time. The first is electronic miniaturization and corollary computer advances. The second is lasers.

VU-GRAPH 28—ELECTRONIC ADVANCES

In electronics, advances in molecular or integrated circuits allow the incorporation of hundreds of circuits on a ceramic wafer the size of a quarter. The transition of this technology into operational subsystems promises major improvements in reliability and performance with lower weights and costs. Improvements in reliability of hundreds of hours, and weight/size reductions of 5 to 1 are very meaningful in airborne applications such as fire control computers, radars, and communication equipment. In the example on the screen, the four "generations" of electronic progress since 1950 are illustrated. The components in each of the squares perform exactly the same functions. So you can see that we have achieved substantial advances which have not only resulted in reduced weight and greater simplicity, but in improved performance and reliability as well, as you look from the left to the right on the chart.

Companion advances in computer technology are beginning to offer microminiaturized ground based computers with half million word memories and logic processing rates of a billion words per second. In airborne applications, such improvements offer potential for new concepts in realtime battle management.

VU-GRAPH 29—CNI

Let me illustrate just one near-term system concept along these lines. It is called CNI, for Communications-Navigation-Identification. As the left hand side of the concept chart indicates, our planes now are overburdened with the "black boxes" needed to perform these functions, plus weapon guidance, air traffic control, and others. By electronically consolidating these functions into one black box, we expect to reduce the volume formerly required for discrete equipment down to approximately 1 cubic foot and the required weights from many hundreds of pounds down to something like 50 pounds. These reductions in size and weight are important to the satellites and aircraft which make up the system.

Aircraft incorporating the terminal equipment could be under continuous air traffic control and could—in all weather, without recourse to conventional ground or air navigation—determine their absolute

position within 600 feet. Military and civilian applications of this concept are obvious. [Deleted.]

[Deleted.]

The second technology area I want to mention is lasers. As research tools, they are already being taken for granted. What is dramatic is the speed with which advances are providing new potential applications.

Laser radars, [deleted].

Laser communication techniques [deleted].

Laser illuminators [deleted].

VU-GRAPH 30—GAS LASER

[Deleted.]

FILM—LASER TUBE

In the laboratory demonstration, this carbon dioxide laser: Firebrick—burned a hole in a high-grade firebrick in 5 seconds. [Deleted.]

VU-GRAPH 31—LASER APPLICATIONS

Based on our knowledge to date and the technologies already available, we can postulate a number of laser applications, some of which are listed on this chart. [Deleted.]

I have limited this discussion to electronics and lasers; however, I am sure that as time goes on, other new development areas of great promise will come to light. I am sure that you appreciate the necessity—and share my enthusiasm—for an R. & D. program which will continue to build on these technologies.

By way of conclusion, gentlemen, I would like to go back to the matter of the resources needed to get our job done. And I am not referring primarily to people or money, although these are commodities which are admittedly in short supply these days. On that subject I will simply say that we are earnestly endeavoring to derive full value from the personnel and fiscal resources entrusted to us.

However, there are other resources that represent an urgent need for any country committed to a bold and progressive R. & D. program. I am speaking about facilities, and I refer specifically to those large, complex, and often costly aerospace test facilities which form the base for technological incubation. Among these national resources are the vast test ranges, scientific laboratories, environmental chambers, wind tunnels, shock tubes, instrumented aircraft, and computerized analysis centers which permit us to test and evaluate new systems or subsystems under actual or simulated operational conditions.

As I mentioned earlier, the growth of the Soviet facilities indicates a massive investment in their test capabilities. [Deleted.]

Some insight into the significance of these Soviet facilities and the capabilities they foreshadow can be gained by noting some of the aerospace programs they are currently supporting.

These include: Hypersonic aerodynamics research; [deleted] STOL and V/STOL aircraft—such as exhibited at the Moscow airshow last summer—new ICBM and ABM systems; manned lunar and space station programs; [deleted]; and a large space booster with capabilities

exceeding those needed for a manned lunar landing. While these are not directly related to our Air Force strategic mission, they are indicative of the Soviet large-scale system test capability.

[Deleted.]

VU-GRAPH 32—C-5 ENGINE TEST REQUIREMENT (BASIC)

In the air-breathing engine regime, the operational envelope for the TF-39 engine is as shown. In accordance with good engineering practice, the engine should be ground tested throughout the envelope.

VU-GRAPH 33—C-5 ENGINE (U.S. CAPABILITY)

The most capable engine test cell in the free world, which is at our Arnold Center, is nevertheless inadequate for the purpose since it cannot support the mass airflow requirements needed to test the engine in that part of its performance envelope—from sea level to 5,000 feet and more as shown.

VU-GRAPH 34—C-5 ENGINE TEST [DELETED]

[Deleted.]

VU-GRAPH 35, SST ENGINE TEST REQUIREMENT

Equally important is the U.S. SST engine test requirement envelope, represented on this chart.

VU-GRAPH 36—SST ENGINE (U.S. CAPABILITY)

Our capability is approximately as indicated here.

VU-GRAPH 37—SST ENGINE [DELETED]

[Deleted.]

VU-GRAPH 38, V/STOL WIND TUNNEL REQUIREMENTS

We are also hampered in V/STOL development by the lack of a wind tunnel facility big enough or sophisticated enough for testing system-size powered models in the transition from vertical to horizontal flight. No facility available to the United States today has all the necessary elements indicated on this chart.

[Deleted.]

Here in the United States, you will recall that after the Second World War, the Air Force took Dr. von Karman's prescient advice and designed, developed, and built an advanced test facility complex that far exceeded the system requirements of that day. It included, for example, a mach 3 wind tunnel at a time when some scientists contended that aircraft would never break the sound barrier.

These facilities have proven their value over and over again, and in the course of the past 20 years have been greatly augmented and substantially modified. But, I must remind you that the facilities designed in the thirties and built in the forties for the testing needs of the fifties are now reaching the outer limits of usefulness. We have, therefore, arrived at a time when a new departure on a broad front is

not only prudent but necessary to provide the Air Force's potential for progress—and, that of the entire Nation as well.

Because the kinds of facilities I refer to are national resources serving the needs of many Federal agencies, civilian as well as military, I have taken steps to foster an interagency examination of national needs which I hope will lead to an integrated facilities program keyed to the challenge and the opportunities of the future. The tremendous growth and expansion of our strategic force in just 10 short years, from an all-bomber force to a composite aircraft-missile-space force, suggests that we have by no means reached a limit on strategic or tactical innovations. The ability to test new ideas and new technologies may well prove critical to the realization of new dimensions of strategic strength.

Gentlemen, I thank you for your interest in the Air Force Systems Command and your concern for the future contribution on research and development. I assure you that the strategic capabilities of the United States will continue to command a large share of our time, our talents, and our technologies.

Senator STENNIS. Thank you, General. You certainly have a fine statement. I will have some questions later. Gentlemen, I hope it is agreeable with the subcommittee if we let Mr. Kendall, as counsel for the subcommittee, have about 25 or 30 minutes to bring out the chief point that he wants to get to this morning based on the general's presentation. In doing that, you cannot examine each one exhaustively but you can get the major issues out on the table. Then the Senators can have a chance to ask their questions. We will move right along.

SOVIET R. & D. EFFORTS

Mr. KENDALL. Thank you, Mr. Chairman.

General, I was impressed by your stress on what the Soviets are doing in the R. & D. field and the amount of their budget which is devoted to R. & D. I understand this is now about [deleted] percent of ours, is that correct?

General FERGUSON. In 1967 I think the number is [deleted] billion for military R.D.T. & E. and space which is between [deleted] percent of ours, yes.

Mr. KENDALL. What significance do you read into this from the standpoint of whether or not it threatens our position of technological leadership?

General FERGUSON. Well, I think their investment in military research and development and space is, perhaps, only a part of the total significance and if I may, Mr. Chairman, I would like to spend just a minute telling you how we arrived at our conclusion on this question.

Eighteen months ago the Foreign Technology Division of the Systems Command undertook a study to determine what the technological threat was, by examining exhaustively all the information that was available. Very briefly their conclusion, or rather, their findings are these.

First, of all, there is recognition at the top levels of the Soviet Government of the importance of science and technology as an integral part of their achievement of their stated goals. A large number of scientists and engineers are in the top levels of government.

Secondly, they have undertaken a very, very vigorous program of educating their young people in science and technology and it has grown rapidly over the last 20 years.

Thirdly, they have built a great number of science and space and laboratory centers for the purpose of exploring technology.

Next, they have provided these people magnificent large test facilities to test the products of these laboratories, and finally, they have provided a solid funding base.

So, coupling national recognition, a vigorous education program, laboratories and facilities, and rubles results in a great deal over a period of time. In the last few years we have seen the product of that effort in terms of very advanced exploitation in space.

We have seen a number of new aircraft from the very largest transport in the world today to very, very advanced fighter airplanes and everything in between. They have produced and have shown us a whole family of ballistic missiles.

GREATER THROW-WEIGHT OF SOVIET ICBM'S

Mr. KENDALL. As a specific question, do you foresee advances in Soviet technology which will permit them to take advantage of the greater throw-weight in their [deleted] missiles; for example, providing [deleted]?

General FERGUSON. [Deleted.]

Mr. KENDALL. But it is true, is it not, that the larger throw-weight represented by [deleted] gives them greater flexibility for doing such things as [deleted]?

General FERGUSON. It does, indeed.

U.S. REQUIREMENT FOR LARGER ICBM

Mr. KENDALL. Is that the reason you feel there is a requirement that we have an ICBM with a larger throw-weight than our present MINUTEMAN, [deleted] for example?

General FERGUSON. That is one reason; yes.

R. & D. OPTIONS AND INTELLIGENCE LEADTIME

Mr. KENDALL. On the question of their research and development, we have been told by Mr. Helms, the Director of Central Intelligence, that he expects the intelligence community to be able to give us a [deleted] warning time from the detection of a major technological breakthrough by the Soviets until incorporation of it into the operational system.

Now, do you think that our R. & D. options-under-the-shelf concept is fully capable of countering Soviet initiatives and advances in this field or is there danger that we are running a real risk in view of the [deleted] reaction time that we might have?

General FERGUSON. [Deleted.] Their emphasis on facilities and advanced test facilities, I believe, gives them an opportunity to do more of the development out of sight from us so that the testing that is required before it goes into the operational inventory might be

shorter than it is forecast to be today, and, therefore, that makes the problem even more difficult for us.

Mr. KENDALL. How far do you think we ought to go pursuing a matter in R. & D. before we decided we have gone far enough and put it on a shelf as an option?

General FERGUSON. Of course, that will vary with the undertaking. Over the years we have had a fairly vigorous program of technology-developing guidance for systems, engines, and other components that gave us a fairly reasonable response time. Our program is not quite so vigorous in many areas as it was before, so that——

Senator STENNIS. Pardon me, now. You are still talking about this added——

General FERGUSON. Mission. The question was developing sub-systems or technology and then putting it on the shelf to be used when we saw a Soviet threat that required that particular development.

Senator STENNIS. I see. Go ahead.

General FERGUSON. We have been doing work, as you know, on the AMSA, the advanced strategic aircraft, and also some work on [deleted] the advanced ballistic missile, but there is only so much that you can do in terms of component development. There comes the day when you have to put these together to produce an improved capability.

READY TO GO TO CONTRACT DEFINITION ON AMSA

Mr. KENDALL. You mentioned AMSA. What is its status from an R. & D. standpoint, particularly with respect to whether or not we are ready to go to contract definition on it at this time?

General FERGUSON. First of all, let me say we are ready to go to contract definition now. I would like to go on to say that for the last several years we have been studying avionics in detail with six or seven contractors. We've had systems studies by two large aircraft manufacturers, and we have demonstrated engines developed by both General Electric and Pratt & Whitney, and we have had a number of universities that have been working on this program. To date we have spent around \$120 million for these efforts aimed toward producing an AMSA.

I think previous witnesses have given you the operational concept and the performance parameters that we are looking for. We have, to date, demonstrated a propulsion cycle; that is, an engine of the size and performance we are looking for. We have selected the design criteria. We have demonstrated the advanced avionics that are required; that is, navigation and the countermeasures.

The plan for contract definition is completed and we have established credible designs.

DISAPPROVAL DELAYS AMSA FOR AT LEAST 1 YEAR

Mr. KENDALL. Well, there was disapproval of the proposal to go to contract definition in fiscal year 1969. Will ultimate production and deployment of AMSA slip by 1 year as a result of this?

General FERGUSON. That is my estimate; yes, sir.

"NEXT LOGICAL STEP" ON AMSA IS CONTRACT DEFINITION

Mr. KENDALL. Dr. Foster told us that he hoped that we might be able to take steps to shorten the time from decision to deployment of the AMSA from something like 8 years to maybe 4 or 6 years. What do you think about that proposal? What can be done about it and what part do you play in that?

General FERGUSON. Well, quite frankly, Mr. Kendall, I think the answer to that question is that we need approval of contract definition and to get on with some hardware. That is the only way you can shorten the IOC date any further, it strikes me.

Mr. KENDALL. So, you do not think we can make any improvement in that area?

General FERGUSON. Well, we have the engine demonstrated. We have the avionics demonstrated and generally selected. We have gone through the aircraft design and the next logical step then is to get two or more contractors to take the results of our previous efforts and put them together into a proposal that then could be translated into hardware.

The next logical step is contract definition.

MIRV AND IMPROVED ACCURACY STILL IN R. & D.

Mr. KENDALL. General, on such matters as MIRV's and improved accuracy, I have been somewhat disturbed by the fact that some of the witnesses have testified about these things as though they are capabilities in being and, of course, they are not, as you brought out. What is the risk in these particular programs and what is your degree of confidence that we can actually achieve the design goal of a CEP of a [deleted], for example?

General FERGUSON. I think we will achieve the CEP all right but as you know, our first flight of the MINUTEMAN III guidance system is not [deleted]. So, you are quite right, we have the design completed and we have done the engineering, but the flight test is [deleted] away and that is the real proof. As you noted on the film clip that I showed you, this is quite a sophisticated arrangement. Yet, we have attacked this kind of a problem before. The TITAN III C that launched the communication satellites had a somewhat similar problem, but not quite so difficult as this one [deleted]. But, I think we understand what it is we are trying to do. I am sure, like every other advanced development, there will be problems, but I am confident we will solve them.

IMPROVED ICBM ACCURACIES

Mr. KENDALL. Some people have suggested it might be difficult, if not impossible, to achieve ICBM accuracies down to [deleted] or less without the use of radio in-flight correction. Is this matter being considered in your shop?

General FERGUSON. Yes, it is, and we have the benefit of the best scientific judgment in this country to help us to determine what course we ought to follow. We are deeply involved in this in our activity out on the west coast.

Mr. KENDALL. Do you have any feeling that it may be necessary to resort to this?

General FERGUSON. I think there are several options open to us [deleted].

Would you like to add to that?

General HOLZAPPLE. Yes. Historically, our ICBM accuracies have been to confirm, or better, our theoretical forecast. The MINUTEMAN II estimated accuracy, based on our best predictions, was about [deleted]. Actually, we are finding that we are getting about [deleted]. This is indicative that the techniques developed are workable. We have confidence now that we can achieve our design objectives. We can also project that a MINUTEMAN III will approach [deleted]. We have some confidence that our actual results will come close.

General FERGUSON. I have a slide that will show you what our experience is so far, if you would like to see it. The figure on the left indicates some of our impact points indicated by the blue triangles. You will note that [deleted] so there are several of them well inside [deleted].

Mr. KENDALL. Does this illustrate the so-called [deleted] problem?

General FERGUSON. [Deleted.]

MIRV

Mr. KENDALL. Is there any possibility that the interaction between the MIRV warhead and the bus when each MIRV leaves it would affect or degrade accuracy of the successive MIRV's?

General FERGUSON. Successive MIRV's—you know, [deleted].

LIMITATIONS OF FB-111 AS STRATEGIC BOMBER

Mr. KENDALL. Going to manned bombers, for a moment, there has been some criticism of the FB-111 as a follow-on bomber on the ground that it is too small a vehicle to carry the necessary penetration aids to survive in sophisticated air defense. Just how severe, in your opinion, is the size and range and weight a handicap to the FB-111 as a strategic bomber?

General FERGUSON. Well, we were quite aware of its limitations in this respect that you are mentioning when the Chief of Staff and the Secretary made the recommendation that we substitute the FB-111 for the earlier B-52's. The airplane is going to be able to cover the targets that we want it to cover quite adequately. It has so many advantages over the earlier B-52's in terms of much smaller radar cross section and much higher speed at lower altitude that they offset any other shortage. In my opinion, it is going to be a useful complement to the later version of the B-52 until we can get an AMSA.

Senator STENNIS. Repeat that, please.

General FERGUSON. It will be a very good substitute for the earlier versions of the B-52's which it is to replace.

Senator STENNIS. Earlier?

General FERGUSON. Yes, sir.

Senator STENNIS. Thank you.

R. & D. EFFORTS ON WEAPONS TO DESTROY HARD TARGETS

Mr. KENDALL. What are we doing, General, in the R. & D. field, with respect to weapons or warheads that are designed to destroy hard targets?

General FERGUSON. The accuracy really is the answer to that question. As you know, we had a Mark 17 in design for a while. That was canceled within the last year because our projections of the effectiveness and the accuracy of the Mark 12, which is to be on the MINUTEMAN III, were so close that we felt that the Mark 17 was an unnecessary undertaking.

We are also looking at a follow-on to the Mark 12 which will be a [deleted]. Hopefully it will have a higher order of accuracy than we have achieved so far.

MISS DISTANCE MORE IMPORTANT WITH SMALLER WARHEADS

Mr. KENDALL. You are going to smaller warheads. Does not the miss distance under such circumstances become more important?

General FERGUSON. Yes; but we are looking for increased accuracy which offsets that factor.

Mr. KENDALL. But the question of accuracy itself takes on added importance with a smaller warhead.

General FERGUSON. Yes.

EFFECTIVENESS OF MIRV AS HARD TARGET KILLER

Mr. KENDALL. For example, what would be the effectiveness of MIRV as a hard target killer if you did not get better than, say, a CEP of [deleted]?

General FERGUSON. I cannot answer your question directly without—

General HOLZAPPLE. [Deleted.] It might be as much as [deleted] less, depending on the target and yield of the vehicle.

Mr. KENDALL. Well, what I have in mind, is that, if we are not able to achieve the [deleted] accuracy with the MIRV warheads, and the even lower accuracies predicted for POSEIDON, whether we are going to be out of the hard target killer business as far as ICBM's are concerned, except for the TITANS, which are scheduled to be phased out?

General FERGUSON. No. The present warheads I showed you on the previous slide show an accuracy of [deleted].

Mr. KENDALL. Do you think that would kill a hard target?

General FERGUSON. It is a good weapon for that purpose.

FACTORS AFFECTING ICBM ACCURACY

Mr. KENDALL. As I understand it, accuracy is primarily affected by four factors—the guidance and control hardware, the gravitational forces, knowledge of location of the target or geodesy aspects, and the problem which arises when the warhead separates from the boosters. Is this generally correct?

General FERGUSON. I would think so; yes.

Mr. KENDALL. Are there any unresolved problems in those areas? What do we know about the problems?

General FERGUSON. We are learning more about all of them each day. In the area of geodesy, our knowledge of the surface of the earth and the distance from point A to B is improving. Our R. & D. flight tests on the Western Test Range are giving us more experience in the separation of the booster from the reentry vehicle. The guidance question is becoming better known to us and we are achieving a higher order of reliability.

LOCATION OF TARGET

Mr. KENDALL. Well, with respect to the location of the target, for example, how can we hope to get [deleted] accuracy when in many cases we do not even know within [deleted] where the target is actually located?

General FERGUSON. That presents a very difficult problem [deleted].

Senator STENNIS. [Deleted.]

General FERGUSON. [Deleted.]

Senator STENNIS. All right.

SILo HARDENING PROGRAM

Mr. KENDALL. Are you involved, General, in any manner, in studying possible counteractions to the possible use by the Soviets of [deleted]?

General FERGUSON. Well, there is a very vigorous program for hardening silos to protect the missiles before launch which I demonstrated on the film [deleted].

Mr. KENDALL. How serious a problem is [deleted] in your judgment?

Senator STENNIS. Explain what [deleted], please.

General FERGUSON. Mr. Chairman, can we go off the record?

Senator STENNIS. Yes; certainly.

(Discussion off the record.)

Senator STENNIS. Back on the record.

We will have questions now by the members. I will be quite brief in mine. Senator, I will call on you next.

Now, for those who were not here, General Ferguson is Commander of the Air Force Systems Command, which is a command set up several years ago. It is highly important. You do not have responsibility, of course, for all the research in the Department of Defense, but you do have it for the Air Force; right?

General FERGUSON. That is right; yes, sir.

MANPOWER AND MONEY PINCH IN R. & D.

Senator STENNIS. Particularly as it relates to weapons.

Now, with respect to money and manpower, have you felt a pinch for either one—manpower or money?

General FERGUSON. I must say I felt the pinch for both; yes, sir.

Senator STENNIS. To what extent? You said you are husbanding what you have as best you can. I am sure you are.

General FERGUSON. We are.

Senator STENNIS. To what extent do you feel a pinch on manpower, say, first? Accomplished manpower.

General FERGUSON. In the last 3 years we have lost several hundred R. & D. officers as part of the program to take rated officers and put them back into flying assignments, and with this I can find no fault. I think it is right. But just the same, it has created a real problem for me in the Systems Command. I have substituted for experienced lieutenant colonels a great number of lieutenants, and I now have 33 percent of the officers in the command who are lieutenants. But, they are very fine lieutenants. They have advanced degrees but they just do not have the experience. So, this is one shortage in terms of exposure to the facts of the real world. Then, in numbers we are short.

Senator STENNIS. It is up to you gentlemen within the services to distribute your manpower. I was thinking in terms of scientists, outside civilians, scientists, et cetera.

General FERGUSON. We have a vigorous program of recruiting young men out of colleges into civil service. We are doing the best we can. We have got a program where every one of my center commanders is charged with going to the nearest universities and establishing liaison with the deans of engineering and inviting them to our places of business to show them what we are doing and see if we can encourage young men to come and join with us. We are having some success, but as of now, in this day and time, the opportunities in industry are also very high. We are trying to get competitive and we are having some luck, but not very good luck.

Senator STENNIS. The engineers and chemists, and all, that are coming out of the colleges, how do you get them?

General FERGUSON. How do we get them?

Senator STENNIS. Yes.

AFSC RECRUITMENT ACTIVITIES

General FERGUSON. Well, as I described to you, to give you an example, my commander at Eglin Air Force Base, in Florida, is charged with going to Tulane, in Mississippi, Alabama, and to the University of Florida, and inviting the deans of engineering with any interested graduate students to Eglin to show them the kind of work we are doing and the opportunities for young men. We do this in 15 places throughout the country and in this fashion we get them interested. This is followed by a recruiting team that goes to see them.

Senator STENNIS. A scientist of eminence, how do you handle that? I mean, men of established—

General FERGUSON. Well—

Senator STENNIS. (continuing). Place in chemistry or physics, et cetera. Engineers?

SCIENTIFIC ADVISORY BOARD

General FERGUSON. The Air Force is very fortunate to have a fine Scientific Advisory Board. Currently, the military director is General Holzapple. This is composed of about 70 of the top scientists and engineers in the country and they work for me in a sense. We have division advisory groups who provide us with scientific and technical advice and their best judgments on the resolution of the difficulties or courses

to follow, and in this way we have the scientific communities tied into our activity.

Senator STENNIS. All right. That gives us an idea. You are authorized to pay them on a per diem basis?

General FERGUSON. Yes; they are on per diem.

Senator STENNIS. That is adequate?

General FERGUSON. Yes, sir. I have never heard a complaint.

Senator STENNIS. It works all right.

General FERGUSON. Yes, sir.

SHORTAGES OF FUNDS

Senator STENNIS. What about shortages of money? Where does that come in? You just be frank. You are not volunteering this. We are asking you for specifics.

General FERGUSON. Well, I presume it was ever thus, Mr. Chairman. In this area there are always things we would like to do that we cannot do for want of money.

Senator STENNIS. Well, do you have in mind a program that you want to carry out and are not permitted to do so for the lack of money?

General FERGUSON. Well, I can say this, that in formulating the 1969 budget, my divisions, which collectively comprise our total effort from research to actual management of the plant, asked for about \$600 million more than we finally got in the program. I think General Holapple, also in earlier testimony, had identified a lot of those items.

Senator STENNIS. Well, all right, we will let you submit a statement on that if you will, because I want to get to these other gentlemen.

(The information furnished follows:)

FISCAL YEAR 1969 LISTINGS, BY BUDGET ACTIVITY—SIGNIFICANT AIR FORCE R.D.T. & E. ITEMS DISAPPROVED OR REDUCED BY THE DOD
[In thousands of dollars]

Activity and program	Air Force request	Approved
Military science (no significant OSD reductions).....	167,703	162,516
Aircraft and related equipment.....	967,868	572,085
F-111 squadrons.....	(134,800)	(117,300)
OSD rationale. Based on a revised Air Force estimate of requirements for the Mark II Avionics package.		
VTOL aircraft (United States/Federal Republic of Germany).....	(73,900)	(2,000)
OSD rationale. Fiscal year 1969 funding is to complete system definition only.		
VTOL engine development.....	(45,000)	(15,000)
OSD rationale. The United States and Federal Republic of Germany have elected not to proceed with prototype acquisition of the US/FRG VTOL aircraft. A reduced funding level is possible since a more relaxed lift engine development may be conducted.		
AMSA.....	(40,000)	(30,000)
OSD rationale. Lack of demonstrated urgency to begin engineering development during the coming year.		
AF reclama. The Air Force recommends that contract definition be accomplished in fiscal year 1969 to preserve a timely option to initiate full-scale development at a later date.		
F-12.....	(169,700)	(0)
OSD rationale. The OTH/AWACS/F-106X provides an appropriate level of air defense for less cost than the OTH/AWACS/F-12 combination. The F-12 program has therefore been terminated.		
AF reclama. The Air Force recommends that in fiscal year 1969 a development program for a limited number [deleted] of F-12's be initiated at an estimated cost of \$60,000,000.		
FX advanced tactical fighter.....	(53,000)	(30,000)
OSD rationale. Questions remaining to be answered on this program dictate that contract definition be planned for fiscal year 1970. Concept formulation work and an experimental program on the associated engine and avionics for this system should continue in fiscal year 1969.		
AF reclama. The Air Force recommends that contract definition be initiated in fiscal year 1969 on the FX aircraft. This would allow an initial operational capability in [deleted]. Total fiscal year 1969 requirement for the FX is revised to \$48,200,000. Since the reclama, the fiscal year 1969 requirement has been revised to \$57,450,000.		

FISCAL YEAR 1968 LISTINGS, BY BUDGET ACTIVITY—SIGNIFICANT AIR FORCE R.D.T. & E. ITEMS
DISAPPROVED OR REDUCED BY THE DOD—Continued

[In thousands of dollars]

Activity and program	Air Force request	Approved
AX aircraft..... OSD rationale. This funding provides for contract definition in fiscal year 1971. This will permit incorporation of information derived from the use of A-7 and OV-10 aircraft. Fiscal year 1969 and fiscal year 1970 funds should provide for the technology to support the aircraft development. AF reclama. The Air Force recommends that contract definition be initiated in fiscal year 1969 at a cost of \$5,000,000. Associated system development efforts will require a total of \$24,500,000 in fiscal year 1969 which will result in initial operational capability in 1971.	(75, 000)	(2, 500)
Missiles and related equipment..... Minuteman squadrons..... OSD rationale. The fiscal year 1969 budget includes all the funds requested for the basic program plus \$16,400,000 of the \$67,900,000 requested by the Air Force for new features which will result in increased capabilities. The new features funding was less than requested because the programs and funds required for most of the new features were not adequately justified. Slip MM III IOC [deleted]. Cancel the MK 17, [deleted]. AF reclama. The OSD rationale on the basic program substantially agrees with the Air Force program change request concerning a [deleted] slip of Minuteman III, cancellation of the Mark 17, and [deleted]. There is some concern on the additional capabilities requested which OSD reduced from \$67,900,000 to \$16,400,000. (The hard [deleted] silo program does include \$6,000,000 that was requested for Minuteman III compatibility that was included as a part of the Minuteman additional capabilities request.) The Air Force plans to rejustify much of the increased capabilities requirement with more specific data.	1, 104, 458 (455, 600)	939, 313 (413, 400)
[Deleted]..... OSD rationale. The initial fiscal year 1969 service request of \$113,000,000 was for [deleted] and related facilities. The Secretary of the Air Force later proposed a Dual Capability Silo program. AF reclama. The Air Force agrees with the initiation of a dual capable silo approach but continued to recommend immediate contract definition [deleted].	(113, 000)	(38, 000)
Western Test Range..... OSD rationale. The program was reduced by \$12,000,000 as a result of the decision to delay the reentry system evaluation radar (RESER) program. Any funds required in fiscal year 1969 for RESER must be obtained from within resources that are made available to the USAF. The funds remaining are considered adequate for the program proposed for fiscal year 1969.	(76, 018)	(63, 534)
Eastern Test Range..... OSD rationale. The \$157,600,000 in fiscal year 1969, when augmented by expected increased reimbursements from NASA as a result of Bureau of the Budget determinations, provides a program funding level approximately \$4,600,000 less than requested by the USAF. This reduction was made in anticipation that the economies achieved in fiscal year 1968 by increased efficiencies in range contractor support and improvements in range operating procedures would be continued and further expanded to provide additional reductions in range operating costs. AF reclama. The Air Force has attempted for some time to obtain a more equitable cost-sharing arrangement between NASA and the Air Force on the ETR. This determination by Bureau of the Budget for increased reimbursements by NASA is a step in this direction.	(179, 497)	(157,591)
Military astronautics and related equipment..... MOL..... OSD rationale. \$600,000,000 is provided in fiscal year 1969 to continue the MOL development program on the new schedule which provides for the first manned launch in [deleted] 1971.	1, 399, 233 (640, 000)	1, 261, 947 (600, 000)
[Deleted]..... OSD rationale. OSD has canceled [deleted] as an operational system. \$10,000,000 of fiscal year 1969 resources have been incorporated in [deleted]. AF reclama. The Air Force sees a critical need for the [deleted] R. & D. efforts as an operational system and is convinced that the program should not be limited to [deleted].	(20, 000)	(1, 000)
Other equipment..... Airborne warning and control system (AWACS)..... OSD rationale. \$75,000,000 is believed adequate to support contract definition.	477, 014 (103, 000)	392, 758 (75, 000)
Programwide management and support..... DATM..... OSD rationale. Fiscal year 1969 is based on the same level of funding that was provided in fiscal year 1968. This element is considered a "level-of-effort" program and will continue to be treated as such in future reviews. AF reclama. The \$120,300 level of funding does not provide adequate funds to support either the approved levels of manpower or the resupply of the depleted inventories of technical supplies and equipment. To live within the approved level of funding would require a reduction of 483 civilian man-years in fiscal year 1969 from this program element. The minimum Air Force requirement is \$126,900,000.	301, 537 (140, 446)	266, 681 (120, 315)
Command management and base operations..... OSD rationale. Fiscal year 1969 is based on the same level of funding as was provided in fiscal year 1968. This element is considered a "level-of-effort" program and will continue to be treated as such in future reviews.	(158, 205)	(143, 988)

Just one more word about research. You are not responsible for this and the Air Force is not. However, I noticed in handling the authorization bill for fiscal year 1969, which includes research and development, that we got off on a few million dollars' worth of small projects. Most of the debate was on the provision for research and development for sociological projects, and so forth, that Defense is carrying on, some in South America, some in Asia. There are all kinds of small items, I think.

My point is, I wish you military men would get that out of the way. It does not belong primarily in the military. It taints your program and you wound up over there reduced in the sum authorized. You may not be familiar with that but—

General HOLZAPPLE. Well, Mr. Chairman—

Senator STENNIS. You had better try to clean that out. Let us not argue it now. We are going to look into it. It was thrown up to the committee and we did not know enough about it. We did not know a great deal about it because we had other things that are so much more important. I mention that to you now because you are interested in the research and development appropriation.

NEED FOR WIND TUNNELS

Now, on page 50 you mentioned wind tunnels. I will be very brief about this. One of the wind tunnels you use is down in Tennessee, I believe.

General FERGUSON. Yes, sir.

Senator STENNIS. What is in the budget this year, if you know, for that wind tunnel?

General FERGUSON. Mr. Chairman, I would have to provide that for the record. We have requested improvements of those tunnels down there.

(The information furnished follows:)

The AFSC recommended program for Arnold Engineering Development Center (AEDC) wind tunnel facilities is as follows:

Name	Fiscal year 1969 OSD		Fiscal year 1970 requested
	Requested	Approved	
Gas dynamic hypersonic wind tunnel (HIRHO, phase I).....	3.95		
Aerodynamic wind tunnel, subsonic (V/STOL).....	11.68		
Aerodynamic wind tunnel, hypersonic (TTT).....	30.96	(1)	
Modification of propulsion engine test cells.....	3.24	4.08	
Total.....	49.83	4.08	
Gas dynamic wind tunnel, hypersonic modification.....			1.33
Gas dynamic wind tunnel, hypersonic (HIRHO I).....			3.95
Aerodynamic wind tunnel, subsonic (V/STOL).....			12.38
Gas dynamic wind tunnel, hypersonic (LORHO I).....			17.43
Total.....			35.09

¹ Deferred to fiscal year 1972 due to lack of approved programs.

In fiscal year, AFSC has approval for \$.92 million in MCP funds to improve the Gas Dynamics Wind Tunnel at AEDC.

Senator STENNIS. All right. Let me tell you this. I handled the bill 2 or 3 years ago in which the Air Force was plumping for, I think,

about \$2½ million for additional runways down there instead of wind tunnels.

General FERGUSON. That is very true.

Senator STENNIS. We disapproved it. Let me finish my point. We disapproved it because we found out it was primarily for the convenience of the Air Force people flying in and out. We did not approve it that year. I have not been on the subcommittee lately, but the point is that they were not asking for the most urgent need. I said then that you need wind tunnels and other items more than you need additional runways. So, you people in research have got to stand your ground stronger within the Air Force and urge your priority needs.

I mention that in passing. At that time I did not think the extra runways were needed except for convenience. Well, I pass this on now.

Senator Thurmond?

LEADTIME ON DEVELOPMENT AND DEPLOYMENT

Senator THURMOND. Thank you, Mr. Chairman.

General Ferguson, I want to commend you for the magnificent job you are doing and the leadership you are providing in this field. In my judgment the very type work you are doing upon that may determine the survival of this Nation if the Soviets maintain their goal of world domination. We have got to stay ahead in research and development and we have got to do it years ahead.

Does it not take from 6 to 10 years from the time something is put on the drawing board until it actually comes off in the form of hardware that can be used?

General FERGUSON. That is a good figure; yes, sir.

MINUTEMAN DEVELOPMENT AND IMPROVEMENTS

Senator THURMOND. [Deleted.]

General FERGUSON. It is a problem that we are attacking as vigorously as we know how. We have an office that we have set up in our MINUTEMAN program office whose sole mission in life is to correlate our developments and our improvements on MINUTEMAN with [deleted].

I cannot answer your question specifically, but I can say that we are very sensitive to it and we are doing all we can to understand it better and make the proper corrections.

FIELD OF SOVIET WARHEADS

Senator THURMOND. The same research and technology developed along that line, of course, would be—the results would be helpful, too, with regard to the effect upon our MINUTEMAN and other missiles in silos if a large bomb should be dropped here. What do you feel is the most powerful bomb the Soviets have, about 60—

General FERGUSON. I think the number I have seen is [deleted] as a possible upper limit on the warhead, [deleted] megatons on the upper limit for the [deleted.] I think they have tested one larger than that.

Senator THURMOND. They tested one about 60 megatons and the intelligence we had indicated that if they could make a 60, they could make a 100-megaton warhead. But you would not be familiar with that.

General FERGUSON. I know no more than just what you have said on that score.

Senator THURMOND. Now, several years ago I know we were very concerned that if they did develop a very powerful warhead like that and they were able to drop one over our missiles in a silo, it would do just what you said, [deleted].

Now, who is doing work along that line chiefly to determine what can be done to protect against that?

General FERGUSON. We are, with the help of the AEC and others. The film that I showed you was designed really to experiment in this area. The large burst that you saw was to simulate the overpressure and the shock wave of a near nuclear burst against a silo. That produced up to a [deleted].

Now, the AEC is doing a lot of work for us in conjunction with tests other than those that I showed you on the film. [Deleted.]

LIMITATIONS ON TESTING OF WEAPONS

Senator THURMOND. Of course, since the nuclear test ban treaty, we have been handicapped because the only way you can really test a weapon is in the environment in which it operates.

General FERGUSON. That is right.

Senator THURMOND. And, we have to test now underground, which is unsatisfactory, but we do the best we can.

General FERGUSON. That is right, and we have done fairly well.

OVER-THE-HORIZON RADAR

Senator THURMOND. Now, we have heard a lot about the over-the-horizon radar but so far I have not been impressed by the numbers of these installations that are now operational or are scheduled for future installations. Can you bring us up to date on that?

General FERGUSON. The sites that we have installed provide us with what appears to be [deleted]. Maybe General Holzapple—

General HOLZAPPLE. I might add a footnote to that. There are two basic kinds of over-the-horizon radar, and the one General Ferguson has just been describing is called the forward scatter [deleted]. We can actually detect when a missile goes through the ionosphere. The correlated data provides early warning on the fact that a missile has been launched through the ionosphere.

Now, another type of over-the-horizon radar is part of our proposed air defense for the continental United States. It uses the same technique of bouncing radar waves off of the ionosphere and the ground, but it is back scatter. It actually receives a radar return from an object flying through the air. The object—an aircraft, or possible a submarine-launched ballistic missile reflects energy back to the receiver at the transmitter site. You can actually see out over the horizon and see an aircraft flying along in the air. Both are over-the-horizon radars with the forwardscatter DTH described by General Ferguson being

used for ICBM warning. The back scatter OTH radar is going to be one part of our three-part system for air defense. It combines the AWACS with modernized interceptors and this continental U.S. over-the-horizon radar system of the back scatter type. This is scheduled to constitute our complete air defense system.

Senator THURMOND. Are you continuing to work on this problem—

General HOLZAPPLE. Yes, sir.

Senator THURMOND (continuing). To improve the effectiveness and have we made progress in the last 5 years?

General HOLZAPPLE. Yes, indeed; we have. [Deleted.]

SOVIET BUDGET FOR STRATEGIC WEAPONS AND SPACE

Senator THURMOND. Thank you. I am trying to get estimates of the Soviet budget that is allocated to strategic weapons and find that most answers are rather vague. The Library of Congress experts, for example, report that the Soviet budget is so well camouflaged that they cannot give me anything better than an educated guess.

I am just wondering if you would give us the data that you use in determining the comparison between the Soviet and U.S. strategic weapon and space expenditures. If you do not have that, you might—

General FERGUSON. I have got some numbers right in front of me, Senator Thurmond; 1967—excuse me. May I ask you to repeat the question again? I have a number of figures here that I could quote. Was it the investment in strategic—

Senator THURMOND. About the estimates of the Soviet budgets allocated to strategic weapons.

General FERGUSON. Strategic weapons. Yes, sir. In 1967 strategic offensive forces in the U.S.S.R., they spent [deleted] as against \$41½ billion for the United States strategic offensive forces.

Senator THURMOND. In other words, they were spending more than we were.

General FERGUSON. In that 1 year, 1967. I am quoting now from the [deleted] report dated [deleted] and the title is [deleted]. This is a pretty good break out of Soviet defense expenditures.

Senator THURMOND. There were efforts a few days ago to cut the research and development on the floor and there was a fight to keep it from being cut. Nothing, I think, is more important than this research and development, and any information that you gentlemen can get us before a bill comes up here along the lines of research and development, you had better do it because we need it to fortify our position.

General FERGUSON. Well, I have given you this reference, Senator, and it gives the numbers that I think you are looking for and these are numbers that are put together by a special group [deleted] last fall to take a look at the Soviet budget and compare it with ours.

Senator THURMOND. There might be some material we cannot use on the floor of the Senate because of its sensitive nature but if you get us all that we can use, get it to the members of the committee, it will be very helpful to you for us to have that to try to help retain the

appropriation that you ought to have and need for us to keep ahead of the Soviets.

General FERGUSON. I will see that Mr. Kendall gets a copy of that report.

(The information furnished is classified.)

Senator MILLER. Were those figures you gave for 1967 R. & D. figures only or total figures including production?

General FERGUSON. I think it includes some production. It is pretty hard, as you know, to get any break out of the Soviet budget completely, but this is the best effort I have seen to try to compare apples with apples. Converting to rubles and converting to a different way of doing business is pretty difficult, but I think this is quite a fair and objective attempt to take a look at what they are spending and what their trends are, military and space.

SOVIET R. & D. EXPENDITURES

Senator MILLER. [deleted] did not break anything down by R. & D.; did they?

General FERGUSON. Yes, they have a chart in here on R. & D.

Senator MILLER. Tell us whether that—

General FERGUSON. They have a chart that—graphs from 1950 to 1967, the R. & D. expenditures, the general purpose expenditures, and the strategic expenditures in chart form. I will see that the counsel of the committee gets a copy of that report, if you like, Mr. Chairman.

Mr. KENDALL. Is that the [deleted] report?

Senator STENNIS. All right. We are back to you.

General FERGUSON. Yes; dated [deleted].

FB-111 TERRAIN-FOLLOWING RADAR

Senator THURMOND. General Ferguson, you mentioned that one of the advantages of the FB-111 was its terrain-following radar. Is that not the cause or was it the cause of the loss of several F-111A's in Vietnam and what difficulties have you had with the system?

General FERGUSON. I cannot answer the first part of your question, but we have a top-level team over there now investigating the accident, Senator Thurmond. We have had little or no trouble, and I can speak from personal experience, on that particular part of the airplane. It worked perfectly the time I flew it under the most difficult conditions on the west coast, down to the bottoms of valleys, over mountains and back again.

There was one instance that was reported to me by the program office in which there was an electronic failure of this device. It was, I think, an error in wiring which was identified and corrected and that is the only case that I know of in which there has been any difficulty with the terrain-following radar.

Senator THURMOND. I have about three more questions, but my time is up.

Senator STENNIS. We will get back to you.

Senator Miller?

"GREAT DIFFICULTIES" IN SHORTENING AMSA PRODUCTION SCHEDULE

Senator MILLER. Thank you, Mr. Chairman.

General, I want to be associated with the complimentary remarks of my colleague, Senator Thurmond, on the job you and your people are doing in Systems Command. Getting back to the AMSA, you stated that contract definition is the next logical step. I get the impression that that is recognized but we have been told that there may be some way of shortening the production time so that if contract definition is postponed for a year, that by shortening the production scheduling and working out some kind of an accelerated production program, we still might be able to save that year in the production cycle. Is that feasible, in your judgment?

General FERGUSON. Well, it may be feasible but I can see great difficulties with that kind of an approach. It would call for an awful lot of overtime. It seems to me that on an airplane like this and on all modern airplanes, sophisticated as they are, we ought to take our time and go through it thoroughly in the early stages to know as best we can precisely what the technical complexities and difficulties and challenges are. I am inclined toward what has been called the prototype approach in the past.

Now, that means different things to different people, but it means going as far as you can toward seeing the hardware or at least the major components, the engine running and avionics running in a test-bed, and mockups, and, hopefully, going ahead and building two or three of the airplanes to be sure we know what it is, what it can do, and what it will cost.

This is where I think the real emphasis is needed. This is where we have always run into our difficulties before, the early phases of development.

NEXT STEP ON AMSA IS CONTRACT DEFINITION

Senator MILLER. Do you think our production scheduling is trimmed down about as well as it can be, taking into account a prudent use of prototypes and evaluation of the production model before we go into production, General Holzapple?

General HOLZAPPLE. Yes, I do; and I personally think that what General Ferguson has just said really implies that the first part of the next step is contract definition. You cannot build a prototype, you cannot mock up the avionics unless you know precisely what is involved and have the system actually integrated; that is, the avionics with the airframe and with the engines. It is getting down to the business of determining very precisely what the system will be. We call that contract definition.

Now, if you want to shorten the leadtime and call it some other name, all right, but it really is the same thing and it takes money and authority to go ahead.

Senator MILLER. I have the uneasy feeling that without testimony from somebody like you and without particular knowledge about this

subject, that some kind of euphoria could be spread by the thought that by postponing contract definition for another year, we did not have to worry too much about it because they were going to make a study to try to cut down the production time for the models which would save the year, so that we are really not going to lose that year after all, and I take it you do not agree with that.

General HOLZAPPLE. I do not.

PENETRATION CAPABILITIES OF FB-111

Senator MILLER. Thank you.

Now, General Ferguson, on page 21 of your statement, you say the penetration effectiveness of the FB-111 will be enhanced by its higher speed. Higher speed than what?

General FERGUSON. Than the airplane it is replacing, B-52 C's through F's.

Senator MILLER. What about the B-58?

General FERGUSON. Without looking at any notes, I cannot tell you how they compare exactly except they are certainly comparable.

Senator MILLER. I have some figures here—I do not know whether they would agree with yours or not—showing the B-58 going [deleted] miles at mach [deleted] and the FB-111 going only [deleted] miles at mach [deleted] plus an additional [deleted] miles for both at mach [deleted].

If these figures are proper, it would seem that the FB-111 would not enhance the situation vis-a-vis the B-58.

General FERGUSON. Well, I think you have to couple that with the penetration aids and the weapons that both carry.

Senator MILLER. The terrain-following features.

General FERGUSON. The terrain-following features and also the radar cross section which gets more and more important because as the defenses go up, the radars grow in capabilities and in numbers and you are detected more readily by the larger reflection which you project with the B-58 than you would in the FB-111.

Senator MILLER. So that what you were really referring to there was a combination of these items of higher speed, lower radar cross section, terrain-following features and you did not mean to imply by that that this would necessarily be a higher speed than the B-58?

General FERGUSON. That is right. It is really a function of the targets we are going after, too. There may be certain targets where you can afford the additional fuel required to go faster for a shorter distance.

ADDITIONAL FUNDS NEEDED BY AFSC

Senator MILLER. This \$600 million of additional money requested by your division—did that cover acquisition or development of facilities which you have laid great emphasis on?

General FERGUSON. I find on later review of the total requests of my commanders that they asked for considerably more than we could expect to get approved. Consequently, my staff and commanders examined these very carefully and reduced them. This resulted in AFSC having unsatisfied requirements to the extent of \$200 million, which

cut across the spectrum of R.D.T. & E. and impinged only slightly on facilities improvements.

Senator MILLER. I was wondering if that amount, then, that you agreed to—of \$200 million—gave emphasis to facilities or—

General FERGUSON. As you are probably aware, major facilities acquisition and major improvements must come through the military construction program (MCP). We are trying to be realistic. We recognize we cannot get all the things we have not done in the last 5 years in 1 year. We went ahead with what we thought was a well considered program and recognized that the things we asked for added up to a number that was higher than might be salable for the year.

Senator MILLER. Could you furnish, for the record, what portion of that represented a facilities development program?

General FERGUSON. Yes, sir.

Senator MILLER. Not just in 1 year but with a view to a follow-on.

General FERGUSON. Yes, sir. I can give you that.

(The information furnished follows:)

The \$200 million, if approved, would have covered additional RDT&E projects and supporting facilities operations, but not facilities acquisition. Our new facilities are acquired under the Military Construction Program (MCP). The technical facilities program approved for the Air Force MCP budget, for FY 1969, was approximately \$90 million; and of this amount, approximately \$13 million was approved for inclusion in the President's budget. Headquarters AFSC proposed a technical facilities program for FY 1970 amounting to approximately \$120 million.

As pointed out, advanced RDT&E facilities are highly complex, sophisticated and exceptionally costly items which should be considered as national resources serving several agencies of the government. We are, therefore, taking steps to develop the overall concept as to the type of facilities which will be required in the future and a plan for their acquisition. We expect to use approximately \$1 million of the FY 1969 RDT&E program and perhaps \$2.4 million of the FY 1970 RDT&E program to conduct the studies which will develop the concepts and plans for a long-range facilities program.

Senator MILLER. Thank you.

AVAILABILITY OF SERVICES OF SCIENTISTS

Now, getting into Senator Stennis' question about your adequacy of scientists, do you have—does the Systems Command have access to contract services of scientists through corporations?

General FERGUSON. Oh, yes. We have several like that. Adjacent to our Electronics Systems Division we have the Mitre Corp., which you might be familiar with. They provide an irreplaceable source of scientific advice and the principal systems engineering and technical direction in our very complicated command and control communications system. Then, we have, out on the west coast, the Aerospace Corp., that is adjacent to the space and missiles system organization. It has done much of the work on our space systems and space guidance and a lot of work on ballistics missiles as well.

Senator MILLER. So that if you are not able to obtain in-house capability through the recruitment program that you mentioned, you still have the access to good scientific knowledge through these corporate—

General FERGUSON. Oh, yes; we would be lost without them.

Senator MILLER. Well, is it working out satisfactorily?

General FERGUSON. Very well. Nevertheless, I have in work right now a thorough review of the not-for-profit, so to speak, Federal science research centers, just to be sure that we are on solid ground in terms of the work they are doing and their size and their configuration.

Senator MILLER. Thank you.

Now, are those contracts with Systems Command or with Air Force as such?

General FERGUSON. No. They are part of our budget.

Senator MILLER. All right. This recent—did you have a comment?

General HOLZAPPLE. No, other than to add we do have the benefit of the services of our Scientific Advisory Board, which consists of 70 very, very able people who contribute quite a lot.

RECENT UNDERGROUND NUCLEAR TEST

Senator MILLER. One last question. This recent, apparently large, underground nuclear test which occurred, I think, last week, and if you want to go off the record on this it is all right, too—what was the Air Force interest in that?

General FERGUSON. May I ask my nuclear expert, Colonel Dunn, if he knows anything about it? I am afraid I do not know much more about it than what I read in the papers.

Colonel DUNN. I believe that was [deleted] as I understand it, but perhaps we should provide you with a comment on that.

Senator MILLER. If you would care to—if you would provide for the record what Air Force interest there was in that test. I would like to get it.

General FERGUSON. We have some interest in almost all of them, but in this particular one I am not prepared to say, but we will get the information and provide it for the record.

(The information furnished is classified.)

Senator MILLER. All right. No further questions.

Senator STENNIS. Thank you, Senator.

Senator CURTIS, we are glad to have you here. Do you have some questions?

PROBLEMS IN RECRUITING AT COLLEGES

Senator CURTIS. Thank you.

In reference to recruiting young men on college and university campuses, are you barred from any campuses?

General FERGUSON. We had a few difficulties recently, but I cannot be specific. I was speaking about recruiting civilians and the recruiting was being done by civilians, so the question of the uniform on the campus did not arise.

Senator CURTIS. That could be supplied for the record.

General FERGUSON. Yes, sir.

Senator CURTIS. But, I would like to have it.

General FERGUSON. All right.

(The information furnished follows:)

Statistics regarding Air Force Systems Command's College Recruiting Program to date indicate that the Command has made 300 visits to 200 colleges and universities. During these visits more than 2,000 students were interviewed for

employment opportunities as scientific, engineering and administrative trainees. Only 2 unpleasant incidents occurred with our recruiters as follows:

(a) At Temple Buell College in Denver, Colorado, our recruiter was subjected to a student boycott because of their objections to our Vietnam policies. Consequently, no students came in for interviews.

(b) At San Jose College in San Jose, California, our recruiter witnessed student demonstrations directed against the recruiter of the Dow Chemical Co. However, our recruiter was still able to interview several students.

Normally we advertised interviews in advance, but, in most cases our interviewers were civilians in civilian clothes.

GROWTH OF FB-111 ENGINE

Senator CURTIS. It is a little bit out of your department, but you can supply it.

Is the Air Force starting R. & D. for a new engine for the FB-111?

General FERGUSON. No; not as such, but we are looking at growth versions of the present family of engines that might apply to the FB-111.

Senator CURTIS. Would that be a new engine?

General FERGUSON. No; the engine business is one in which you design one basic engine and then over the years you find by relatively minor improvements and modifications it meets different requirements and we just use it in different airplanes or different models of the same airplane. The different dash numbers represent modifications of the present engine.

Senator CURTIS. Supply for the record the cost of that R. & D. and also the procurement as it relates to the FB-111.

General FERGUSON. All right, sir.

(The information furnished is classified.)

DECREASE IN PENETRATION RANGE OF FB-111

Senator CURTIS. General Holzapple, how much has the penetration range of the FB-111 been decreased since it was ordered in 1965?

General HOLZAPPLE. The penetration range? I would like to supply that for the record, and also I might add that this varies greatly under the conditions under which you are penetrating, so there may be several answers to that question. It could be a complex one. Let me supply that for the record.

(The information furnished follows:)

The following tabular estimates of the current penetration range of the FB-111 versus the original estimate are as follows:

1965	1968
[Deleted]	[Deleted]

While the penetration range, which is that part of the mission that is flown at low altitude while ingressing to and egressing from the target, has decreased from [deleted], the total mileage of the mission has decreased by about [deleted] when using the same penetration speeds as proposed in 1965. If the lower penetration speed of [deleted] is used, the total mileage of the mission can be increased from [deleted].

Senator CURTIS. Does the FB-111 have enough range and payload to be effective as a strategic bomber, in your opinion?

General HOLZAPPLE. Yes; it does.

COMPARISON OF FB-111 WITH AMSA

Senator CURTIS. Would you compare the FB-111 with the AMSA in terms of range, penetration, speed, weapons payload, ECM, payload of penetration aids, and so forth?

General HOLZAPPLE. Yes, sir; let me go down a side-by-side comparison.

Senator STENNIS. Do we not have that in the record?

Senator CURTIS. If it is—

General HOLZAPPLE. I believe you do, but if not, we will certainly supply it.

Senator CURTIS. All right. Let him submit it, then.

(The information furnished is classified.)

Senator STENNIS. Dr. Brown is going to supply that, Senator.

General HOLZAPPLE. I have a side-by-side comparison of every parameter.

FB-111 VERSUS AMSA COSTS

Senator CURTIS. Is it in the record, the relative costs between the two, FB-111 and AMSA?

General HOLZAPPLE. That, I do not know. But, we will certainly supply the best estimates, the present estimates of what the AMSA would cost and what the FB-111 appears to be at this point in time.

(The information furnished follows:)

The 10 year systems costs associated with a force of 210 U.E. FB-111 versus 210 U.E. AMSA are as follows: (10 years systems costs include RDT&E, flyaway, support and operating costs—excludes SRAM and KC-135 Costs.)

[Deleted.]

This of course portrays a pure "force level" comparison. Since the realistic payload capacity of the FB-111 is [deleted] weapons and AMSA is [deleted] weapons, a more meaningful comparison may be portrayed by the number of weapon spaces provided on alert aircraft for equal cost forces. An AMSA force for the same costs as the FB-111 program would provide [deleted] percent more weapon spaces on alert.

COMPARISON OF FB-111 WITH B-52 AND B-58

Senator CURTIS. I think we have already had in the record the penetration range comparing the FB-111 with the B-58 and B-52 C's through F's. I realize there are speed elements and other things in there but my question is, What weapons payload would these planes typically carry, the FB-111, B-58, and B-52 C through F?

General HOLZAPPLE. All right. For the B-52 C through H, the conventional payload in pounds is 54,000. The conventional payload for the FB-111 is [deleted] and for the AMSA, it is [deleted].

Senator CURTIS. What is it for the B-58?

General HOLZAPPLE. It carries a special weapons pod and the payload is not on this particular chart.

General FERGUSON. I think it is [deleted] pounds for nuclear weapons.

General HOLZAPPLE. I will have to supply that for the record.

(The information furnished is classified.)

Senator CURTIS. Thank you.

Senator STENNIS. Thank you.
That brings us back to you, Senator Thurmond.

POSSIBLE MIX OF F-106X AND F-12

Senator THURMOND. Thank you.

General, with regard to the F-106X, you are aware that the Senate Armed Services Committee deleted the funds for that project from the fiscal year 1969 appropriation request. I indicated in my remarks on the Senate floor that the Air Force should present to the committee in more detail the options that are under consideration. It is quite possible that a mix of the F-106X and F-12's might receive better reception. Does the Air Force plan to give us that information?

General FERGUSON. I understood from reading Secretary Brown's testimony, that he did cover that subject yesterday, Senator Thurmond, but if he did not—I am sure that was the essence of our discussion on Saturday.

Mr. KENDALL. Dr. Brown covered it in his statement.

Senator THURMOND. Pardon me. I was in another committee and it is possible he covered it when I was out.

Senator STENNIS. It is fully covered.

Senator THURMOND. No use to go into it.

General HOLZAPFLE. I think the Secretary is making a briefing available which goes into that whole area.

SOVIET R. & D. ACCOMPLISHMENTS

Senator THURMOND. All right. One of the most disturbing intelligence reports that I have seen concerns the Soviet accomplishments in the field of research and development. You have cited development in wind tunnels, test facilities, and other equivalent installations related to space and missile research. Other reports show great development in oceanographic and submarine research and I might say we have just been amazed at the tremendous speed with which they are developing some of these programs. And despite our intelligence collection efforts I have an uneasy feeling that some day the Soviets will develop some significant military capability that will come as a complete surprise.

Would you care to comment on this possibility?

General FERGUSON. Well, this is of continuing concern to anybody in the business that we are in [deleted]. I think we are very sensitive to the problem and we are doing all in our power to be sure that we are not surprised.

Now, coupled with that, of course, must be a vigorous research and development program on our side. Examining all possibilities in a healthy fashion will perhaps thwart any surprises that would give them any great military advantage.

Senator THURMOND. Mr. Chairman, thank you. I have another committee if you will excuse me. Military construction is going on.

Senator STENNIS. I know. Thank you for coming in. We appreciate your attention here.

All right, Mr. Kendall. If it is agreeable to the subcommittee, we will meet at least until 12:30.

RESULTS OF DELAY IN APPROVING AMSA

Mr. KENDALL. To go back to AMSA for a moment, if we had gone to a contract definition on AMSA 2 or 3 years ago, do you think the end product would have been different substantially from the one proposed today? In other words, did we gain anything by delaying the couple of years that we have after the Air Force recommended contract definition?

General FERGUSON. I cannot identify any major breakthroughs that would have made an AMSA started in 1966 greatly inferior to an AMSA started today. There has been a general progression in our understanding and our development of engines and the avionics and structures, yes, but nothing spectacular. So, I think the answer to your question is, the airplane would have been a good one had we started in 1966.

Certainly, like every airplane there are refinements as we go along.

NO R. & D. PROJECTS BEING DELAYED BY FAILURE TO RELEASE FUNDS

Mr. KENDALL. Going back to the subject of money, are any of your significant R. & D. projects being delayed because of the failure to release funds to you that the Congress has provided?

General FERGUSON. I would like to go over the current status of the programs to identify the ones that are currently being delayed, Mr. Kendall, if I could supply that for the record.

(The information furnished follows:)

There are no R&D projects currently being delayed because of failure to have funds released that Congress has approved.

Mr. KENDALL. That will be fine, sir.

SUPERHARD WARHEAD DEVELOPMENT

What are we doing, General, in the field of developing a superhard warhead, if anything?

General FERGUSON. Outside of the work that we are doing on the Mark 12 and [deleted] and with refinements on the present—would you mind if I asked Colonel Dunn, who is an expert in this field to assist me in answering this question?

Colonel DUNN. [Deleted.]

Mr. KENDALL. Let me ask you, in view of its small size and its weight limitations, could you make a MIRV warhead superhard and still leave it with any meaningful payload?

Colonel DUNN. [Deleted.]

Mr. KENDALL. [Deleted.]

Colonel DUNN. That is right, sir.

Mr. KENDALL. [Deleted.]

Colonel DUNN. Yes, sir. [Deleted.]

MIRV PROBLEMS

Mr. KENDALL. Does the smallness and light weight of a warhead such as MIRV present any more difficult problem; General, with respect to very small CEP's? In other words, do you have any type of

problem with a small vehicle that you would not have with a larger one?

General FERGUSON. We have had some minor difficulties [deleted] but generally speaking, I think the answer to your question is "No, there should not be any more difficulty."

Mr. KENDALL. Because of the short flight time of its missiles, as I understand it, sea-launched ballistics systems probably constitute one of the greatest threats to our bomber fleet. Would this be accurate, in your judgment?

General FERGUSON. I understand General Nazzaro feels that way; yes.

MODIFIED SAGE WARNING SYSTEM

Mr. KENDALL. How reliable is the modified SAGE warning system that you discussed and what capabilities does it have?

General FERGUSON. Well, it is to be able to see out [deleted]. That does not go operational until [deleted], Mr. Kendall. And, I am sure there will be tests then to determine precisely its accuracy of response to that mission.

General HOLZAPPLE. [Deleted.]

Mr. KENDALL. It was supposed to go into operation in [deleted]; is that right?

General HOLZAPPLE. Yes, sir; the interim or first capability is scheduled then. [Deleted.]

Mr. KENDALL. [Deleted.]

General HOLZAPPLE. [Deleted.]

Mr. KENDALL. [Deleted.] I understand there is some deficiency which may be time-urgent.

General HOLZAPPLE. I will have to check on that. [Deleted.]

Mr. KENDALL. One thing I do not quite understand [deleted].

General HOLZAPPLE. [Deleted.] You see, we will have two over-the-horizon radar systems as I described a little bit ago. One is the forward scatter [deleted].

[Deleted.]

Now, the over-the-horizon radar we will use in the Continental Air Defense will be primarily against aircraft, but it may give some additional information on sub-launched ballistic missiles.

Mr. KENDALL. [Deleted.]

General HOLZAPPLE. [Deleted.]

PHASING OUT OF SYSTEMS IN THE FUTURE

Mr. KENDALL. Can any existing system be phased out [deleted]?

General HOLZAPPLE. There is very serious inquiry now into whether or not these systems, when actually employed and fully operational, and when they demonstrated that they are effective and reliable, could perhaps make some elements of the BMEWS redundant.

Mr. KENDALL. Would over-the-horizon replace the DEW line, for example?

General HOLZAPPLE. It possibly could eliminate the requirements for the DEW line, but here again, it would be largely the combination of backscatter OTH radar and the AWACS capability that we would have.

U.S. SCIENTIFIC AND TECHNOLOGICAL SUPERIORITY

Mr. KENDALL. General Ferguson, as you pointed out, during the past several years we have seen a massive buildup of the Soviet ICBM capability and instead of our responding to this buildup by hardware of our own; that is, by deploying more missiles or more bombers, we plan to depend primarily on qualitative improvements such as improvements in reliability, accuracy, multiple warheads, et cetera. I am sure you know better than any of us that this reliance on qualitative rather than quantitative response to this threat places an enormous burden on people like you and others in the R. & D. field and the scientific community. Do you believe that our scientists and our technology are sufficiently far ahead of the Soviets to make this policy feasible and one which is without some real risk? Do you believe that we can continue to dominate them on a qualitative rather than a quantitative basis in the strategic area?

General FERGUSON. Well, I think your question must be answered in two parts. First of all, consider whether or not scientifically we are superior to the Soviets, and that is very difficult to determine. They have had a very small corps of extremely fine scientists for many years and as I indicated earlier, they are on their way to educating a great number of their young people in science and technology. So, the first part of the question is just taking a look at the numbers we have right now. I think, as a general statement, I would say that scientifically we are superior today. Yet, I must say that they are showing every indication of exploring extremely sophisticated technology and applying it, like, for example, the landing of a space vehicle on Venus. [Deleted.] I think we are going to have to move a little faster than we have if we are going to stay ahead of them.

DIFFICULTIES IN DECISIONMAKING PROCESS

Mr. KENDALL. Well, I am somewhat concerned not only about the question of whether we will have adequate warning but about the decisionmaking process that sometimes seems interminable in the Pentagon, as you know. Do you have any idea what the decision process would be which would determine when we should take a weapon off the shelf and weaponize it?

General FERGUSON. I have a little difficulty trying to develop an answer to that, Mr. Kendall. You keep referring to technology off the shelf but that shelf is getting a little bare in spots and we are trying to encourage more development. Whether we put it on the shelf or into the airframe or the missile is another question. I think we have identified the AMSA, for example, as a system that has componentry developed that should go ahead into hardware, certainly into the next step which is contract definition. It is my opinion that we ought to get ahead with contract definition on the new large missile. You know, we have approval to go ahead with R. & D. on the hard silo that would be a part of that plan for improving our ballistic missile force.

Mr. KENDALL. You have approval only through the R. & D. phase on the hard silo?

General FERGUSON. That is right, just a relatively few million dollars, but it is a move in the right direction.

Mr. KENDALL. Well, that is what I meant by putting these things on the shelf; that you go through the R. & D. phase and then you get to a point where you have the technology in hand, theoretically, at least, and you stop.

General FERGUSON. Well, we are hoping not to stop in the case of these two.

Mr. KENDALL. I am not arguing that, but, the national policy and the decision has been, so far, that you do stop.

General FERGUSON. Yes.

Mr. KENDALL. I want to know what the decision process is to get started again and whether it will be sufficiently responsive to counter the threat as it develops. That is my real question. It is theoretical, I am sure.

General FERGUSON. I agree with the condition that you have described but I am sorry that I cannot answer your question as to how you resolve it.

Senator STENNIS. How would you proceed if you had a matter that you thought ought to be moved out? If it was stagnant, what would you do?

General FERGUSON. Senator, we have done everything that I know how to do to strengthen our advocacy by taking a calm and collected look at what job is to be done, what the opposition is, to study all the alternatives to solving the problem, and in making the case for a solution as we have in AMSA and as we have in the [deleted]. The decision then is left to people higher up in the decisionmaking process.

Senator STENNIS. Are you permitted ample opportunity to do so?

General FERGUSON. Yes; we have always been given an opportunity.

Senator STENNIS. Repeatedly, when you felt an urge to go back and ask that it be reconsidered?

General FERGUSON. Yes, sir.

Senator STENNIS. All right.

BASIS OF DECISION ON SIZE OF PROPOSED NEW ICBM

Mr. KENDALL. What controlled the decision to design the [deleted] with a [deleted] pound payload; why not [deleted], for example?

General FERGUSON. Taking a look at the range that the warhead had to fly, and the size of a booster to project it to that range, and the state of technology which would permit us to put into that payload a combination of warheads and chaff and decoys, it seemed to be the choice of the various options. It optimized a reasonably survivable booster with a reasonable size throw-weight that gives options that appeared at the time we made that decision to give the flexibility that is needed, and I still think it is right.

Now, this may sound like evading the question, but I do not think you can pin down any more specifically why it is [deleted].

General HOLZAPPEL. There are many considerations, partly it was the technology program on solid boosters. We ran a technology program in the last few years on 156-inch and another on 260-inch large solids and this proved or developed the capability to have boosters of that size. We had high confidence that we could build a missile up to about this size. And then again, you get into practical considera-

tions of the silos and all of the things that have to work together. There is also the question of how many targets can be struck with a single missile regardless of payload.

The fact that we had the technology pretty well in hand on the size of the booster, on projections as to what were efficient combinations of weight and warhead with the penetration aids that we will likely need at that time, it seemed by weighing all of these, and trading back and forth, this was a logical step to the next generation. Some day, with additional technical programs and new knowledge, it may be possible that different sizes or better combinations might be made. But at this time the [deleted] was sized because of the reasons I just mentioned.

Senator STENNIS. Gentlemen, time is about to run out on us. If you could make the questions and answers briefer we might finish before lunch.

Mr. KENDALL. That was my last question, Mr. Chairman.

FUNDS FOR WIND TUNNELS

Senator STENNIS. All right. Getting back to the wind tunnel matter, it seems to me that is a mighty serious question that you raised, General. I wish you would supply for the record the amount that is in the budget this year and what amount was rejected. There might be some chance to do something about it.

General FERGUSON. All right, sir.

Senator STENNIS. I mean, this year.

(The information furnished appears previously.)

POSSIBILITY OF PHASING OUT DEW LINE, ETC.

Senator STENNIS. Now, Mr. Kendall asked you gentlemen about the DEW line. I went through all that when the DEW line and the other installations were put in. Now you are asking for additional warning systems, and I am sure you need them, to a great degree. If these are installed, what will be taken out of your present setup, the DEW line or BMEWS, for instance? What, if anything, is going to be phased out?

General HOLZAPPLE. A large part of the DEW line will be taken out. At some time downstream elements of SAGE and BUIC will be taken out, and a large part of the present interceptor force. And the projections are that the cost of operating our current air defense systems, over the next 10 years, would be about the same as the cost of implementing the proposed air defense system that we have asked for. In a somewhat similar fashion, the [deleted] systems could possibly replace elements of BMEWS.

Senator STENNIS. Well, that is a good point. That is what I was trying to get. Would you be more specific on that in a prepared statement and furnish it for the record? I am asking that you do that.

General FERGUSON. Yes, sir.

Senator STENNIS. Give a timetable as nearly as you can. I know you cannot be accurate about the phasing out of these items like BMEWS, the interceptors, the others, but make an estimate on it and mark it an estimate.

General FERGUSON. Yes; this has all been worked out.

(The information furnished follows:)

The present air defense system was designed in the early 1950s to counter a high altitude, subsonic or slightly supersonic Soviet threat. It consists of long range radars for detection and control, fighter interceptors for area defense, and surface-to-air (SAM) missiles for terminal defense. The system was quite effective against the threat for which it was designed; although it was never expected to be 100% effective.

Exercises using SAC bombers as "fakers" proved the effectiveness of the system against a high altitude attack. These same exercises indicated the requirement to change bomber tactics from high altitude to low altitude in order to increase survivability and penetrability, [deleted]. As the bomber force penetration altitude decreased, the effectiveness of the air defense system was degraded accordingly.

Certain measures, such as the addition of Gap Filler radars, improved the situation, but when the bomber altitude was reduced [deleted] the air defense system became virtually ineffective. This is because the radars, regardless of whether they are used to detect and track or used to guide air-to-air or surface-to-air missiles, are limited to line-of-sight and cannot distinguish targets in the ground clutter. It was not until recently that radar technology advanced to the point that it was possible to provide the capability to see targets masked against the ground clutter.

Analyses conducted to determine the effectiveness of our existing air defenses indicate that in some scenarios as many as [deleted] Soviet heavy bombers would be able to reach successfully their weapon-release point. However, the Soviet bombers in these analyses were accorded the known capability of carrying air-to-surface missiles with a [deleted] range. This naturally results in an increase in the number of bombers which could successfully deliver their ordnance. However, by carrying air-to-surface missiles, the Soviet bomber force's weapon-carrying capacity would be reduced by about [deleted] and delivery accuracy reduced.

The improvements being recommended would increase the effectiveness of the air defense system against the low altitude threat. The following specific improvements are expected. The Over-the-Horizon (OTH) radar will provide detection out to [deleted]. The AWACS will provide a look-down radar capability for initial control of fighters against low or altitude targets. The modernized fire control system for the fighter interceptors will provide a look-down, shoot-down capability and permit them to engage targets regardless of altitude. The Army's SAM-D will improve the low altitude capability of the terminal defenses. These improvements are necessary to counter the existing Soviet threat and prevent them from having a "free-ride" against our military forces or population centers.

A detailed Modernized Air Defense Posture statement including associated costs, has been provided as part of Secretary Brown's and General McConnell's testimony of 30 April 1968. Specifically, inserts for the record to pages 617-618 and 620.

With regard to the missile warning and surveillance systems, the Air Force has continually assessed the effectiveness of these systems. This has resulted in selective improvement of their performance or their replacement. On instruction from the DoD, the Air Force will report in September 1968 on optional mixes of surveillance systems, current and planned. This report will contain various ratings of cost effectiveness. Contingent on the conclusions of this report, it is possible that some existing Air Force surveillance elements could begin phaseout between [deleted].

Senator STENNIS. And put figures on it. That has not been really brought out at any time I was present and I was present at all the hearings on the authorization bill except maybe I went to answer the telephone. It would certainly be helpful. It is something you can put your hand on and hold to guide your way through some other matters.

Do you gentlemen have anything now you wish to say or any points you wish to add?

General Ferguson?

General FERGUSON. I have no more. Thank you, Mr. Chairman.

Senator STENNIS. Sometimes questions will provoke another point or time will run out and you do not get to make your points clearly. General Holzapple, do you have anything further to say?

General HOLZAPPLE. I do not believe I have, sir.

Senator STENNIS. The military is not very strong on giving a volunteer answer.

Mr. Kendall, do you have anything?

Mr. KENDALL. No. I have nothing further, Mr. Chairman.

RED CHINA THREAT

Senator STENNIS. We certainly do thank you, each of you, and those that came with you, too, for your attendance here today. We value your testimony and wish it was not as bad as it was—I mean the picture it presents. I thought your statement was good, and the way you presented it, too, General.

By the way, I do want to go to page 17 of your statement. You refer there to the Red Chinese. Yesterday, we had two other eminent witnesses here and one of them gave one sentence to Red China. That was General McConnell. The other gave two sentences to Red China. That was Secretary Brown. You gentlemen have gone to four sentences today on Red China. I really thought that you would develop that more.

You say that: "The major R. & D. programs there, seemingly proceed at high priority regardless of the cultural revolution." What do you mean by "high priority?" Then you say, "We will continue to watch the developments there very closely."

Well, if you have already watched them very closely, that is, if it is possible to be watching them very closely, it would seem you would have more evidence about it. What is the situation? How closely can you watch them?

General FERGUSON. We have a pretty good idea of the size and the type of weapons that they have exploded so far, the yield of them. I think the remarkable thing, Mr. Chairman, is that they have arrived at the point of actually launching a ballistic missile and exploding a nuclear warhead on the end of it in a relatively short period of time.

Senator STENNIS. That is what impresses me. That is why I thought you gentlemen would be more concerned about it than you seem.

General FERGUSON. Well, we are concerned about it and we are doing everything to follow what they are doing, and as you well know, the defenses that have been proposed and are underway now are really aimed at that particular threat.

Senator STENNIS. Their developments, I suppose, after all, are within the scope of what has already been done by the Soviets.

General FERGUSON. Not necessarily. [Deleted.]

Senator STENNIS. Well, that is interesting. In what particular field was that?

General FERGUSON. Well, I say in the particulars of [deleted].

Senator STENNIS. Well, how much closer can you watch them? [Deleted.]

General FERGUSON. That is right. That is one way. There are other methods. [Deleted.]

RED CHINA'S SCIENTIFIC CAPABILITY

Senator STENNIS. I am not familiar with their relative capacity as scientists. Do they have—I know they have some—but in the field of chemistry and engineering and all, they have not been outstanding, or have they?

General FERGUSON. Yes, they have.

Senator STENNIS. Over the years?

General FERGUSON. A very small group, some of them trained—

Senator STENNIS. Up until post-World War II, say, and then comment on prior to that and then after that. I think we need to know more about it up here on the Hill. I know I do.

General FERGUSON. Yes. They have a very small group of very well trained scientists, trained here and in France and other places. Some of them are now in Formosa but some of them stayed in China or went back to China in the last few years and took with them a lot of relatively modern technology.

Senator STENNIS. Yes. Of course, that is post-World War II you are talking about.

General FERGUSON. I am talking about in the last 10 years.

Senator STENNIS. So, that is where they got most of their training, that is, in the Western World?

General FERGUSON. Yes, I would think.

Senator STENNIS. What about their capacity for the instruments and all that are needed in connection with their scientific work?

General FERGUSON. [Deleted.]

SUPPLY OF INDUSTRIAL EQUIPMENT TO RED CHINA

Senator STENNIS. I understand a lot of these firings and tests now are based on the use of computers and similar complex machines. Where do they get their computers or whatever is necessary in these fine spun instruments?

General FERGUSON. Well, I suppose some of them they can buy but I am sure it is within their capacity to build the ones that they need now.

General HOLZAPPLE. I think until a few years ago they got a great deal of assistance from the Russians, too.

Mr. KENDALL. They also have extensive trade with Japan on industrial equipment.

Senator STENNIS. That they would use in carrying out this military program?

General FERGUSON. I am not sure. They are using standard instruments, I suppose, not instruments peculiarly designed for nuclear tests.

Mr. KENDALL. I was talking about computers and things of that nature.

RED CHINA'S DELIVERY SYSTEMS

Senator STENNIS. Well, I want to know from gentlemen who are really in contact with the scientific end of it. That is very good as far as you go there that they are getting it, say, from Japan, but I think we ought to know more about it. I was very much impressed

when they conducted their test shots. They have a delivery system now, do they not, for about [deleted] ?

General FERGUSON. They fired one test missile [deleted] miles with a [deleted] warhead on it and they have air-dropped [deleted] and they have fired [deleted]. That is nuclear weapons I am speaking of now.

Senator STENNIS. They had a [deleted] mile——

General FERGUSON. Missile, yes.

Senator STENNIS. When they get that to [deleted] miles you can just look at the map and see how much blackmail weight they will have within that area of the world. It covers virtually everything.

All right. I would like to know more about that. Make a note of it, Mr. Kendall, and let us see if we cannot get a further briefing on these points.

General FERGUSON. I am sure General Thomas could give you all the information. He is our intelligence officer on the air staff. He would be a fine source for that information.

Senator STENNIS. All right. If there is nothing further, we thank you very much again for your fine showing.

General FERGUSON. Thank you, Mr. Chairman.

Senator STENNIS. We appreciate very much your cooperation, too.

RECESS

The committee will take a recess now, subject to the call of the Chair.

(Whereupon, at 12:40 p.m., the committee recessed, subject to the call of the Chair.)

STATUS OF U.S. STRATEGIC POWER

WEDNESDAY, MAY 8, 1968

U.S. SENATE,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE OF THE
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee (composed of Senators Stennis (chairman), Symington, Jackson, Cannon, Byrd of West Virginia, Smith, Thurmond, and Miller) met, pursuant to call, at 10:05 a.m., in room 224, Old Senate Office Building, Senator John Stennis presiding.

Present: Senators Stennis, Thurmond, and Miller.

Also present: James T. Kendall, chief counsel; Samuel R. Shaw, and Everette L. Harper, of the subcommittee staff.

CHAIRMAN'S OPENING STATEMENT

Senator STENNIS. The subcommittee will come to order.

I have a brief statement to make, following which Admiral Moorer will be called upon as a witness.

We are approaching the end of our hearings on the strategic posture of the United States. After today, one, or possibly two, more hearings will be scheduled on this matter.

This subject of our strategic weapons and the bombers and missiles and submarines which constitute their delivery systems is enormously complex. Yet an understanding of these systems, of their interrelationship and the national policy that governs their development, deployment and, if necessary, their use, is absolutely essential if the Senate and the House of Representatives are to discharge their constitutional responsibilities.

Members of the subcommittee and, I might add, of the parent Armed Services Committee, have spent many hours during this and other hearings discussing these vital policy questions with key Defense officials. Their probing questions have clarified many issues and contributed to a more complete understanding of the subject. They are to be commended for their attention to a subject which so vitally affects our security.

Without exception, the witnesses who have appeared before us have recognized the need for a force mix of land- and sea-launched missiles and manned aircraft. Such a mix compounds the defense problems of potential enemies and minimizes the risk of our deterrent posture being compromised by an unexpected technological breakthrough by others.

We have heard the Secretary of the Air Force, the Air Force Chief of Staff, and the SAC commander in chief discuss our posture and

capability in ICBM's and long-range bombers. The third primary system for delivering U.S. strategic weapons on an enemy is the nuclear-powered submarine and its POLARIS missile.

Today we are pleased to have with us Adm. Thomas H. Moorer, Chief of Naval Operations, to testify concerning our present posture as well as the programed improvements when the POSEIDON missile becomes operational. Admiral Moorer is accompanied by Rear Adm. G. H. Miller, Director, Strategic Offensive and Defensive Systems; Rear Adm. L. Smith, project manager, Fleet Ballistic Missile; and Rear Adm. E. W. Dobie, Jr., Deputy Director, ASW programs.

Admiral Moorer carries impressive credentials as a naval officer whose career included command of the Pacific Fleet and later the Atlantic Fleet before he assumed his present position as Chief of Naval Operations.

We value your testimony, Admiral Moorer, and appreciate your spending this time counseling with us on these vital questions affecting the Nation's security.

I will add there that the only objection that I see to the speculation in the newspapers about the admiral being made Chairman of the Joint Chiefs is that the Navy needs him and we need him in the position he is in right now.

That is purely a gratuitous comment. I don't get into the channels of appointments, as you know.

Admiral, we are delighted to have had your statement sent over in advance.

Mr. Reporter, I will put a biographical sketch of the admiral in at this point.

(The biographical sketch referred to follows:)

BRIEF BIOGRAPHY OF ADM. THOMAS H. MOORER, U.S. NAVY

Admiral Thomas Hinman Moorer, USN, was born in Mount Willing, Alabama, February 9, 1912. He attended the U.S. Naval Academy and was graduated with a B.S. degree and commissioned Ensign in June 1933. Was designated a naval aviator in June 1936. Attended the Naval War College (1952-1953). Advanced to the grade of Admiral on June 26, 1964.

Admiral Moorer became the eighteenth Chief of Naval Operations on August 1, 1967. Prior to his present assignment he served as: Commander in Chief of the (unified) Atlantic Command and U.S. Atlantic Fleet and NATO's Supreme Allied Commander, Atlantic (1965-1967); Commander in Chief, U.S. Pacific Fleet (1964-1965); and as Commander, Seventh Fleet in the Western Pacific (1962-1964).

He has served in numerous other positions of responsibility both ashore and afloat, including tours of duty on the Staff of the Chief of Naval Operations as: Director of the Long Range Objectives Group (1960-1962); Assistant Chief of Naval Operations for War Gaming Matters (1958-1959); and Special Assistant in the Strategic Plans Division (1957-1958).

Other major assignments include tours as: Commander Carrier Division Six (1959-1960); Commanding Officer, USS Salisbury Sound (1956-1957); and Aide to the Assistant Secretary of the Navy (Air) (1955-1956).

On December 7, 1941, at the outbreak of World War II, he was a PBY Patrol Plane pilot assigned to Patrol Squadron 22 at Pearl Harbor. During World War II, Admiral Moorer also served: in Patrol Squadron 101; as Commanding Officer of Bombing Squadron 132; on the Staff of Commander in Chief, U.S. Fleet in London; and as Gunnery and Tactical Officer on the Staff of Commander Naval Air Force, Atlantic Fleet.

His decorations include: Distinguished Service Medal with Gold Star in lieu of Second Award. For World War II service: Silver Star, Legion of Merit, Distinguished Flying Cross, Purple Heart and Ribbon for the Presidential Unit

Citation. In addition he holds eleven campaign, service and theater medals and has been decorated by seven foreign countries.

Admiral Moorer is married to the former Miss Carrie Ellen Foy of Eufaula, Alabama. They have four children.

Senator STENNIS. You may proceed in your own way; sir, and either read your entire statement or such parts thereof as you may wish.

STATEMENT OF ADM. THOMAS H. MOORER, CHIEF OF NAVAL OPERATIONS, U.S. NAVY; ACCOMPANIED BY REAR ADM. G. H. MILLER, DIRECTOR, OFFENSIVE AND DEFENSIVE SYSTEMS; REAR ADM. L. SMITH, PROJECT MANAGER, FLEET BALLISTIC MISSILE; AND REAR ADM. E. W. DOBIE, JR., DEPUTY DIRECTOR, ASW PROGRAMS

ADMIRAL MOORER'S PREPARED STATEMENT

Admiral MOORER. Mr. Chairman and members of the committee, I appreciate this opportunity to appear before you to participate in discussions of strategic forces matters. As General Wheeler pointed out in his statement before this subcommittee, the most serious military threat to our country today is posed by the growing strategic nuclear offensive forces threat.

There is no question that the Soviets are capable of inflicting severe damage upon the United States in any strategic nuclear exchange.

PRIMARY OBJECTIVE IS TO DETER

Since national survival is clearly at stake, the primary objective of our policy must be to deter a Soviet nuclear attack upon the United States. We recognize that an enemy might seriously consider preparing and initiating war by nuclear attack on the United States, if his own appraisal were to show that he could thereby gain a decisive military advantage. A credible deterrent against such an attack can be achieved by designing and deploying our strategic forces so that we maintain an obvious capability to inflict unacceptable damage on the Soviet Union even after absorbing the impact of a first strike on the United States. Unmistakable evidence that our nuclear offensive forces could not be seriously crippled by a first strike on our country would remove any temptation an enemy might have to try such a strike.

DETERRENCE MIGHT FAIL

However, since deterrence might fail, through miscalculation or commission of an irrational act, our forces must be capable of destroying the enemy's society in retaliation and continuing the attack until hostilities are terminated under conditions of relative advantage to the United States.

INCREASING RISK IN CURRENTLY PROGRAMED FORCE LEVELS

Considering the growing Soviet threat and the emerging Communist Chinese threat, we have been taking a hard look at the adequacy of

the U.S. strategic force mix. We believe that currently programed force levels will place U.S. security interests worldwide at increasing risk, and that strategic forces need to be improved both in size and in composition to insure the accomplishment of their missions. Optimization of our strategic system deployments and mixes needs to be achieved to reduce the risk to the United States itself. I believe that this will require the Navy to make a greater contribution to our overall strategic forces posture.

NAVY OFFICES RESPONSIBLE FOR STRATEGIC SYSTEMS

This is why Navy last year established the Office of the Director, Strategic Offensive and Defensive Systems, as a major staff office under the Vice Chief of Naval Operations for developing concepts and plans for future sea-based strategic offensive and defensive systems.

The Navy is also in the process of expanding the responsibilities of our Special Projects Office and redesignating it the Strategic Systems Project Office. This new organization will provide the much-needed technical support for future Navy strategic systems, just as it now does for the POLARIS/POSEIDON program. These actions are designed to strengthen the Navy's organization for planning and contributing to the U.S. strategic forces posture.

ESSENTIALS OF STRATEGIC FORCES

General Wheeler, during his appearance before this subcommittee, pointed out that our strategic forces must:

1. Be designed to operate over a broad spectrum of possible conditions.
2. Contain a mix of land- and sea-launched missiles and manned aircraft.
3. Contain both active and passive defenses in depth.

NECESSITY FOR OPTIMUM MIX OF STRATEGIC SYSTEMS

Navy analyses confirm the importance of an optimum mix of strategic systems. Some important considerations in determining the systems in the overall U.S. mix are:

First, the capability of the system to survive a Soviet first strike and continue to function with full effectiveness;

Second, the extent to which an attack on the system would result in damage to the United States itself; and

Third, the kind and complexity of response the system would require of the enemy.

MOBILE FORCES ADD TO ENEMY'S PROBLEM

The offensive and defensive problems for the Soviets depend to a large extent on the location of our own nuclear offensive forces. These problems can be made considerably more complex and uncertain by deploying our own offensive forces to attack from many directions and in different trajectories. If the forces are mobile they add to the complexity since they cannot be pretargeted for destruction by a mas-

sive initiative attack. To counter such diversity of attack would require the Soviets to invest more in weapons and systems other than ICBM's aimed only at the United States, and it would reduce the temptation to initiate war by nuclear attack on the U.S. homeland.

ADVANCES IN STRATEGIC WEAPON TECHNOLOGY

In addition to the foregoing operational considerations, we must recognize advances in strategic weapon technology, evident in our opponent's programs, as well as our own. New technology is producing effective ABM systems, improving ASW, and providing more accurate missiles and multiple-independently guided reentry vehicles, which enable one missile to attack several targets.

THREAT TO THE UNITED STATES

In addition, penetration techniques, fractional orbital bombardment capabilities, the large Soviet cruise missile submarine force and the [deleted] of ballistic missile submarines, pose an unprecedented threat to the United States over larger sectors of our defense perimeter.

NAVY'S CONTRIBUTION TO STRATEGIC FORCES POSTURE

The Navy is seeking to design systems, with their inherent advantages of mobility and survivability, which would make substantial contributions to the viability of the U.S. strategic forces posture. Moreover, with each Service studying and analyzing the details of the other's systems, better homework is done on each system. In this way, whatever systems are approved and deployed by our country, they will be more effective in meeting the Nation's strategic objectives.

The 41 ballistic missile submarines the Congress authorized in prior years constitute a very survivable component of our strategic offensive posture today. Turning now to the future, the Navy has conducted extensive studies in a number of strategic forces areas.

POSEIDON MISSILE DEVELOPMENT

The POSEIDON missile, of course, is under development and will be installed, beginning in 1969, in 31 of the present 41 POLARIS SSBN's. When the POSEIDON conversion is completed in [deleted] the proportion of the total U.S. strategic offensive alert force based at sea will have increased from its present [deleted].

If the threat indicates a need for more survivable payload before the [deleted] we are prepared to build more ballistic missile submarines. We can also load each deployed POSEIDON missile with the [deleted].

BALLISTIC MISSILE SHIP

If a rapid buildup of additional survivable payload is needed, one feasible course of action could be to construct and deploy a ballistic missile ship (BMS) force armed with POSEIDON missiles. After completion of design work the first units could be deployed in about [deleted] years after a decision is made to build such a force.

Mention of the ballistic missile ship, of course, brings up the question of survivability. For this reason the Navy has devoted considerable effort to analyzing the survivability of a ballistic missile ship force operating singly, randomly, and undefended in regular shipping lanes. One study was completed by the weapons system evaluation group about a year ago for the Office of the Secretary of Defense. In general, the studies have concluded that the force operating, as I described, would still retain its effectiveness many hours after an attack began; and that it is extremely difficult, as we see it today, to devise a means of knocking out a mobile force at sea quickly by surprise attack. In addition, we can install defense weapons in the ships themselves, and operate them in company with other combat ships, to further increase their ability to survive.

UNDERSEA LONG-RANGE MISSILE SYSTEM

For a follow-on to the present POLARIS/POSEIDON system, we are planning a new submarine system—a result of the STRAT-X study sponsored by the Secretary of Defense. This study looked at a large number of systems for basing an advanced ICBM. Of these, two were sea based, a submarine and a surface-ship system. Four systems were selected in the final analyses and two of these were the sea-based systems.

The new design submarine system has been named ULMS for undersea long-range missile system. The ULMS incorporates advanced design submarines armed with ICBM range missiles. New ideas [deleted] will be examined. This missile will have the range to enable the SSBN's to be on target as soon as they leave port.

SHIP-BASED ADVANCED ICBM

The other Navy STRAT-X system is a new surface ship configuration for carrying an advanced ICBM. The longer range missiles would enable these ships to operate in several ways, and still be within range of their targets. They could operate in U.S. coastal waters, at sea in company with other ships, or in merchant traffic lanes. They could also fire their missiles from ports and harbors. [Deleted.] We visualize this new-design surface ship as an adjunct to the new-design submarine—a means of getting more survivable payload quickly at relatively low cost, in event of necessity.

SEA-BASED BALLISTIC MISSILE INTERCEPT SYSTEM

Regarding anti-ballistic-missile systems, the Navy has one baseline design at this time, SABMIS—a sea-based ballistic missile intercept system. The advantages of a sea-based ABM system are mobility, [deleted], and defense in depth. Our studies show that it is very difficult to pretarget a moving force with sufficient certainty to insure a successful initiative attack. SABMIS ships can also be moved in the numbers desired to the best area for intercept of the prevailing threat. [Deleted.]

Our preliminary calculations show that a SABMIS/NIKE-X defense-in-depth mix would be an effective combination to deal with

future sophisticated weapons that Soviet and Chinese technology will be able to produce.

SABMIS will also have a capability to deploy in distant waters, in defense of our oversea bases [deleted]. Ships can be moved to positions overseas, augmented, reduced, or withdrawn, as necessary to support U.S. policy.

DEFENSE AGAINST SLM'S AND MANNED BOMBERS

We are also continuing to examine better ways that the Navy could contribute to the strategic defense of the United States against attack by submarine-launched missiles, and bombers approaching over the ocean areas.

This, then, is a brief look at the Navy's concepts for future strategic forces programs. We are convinced that more extensive use of the oceans for deployment of strategic weapons systems will increase the ability of our country to survive in the nuclear age.

NECESSITY FOR BALANCED OFFENSIVE AND DEFENSIVE SYSTEMS

We believe that the best strategic posture is a well-balanced offensive and defensive combination, balanced in distribution over available land and sea areas, as well as with respect to individual system capabilities. In an area of essentially comparable technology, it is essential to our country's survival that we be as close to optimum as humanly possible in our strategic system design, our selection of system mixes, and in our overall deployments.

Mr. Chairman, that completes my statement.

STATUS OF NAVY'S PROPOSED PROGRAMS

Senator STENNIS. All right. I think we will have at least one round of questions by the members, and then we will call on Mr. Kendall.

Admiral, on page 8, among the last matters you mention, you say, "We are also continuing to examine better ways that the Navy could contribute," and so forth. What do you mean by the word "examine"? Aren't you further along on SABMIS than just examining its possibilities? What do you mean by "examine"? Do you mean just continue to look ahead to see what the possibilities are?

Admiral MOORER. Yes, sir. For instance, we are conducting exercises to determine the best means of [deleted]. This is in addition to SABMIS.

DEFENSE WEAPONS IN SHIPS

Senator STENNIS. On page 5, down at the bottom, you said: "In addition, we can install defense weapons in the ships themselves and operate them in company with other combat ships, to further increase their ability to survive." Just illustrate what do you mean by "defense weapons in the ships themselves." Does that include detection devices?

Admiral MOORER. Yes, sir. You would expect these ships to be attacked by aircraft or by other submarines, or perhaps by surface ships, and what I had in mind there was the installation of detection devices, both surface as well as undersurface, and in addition to

that, weapons which could be used against any attack; namely, surface-to-air missiles or undersea weapons.

SURVIVABILITY OF BALLISTIC MISSILE SHIP

Senator STENNIS. That is part of the purely defensive concept. I understand that.

You also say that one study on the ballistic missile ship and its survivability was completed about a year ago. Then you said: "In general, the studies have concluded that the force operating, as I described, would still retain its effectiveness many hours after an attack began."

What do you mean by "many hours"—6 hours, 12 hours, or what?

Admiral MOORER. Well, sir, a sufficient number of hours to permit the ship to fire all of its weapons, which I think is the key point.

Senator STENNIS. Yes.

SHIPS AT SEA CANNOT BE PRETARGETED

Admiral MOORER. We are continually, of course, discussing the vulnerability of ships at sea. The key point is that ships are mobile, and they cannot be pretargeted by ballistic missiles. Consequently it is almost impossible to schedule at a precise time an attack on a specific ship, because before the attack can be initiated, the ship must be located in a very finite sense, and consequently any war game or study that we conduct involving ships at sea always concludes that a large number of them will survive for some time, sir.

Senator STENNIS. So you really think that you can survive, and that knocking out our mobile force at sea by a surprise attack would be extremely difficult. Do you mean that you think an enemy would have a remote chance to do that?

DISPERSAL AND MOBILITY OF SHIPS

Admiral MOORER. I mean by that, sir, that these forces would be widely dispersed. They would be mobile, and consequently it would take a considerable length of time to destroy a significant number of them. I am not saying in any sense that a ship is not vulnerable, because everything is vulnerable.

Senator STENNIS. Yes.

Admiral MOORER. But vulnerability is all relative.

Senator STENNIS. With respect to jamming your devices and all that are necessary in your firing, [deleted].

Admiral MOORER. Yes, sir. [Deleted.]

ULMS IN CONCEPTUAL STAGE

Senator STENNIS. I asked that question because it always seemed to me about our land-based ICBM's that that is the most vulnerable spot for us, the possibility of affecting their instrumentation.

How far along is ULMS?

Admiral MOORER. It is in what you would call the conceptual stage, Senator. We have, I believe, [deleted] million in the 1969 budget to

pursue this, with the idea that if this develops well, then we would seek funds for contract definition. But what this really is is an advance POLARIS/POSEIDON submarine.

Senator STENNIS. You are looking forward?

Admiral MOORER. Yes, sir.

Senator STENNIS. Further along down the line.

Admiral MOORER. Yes, sir.

NEW SURFACE SHIP IS IN STUDY STAGE

Senator STENNIS. There is a little bit more down-to-earth language on your next item. You said that "The other Navy STRAT-X system is a new surface ship configuration." How far along is that?

Admiral MOORER. That is just in the study stage, sir. The idea here, we mentioned two ships. One would use the POSEIDON missile, and would provide us a means of acquiring a capability in a hurry today, and the second ship mentioned in the STRAT-X study would employ the same missile that is envisaged for the advanced submarine.

Senator STENNIS. I am very much interested in your proposed anti-ballistic missile system. I will let someone else question you about that.

Senator Thurmond, may I call upon you for one round of questions now, anyway?

OPTIMUM NUMBER OF SSBN'S NEEDED

Senator THURMOND. Thank you, Mr. Chairman.

Admiral Moorer, we are glad to have you with us. In your statement you mentioned 41 POLARIS SSBN's as a finite number. Has the Navy ever conducted studies to determine the optimum number of SSBN's needed, and if so, would you discuss some of the results of these studies?

Admiral MOORER. Well, we have made several studies as to how many were needed, sir. This, of course, is in connection with the contribution of these submarines to the overall mix of the strategic forces.

I don't think that I have seen a number advanced in specifics. Perhaps Admiral Smith might be able to add to this. But we have not come up with a study that indicates additional submarines.

However, in light of what I said about the advantage of deploying our forces in such a way that the enemy would be confronted with attacks from many directions, there is no question about the fact in my mind that additional submarines would improve the effectiveness of our strategic forces.

SOVIETS TAKE "DIM VIEW" OF SURFACE BALLISTIC MISSILE SHIP

Senator THURMOND. I note from Soviet military writing that Soviet authorities take a dim view of the surface ballistic missile ship. For example, Red Star carried in its February 15, 1963 issue an article entitled "The Revolution in Military Affairs and its Results" by Gen. N. A. Sabito with regard to submarines in a strategic role. The general said:

The revolution in military affairs has brought changes to our Navy. Its basic strength is the submarine of various designations which is incomparably more effective in nuclear rocket war than a surface ship.

Now, in your studies of the ballistic missile ship, how did the survivability of the BMS compare with the SSBN?

SUBMARINE IS MORE SURVIVABLE THAN BMS

Admiral MOORER. Senator, may I say first that I would expect the Soviets to make such a statement as that, because of the difference between our position and theirs with respect to geography. They do not have the latitude that we have to operate naval forces at sea.

With respect to your second question, "How do they compare?" there is no question about the fact that the submarine is more survivable for a longer period of time. I think that is the point.

The submarine at the same time is more expensive. We were suggesting the surface ship as a means of providing additional throw weight over and above the submarine force, and as I said in my statement, we feel that it will survive certainly for a sufficient time to permit it to carry out its mission in a nuclear exchange.

COST EFFECTIVENESS OF THE BMS VERSUS SSBN'S

Senator THURMOND. Admiral, would you discuss the relative cost effectiveness of the BMS and the SSBN?

Admiral MOORER. Well, I think again, sir, that we would require a mix, because in the first place the submarine can be positioned in many places that it would not be desirable to position the ballistic missile ship. So in terms of cost effectiveness, I believe both of them are cost effective. In terms of cost alone, the ballistic missile ship can be procured for less cost.

NAVY'S WAR GAMES IN STRATEGIC AREA

Senator THURMOND. Admiral, have any of the Navy war games or studies been directed toward utilization of our strategic forces [deleted].

Admiral MOORER. We have considered that, Senator Thurmond, and we have planned to provide for such a task.

USE OF SSN IN DAMAGE LIMITING ROLE

Senator THURMOND. Admiral, would you discuss the use of our nuclear attack submarine in a damage limiting role? Do you use this capability or the SSBN as an argument for continued construction of new generation attack submarines?

Admiral MOORER. This is the subject I touched on with the chairman, sir, and that is that [deleted].

UNMANNED STRATEGIC PLATFORMS IN SPACE

Senator THURMOND. Admiral, have any of your studies investigated the feasibility of unmanned strategic platforms, either fixed or mobile, in inner space, and by this I mean platforms capable of launching POLARIS or POSEIDON missiles on remote command?

Admiral MOORER. We have done some studies in this field, Senator, but they are just in the conceptual stage, of course.

LEADTIME FOR SABMIS

Senator THURMOND. Admiral, I am very interested in your SABMIS, your sea-based ballistic missile intercept system, because I think that it is most important to develop a [deleted]. If the Navy were given the go-ahead for developing a prototype, how many years would it take to produce an operational unit?

Admiral MOORER. Well, sir, we have established milestones which would indicate that we could commence evaluation of the system following sea trials by [deleted] and consequently this would mean that we could probably deploy in [deleted], sir.

VULNERABILITY OF SSBNS

Senator THURMOND. Admiral, to what extent is the SSBN vulnerable to the development by the enemy of the capability to calculate the SSBN position through analysis of the incoming missile trajectory?

Admiral MOORER. I don't feel, sir, that the submarine is vulnerable from that point of view. [Deleted.]

Perhaps Admiral Smith could add to that.

Senator THURMOND. Admiral Smith, do you care to add anything to that?

Admiral SMITH. [Deleted.]

NAVY'S CONTRIBUTION TO STRATEGIC DEFENSE

Senator THURMOND. Admiral, what contribution can the Navy make to strategic defense with its present equipment?

Admiral MOORER. With the present equipment, sir, we can, of course, conduct antisubmarine warfare against the enemy ballistic missile firing submarines, and also cruise missile firing submarines, and in addition to that, we can, by using our aircraft carriers, intercept those bombers that overfly the oceans, before they reach the shores of the United States.

MOORER'S RECOMMENDATIONS FOR IMPROVING NAVY'S STRATEGIC POSTURE

Senator THURMOND. Admiral, given unlimited funds, what would you personally recommend that the Navy develop to improve our strategic posture?

Admiral MOORER. I would recommend, sir, that we go ahead at best speed on the SABMIS, and that we also build a prototype ballistic missile ship, and proceed with the development of the advance submarine.

Senator THURMOND. Those are the three things that you give priority to?

Admiral MOORER. Yes, sir.

Senator THURMOND. Thank you very much, Admiral.

Senator MILLER, do you have some questions?

NEED FOR MORE SURVIVABLE PAYLOAD

Senator MILLER. Thank you.

Admiral, I just have one area that I want to explore a bit. On page 5, in the second full paragraph, you say: "If the threat indicates a

need for more survivable payload before the [deleted]—you imply by that, I assume, that the present evaluation of the threat does not so indicate.

Admiral MOORER. That is true in quantitative terms, sir. On the other hand, in terms of trends, I think it presents another problem, and this is why I indicated, I mean I stated, "If the threat indicates a need." In other words, if the trend continues. I think today we do have, we obviously do have, the Soviet deterred, but at the same time they are going ahead with building more ICBM's, building an [deleted]. They have improved their defenses. They have developed the FOBS, and on top of that they have made considerable progress in improving the posture of their general purpose conventional forces, all of which add together to provide a system that permits deterrence.

Senator MILLER. I don't want to quibble over semantics, but it seems to me that there is a threat now. Here you have a trend, and there is evidence that the trend is continuing. It seems to me that that would be a threat, and you don't have to say "if." You could simply say that the threat indicates a need for this. If we just wait, maybe we will wait too long before we determine whether the trend is going to continue. Since all indications are that the trend is continuing upward, unless something very dramatic occurs, it seems to me that we have a definite threat and we have to prepare for it. I take it that that is your view.

Admiral MOORER. Yes, sir.

RISK ON CURRENTLY PROGRAMMED FORCE LEVELS

Senator MILLER. One thing that alarms me is the statement on page 2 where you say, in the second paragraph:

We believe that currently programmed force levels will place U.S. security interests worldwide at increasing risk.

That clearly infers that our current programs are inadequate, and we certainly do not wish to be subjected to an increasing risk. If anything, we would prefer to decrease the risk rather than to let it increase. It seems to me that your evaluation of our current programs, looking down the road, is that they are inadequate, unless you think that we should accept the increasing risk, which I trust you don't.

Admiral MOORER. No, sir. I think that they are inadequate if the trends continue, and for this reason, we are going ahead with the development of the various types of systems, not only in the Navy but also in the Air Force and Army as well, which you have heard about, so that we will be prepared to respond to this increased threat.

Senator MILLER. I am impressed by your statement, may I say, and I like the concepts that you discussed. However, when we look at our programmed force levels from 1969 up through [deleted] and the Chief of Naval Operations looks at those programmed force levels and says, "I am sorry, gentlemen, but U.S. security interests worldwide will be placed at an increasing risk if we go on with that program," that indicates a very serious deficiency in the program.

Admiral MOORER. Well, sir, I do think, as I said, that looking into the future, this can come about. I don't think there is—

Senator MILLER. I know you said that, Admiral, but you also say here, "We believe that currently programmed force levels will place U.S. security"—not "may" but "will"—"interests worldwide at in-

creasing risk." To me that is an indictment of our current program and currently programed force levels.

I am not saying I disagree with you at all on it, but I do want to make clear that you and the Navy Department are apparently very concerned that our currently programed force levels are not adequate to prevent an increasing risk to our national security.

Admiral MOORER. I want to repeat, sir, that I think that if the trends continue, this is the case. I think again, as I indicated, that we should deploy more of our forces outside the United States, so as not to attract attack on the United States, so as to have a survivable force, and, therefore, not tempt the Soviets to think that they might be able to gain a significant advantage by going first, and also by having a widely dispersed force require the Soviets to put a large part of their resources into defense.

At the moment they are looking at a rather [deleted] for the weapons that are going to attack them.

NEED TO IMPROVE SIZE AND COMPOSITION OF FORCES

Senator MILLER. Your statement on deployment and dispersal certainly rings a bell with me, but I want to make sure I understand your statement. As I read that statement, that sentence on page 2, you state your belief that the currently programed force levels, regardless of where they are deployed or dispersed, will place our security interests at increasing risk, and that we have a need to improve both the size and the composition of those force levels. This apparently is not programed.

I interpret that to mean that you are advocating an enlargement of the forces, both quantitatively and qualitatively, and the Congress should know this if it is going to do its part in preventing an increasing risk to the United States.

Admiral MOORER. Well, sir, the JCS have discussed this in detail, and we have recommended that we go ahead with the concept formulation and the contract definition of these various weapons systems that I have mentioned, that General McConnell has mentioned, and that I am sure that General Johnson will mention.

ARE PRESENTLY AUTHORIZED PROGRAMS ADEQUATE?

Senator MILLER. Do you believe that the programs authorized by the Congress are inadequate quantitatively and qualitatively to prevent this increasing risk?

Admiral MOORER. Well, sir, we haven't reached the stage yet where we have actually come forward with a production program for these weapons which I mentioned to you, and so our first step is to do the necessary research and development and the necessary evaluations to permit us to come forward with a viable program, and, therefore, to date the Congress has not had an opportunity to say yes or no on the type of things that I am talking about.

Senator MILLER. Then what you are really saying is that our currently programed force levels are not going to be adequate to prevent an increasing risk, but that our programs for R. & D. and test,

evaluation, and so forth, are going to be timed so that these programs can be authorized in time to prevent that risk from taking place.

Admiral MOORER. That is what we had in mind, sir.

Senator MILLER. All right, thank you very much, Admiral. That is all the questions I have.

DISCUSSION OF PROSPECTIVE SUBCOMMITTEE REPORT

Senator STENNIS. Thank you, Senator.

I want to say just a word in the presence of the members of the subcommittee about the report that we will have on this matter. My idea is that we should write a report with some definite conclusions in it. Possibly some parts of the report should not be written with a view to having them published. Perhaps we can contribute more with a report in which certain major conclusions would be classified. Some of our conclusions—I am not referring to what you have just been saying, discussing, Senator Miller, but I think you were hitting at some of the main points—but some of our conclusions or recommendations could be published. But I want to have a real report that has something in it to cover those points you have just raised.

Yes, Senator?

Senator MILLER. May I say I thoroughly agree with the chairman on that, but there are some people, and I am afraid there are some in the Defense Department, there are some in the Congress, who apparently are not quite aware of the seriousness of the situation, and I would hope that some releasable extract from that report could be made public, so that there won't be any euphoria among the general public.

Senator STENNIS. I think we can make enough public to alert the people, but we want to hit harder and in more detail than a report that could be released in its entirety. I was not referring to your questions. I had these points on a memorandum for myself. I meant to say that before the testimony started.

PATH OF U.S. ICBM ATTACK

Put that first picture back on the screen for a minute, Admiral, and have someone point out to us just where those different areas are located. My geography is blurred a little after these years. We didn't have time. Just point out a little. If you don't have a pointer, that is all right. You can stand there and do it.

Admiral MOORER. This represents the attack from the United States, the ICBM's. A majority of our weapons come down this path here, which I think represents about 9 percent of the total arc that the Soviets are interested in.

Senator STENNIS. Trace its course. Where is Florida on the map?

Admiral MOORER. Right here, sir.

Senator STENNIS. That is what I thought.

SEA-BASED SYSTEMS COMPLICATE SOVIET PROBLEMS

Admiral MOORER. This is going right over [deleted] which is at the top of the chart, and what I was showing here is that if we only attacked from the United States, then the Soviets have a very simple

defense problem, since they are looking just at a [deleted] and I was pointing out that the sea-based systems operating in the Atlantic, this is the Norwegian Sea and this is Iceland, in the Mediterranean and in the Indian Ocean and up here in the Pacific Ocean would then present the Soviets with the necessity to look in every direction for their defenses.

Senator STENNIS. Five fronts at least.

Admiral MOORER. Yes, sir.

Senator STENNIS. Five major fronts.

Admiral MOORER. Right.

Senator STENNIS. All right.

Are there any questions, gentlemen, about this? It makes it a whole lot clearer to be certain we know just where everything is.

Senator THURMOND. As I see it from your picture there, four out of the United States and one from the United States.

Admiral MOORER. That is true, sir.

Senator STENNIS. All the others are sea based.

Admiral MOORER. These are all the sea based. This is the attack from the land-based missiles in the United States.

Senator MILLER. May I ask a question on that?

Senator STENNIS. Yes, sir.

Senator MILLER. Do the Soviets have a similar range of options open to them, too?

Admiral MOORER. They have, of course, the option of attacking us from the Atlantic and the Pacific, Senator.

Senator THURMOND. And they have got Cuba.

Admiral MOORER. They would have Cuba; yes, sir.

Senator THURMOND. Which is right near us.

Senator MILLER. And, of course, over the North Pole.

Admiral MOORER. And if they chose to use the FOBS, of course, that would come in from the south.

Senator STENNIS. All right, gentlemen, if it is agreeable to the subcommittee now, we will call on Mr. Kendall and he can pursue the major points that he has in mind.

U.S. PRESENT AND FUTURE CAPABILITIES

Mr. KENDALL. Admiral, I want to follow up on Senator Miller's line of questions for just a moment. We asked General Wheeler whether he thought we had a real and present capability to absorb a first strike, and then respond with force to inflict intolerable damage on the aggressor, and then we asked him whether under present force planning, he was satisfied that this capability would be preserved. He responded in this fashion:

With respect to future capabilities, the JCS have recommended force levels and options which would preserve this capability. The dynamic nature of relative capabilities requires that force levels and objectives be reviewed frequently and decisions rendered.

This is the important thing:

[Deleted.]

I was wondering if you agreed with that statement, and what your thoughts were with respect to it, sir.

Admiral MOORER. Yes, sir; I agree with it, and that is what I had in mind in my statement, because based on the superiority comparisons, if you want to call it that, looking at 1968, and selecting one item that adds up to make the total equation as to capability, for instance, missile launchers, in 1968 we have 1,710, and the U.S.S.R. has [deleted]. But in 1976 it is estimated by the intelligence experts that the United States will have [deleted] and the U.S.S.R. [deleted] and we could make similar comparisons in terms of weapons, megatons, equivalent megatons, and so forth.

LOSS OF EXPLOITABLE SUPERIORITY

Mr. KENDALL. Up until 1964, at least, we had a clear and exploitable superiority over the U.S.S.R. in the field of strategic weapons. As you have already pointed out, since that time that superiority has been eroded. As I recall the testimony from the intelligence people, by the end of this year or early next year, the Soviets will approach [deleted].

It seems to me that, rather than deploying additional weapons, we are responding to this threat primarily with proposed qualitative improvements in our nuclear weapons, and, in many cases, such as MIRV, and drastically improved accuracy, the technology is really not yet in hand. In other words, we haven't even flight-tested them.

Do those facts give you any concern for either the present or future security of this country?

Admiral MOORER. It gives me concern for the future, Mr. Kendall, unless we go ahead and make the developments and produce the new forces. In other words, what I am saying is that I do not think we can stop where we are today and rest upon our oars.

POTENTIAL VALUE OF GREATER THROW-WEIGHT OF SOVIET ICBM'S

Mr. KENDALL. In discussing both the present and the future, Secretary McNamara has downgraded both megatonnage and number of warheads as measures of the balance of nuclear power. He feels that the number of warheads on target is a better measure.

Let's assume that this is true in our projections for the future. Isn't it also true that the admittedly greater throw weight which the Soviets have, particularly with the [deleted] missile, gives them the potential, assuming that they develop the technology of MIRVing and such things, say, [deleted].

Admiral MOORER. That is true, Mr. Kendall.

DAMAGE LIMITING AS A FEASIBLE U.S. STRATEGY

Mr. KENDALL. Turning to our policy for a moment, the clear implication of Secretary McNamara's testimony before the Senate Armed Services Committee this year is that damage limiting is no longer a feasible strategy, in view of the growing Soviet missile capability and the Soviet capability to produce additional offensive or defensive weapons in response to any of our future deployments.

Do you agree that damage limiting should be ruled out altogether in the procurement and deployment of weapons, or is damage limiting

a feasible strategy or policy that we can exploit to our advantage for the future?

Admiral MOORER. Well, I think our attack plans should certainly include targets which contain forces which can attack the United States. Also, I would say, of course, that damage limiting is achieved two ways: One, by attacking the enemy weapons before they can be launched; and two, by destroying them once they are in the air.

Of course, associated with the defense, such passive means as bomb shelters and things of that kind. But I feel that we must not only have assured destruction, but we must also take all the actions we can to limit the damage.

SHOULD U.S. SETTLE FOR LESS THAN SUPERIORITY?

Mr. KENDALL. Some people, Admiral, have almost stopped talking about superiority or the possibility of superiority in the strategic weapons field. For example, Dr. Enthoven said that in his judgment superiority in itself was not important, as long as we maintain what Dr. Foster referred to as "a margin of strategic safety," and thus kept an assured destruction capability.

That seems to mean that perhaps some people, at least, are willing to settle for something less than superiority; perhaps even parity. How do you personally feel about this?

Admiral MOORER. I feel that superiority has, of course, many facets, in terms of the weapon characteristics, the command and control systems, the defensive systems, and so on. But philosophically speaking, I feel very strongly that we should have both the offensive and defensive forces that will permit us to conclude a nuclear exchange to the relative advantage of the United States.

TIME FOR MAKING NECESSARY DECISIONS TO PROTECT U.S. POSITION

Mr. KENDALL. As you project the United States and Soviet strategic programs, and recognizing that we don't know what the Soviets are doing, and the great uncertainty in this field, and recognizing also that the decisions we make today affect not only our posture tomorrow but the day after tomorrow, at what point in time do you think we have to make the necessary decisions to assure that we are going to be in an acceptable position as against the Soviets, say, in 1975 or 1976?

Admiral MOORER. Well, I believe, as General Wheeler indicated, sir, we have many systems under development now, which will fit into the overall strategic mix, and I think that these should be introduced as quickly as technically feasible, if the threat trend continues as it has in recent years.

NECESSITY FOR CHANGE IN CIVILIAN POLICY

Mr. KENDALL. Basically, doesn't this really require a change in the basic concept or policy governing our approach to the matter? As I say, the decision to procure and deploy strategic weapons is controlled primarily by the assured destruction criteria.

Dr. Enthoven, for example, and I assume he was enunciating what the policy is on the civilian side of the house, said that he didn't be-

lieve that we should invest large amounts of our resources to procure the capability to perform the other three strategic missions, these being limited and controlled retaliation, damage limiting, and preemptive or full-strike capability.

If that is the national policy, in order to get to the point in the future that you and General Wheeler say we ought to be, doesn't it really mean that from the civilian side of the house the policy is going to have to be changed?

Let me add one further thing. As I understand the situation, measuring our forces solely by the assured destruction capability as has been outlined, we already have enough to perform that mission under almost any conceivable circumstances. Would you comment on these things?

Admiral MOORER. I think you are quite right in saying that we have adequate forces for the mission you just mentioned, assured destruction. So far as the others are concerned, that is, the damage limiting, I don't think that it is prudent to ignore that, and I think we should give emphasis to both aspects, both the offensive and defensive aspects, of damage limiting.

Mr. KENDALL. Then you would agree that since assured destruction is the policy, at least from the civilian side of the house, that in order to make the improvements that you and the Joint Chiefs deem necessary, and gain approval for damage limiting deployments, it is going to take a change in policy?

Admiral MOORER. I think this is a matter of emphasis, Mr. Kendall. It is true that assured destruction has been given emphasis, but at the same time in the plans themselves, we include both assured destruction and damage limiting tasks.

FORCES NOT BOUGHT FOR DAMAGE-LIMITING ROLE

Mr. KENDALL. Yes, sir; I understand that, but that is how you military people are allowed to program the use, the forces you have, and basically, as has been said, we are not buying forces for the damage-limiting role. You can use the forces that you have for damage limiting to the extent that they are left over after having filled the assured destruction requirement, but we are not buying forces for damage limiting. We are going through the R. & D. process which hopefully will provide us with options to react once Soviet developments become known.

My question is, No. 1, if we are going to buy these damage limiting things that you military people have recommended, it seems to me that the policy—the national policy as distinguished from military policy—will have to be changed, and second, that we are running some degree of risk in assuming that our R. & D. options will really be viable after the Soviet threat becomes known.

Admiral MOORER. I think that we are going ahead in some fields. For instance, I mentioned POSEIDON and its installation in 31 submarines. This will, of course, increase the warhead availability. But at the same time I think that when a weapons system is ready for contract definition and production, of course we should and will give that close consideration, and make recommendations accordingly.

The systems that I mentioned, of course, are not completely funded at this time. They are only funded for study purposes, and as I tried

to emphasize, of course, the Navy's interest is in providing forces at sea, in order to spread out this concentration of strategic forces that are currently in the United States.

SOVIET DEVELOPMENTS WHICH MIGHT UNSETTLE BALANCE OF POWER

Mr. KENDALL. In your judgment, Admiral, what Soviet developments in the form of either quantitative or qualitative advances in either offensive or defensive strategic weapons would be most unsettling of the balance of power?

Admiral MOORER. I think it would be a combination. As I indicated, they are already building hard ICBM's. We know now that they have [deleted] a new submarine [deleted]. I think that is going to [deleted]. They have developed the FOBS. We know that they have put a large defensive system around Moscow, and so, I think, in combination, these things all cause concern, because they, of course, determine the relative advantage which might ensue, following a nuclear exchange.

Mr. KENDALL. Of course, such things as MIRVing and drastically improved accuracy of their missiles must also be considered.

Admiral MOORER. If they MIRVed, [deleted], and at the same time provide drastically improved accuracy, as you suggest, of course this would greatly increase the threat.

[Deleted.]

(Discussion off the record.)

INVULNERABILITY OF POLARIS SUBMARINES

Mr. KENDALL. Back on the record.

Admiral, we have put a great many of our chips on the invulnerability of the POLARIS submarines. Do you have a high degree of confidence that this invulnerability will be maintained, and what options do you foresee in the event of a technological breakthrough on the part of the Soviets that would reduce or eliminate the invulnerability?

Admiral MOORER. I have a very high confidence that this will be maintained, for several reasons.

[Deleted.]

INVULNERABILITY OF SOVIET SSBN'S

Mr. KENDALL. Is the other side of the coin also true? Does this mean that the Soviet POLARIS-type submarines are also invulnerable, or relatively invulnerable?

Admiral MOORER. They are certainly more invulnerable than fixed forces, [deleted].

SMALL MIRV WARHEADS AS HARD-TARGET KILLERS

Mr. KENDALL. Admiral, if we are unable to achieve the projected CEP [deleted] for the MIRVed MINUTEMAN warheads and the even lower CEP promised for MIRVed POSEIDONS, wouldn't it appear that we will be left with virtually no hard target kill in our missile forces, except for the TITAN II's, which at one time were scheduled to be phased out?

Admiral MOORER. That is true. If we are unable to achieve the accuracy, and the Soviets harden their missile sites, what you say is quite true, Mr. Kendall.

Mr. KENDALL. Even with the accuracy projected for the POSEIDON, with its—what is it, [deleted] warheads, is that what we are talking about for POSEIDON—

Admiral MOORER. Yes, sir; [deleted].

Mr. KENDALL. I was going to ask whether, even with a [deleted] CEP, it isn't true that those small warheads would give you a very low [deleted].

Admiral MOORER. That is right.

Mr. KENDALL. Of a hardened target.

Admiral MOORER. Yes, sir.

Admiral SMITH. But you still have the option of applying more than one on the same target.

REQUIREMENT FOR LARGER ICBM

Mr. KENDALL. In view of this, do you foresee a requirement by the United States for an ICBM with a greater throw weight than MINUTEMAN provides? What would be the advantages of such a missile?

Admiral MOORER. [Deleted.]

Mr. KENDALL. I think you agree, I assume, that we do need a hard-target killer in our inventory.

Admiral MOORER. I certainly think we need that capability; yes, sir. [Deleted.]

THIRTY-ONE POLARIS APPROVED FOR CONVERSION TO POSEIDON

Mr. KENDALL. As I understand it, you have gotten approval to convert 31 of the 41 POLARIS boats to POSEIDON; is that correct?

Admiral MOORER. That is correct.

Mr. KENDALL. What is the status of the other 10 boats?

Admiral MOORER. The other 10 will be fitted with the A-3 missile.

Mr. KENDALL. Has the decision been made? The last I heard, it was sort of hanging up in the air. I believe that at one time there had been the decision that they would go out. Then it was decided that there was really no reason to make a decision at this particular time and it, therefore, has been sort of hanging in the air.

Admiral MOORER. I think there has been some discussion along this line, but certainly nothing official. As Chief of Naval Operations, I am not aware of this.

CHEAPER TO BUILD NEW SUBS THAN TO CONVERT OLDEST 10 SSBN'S

Mr. KENDALL. These 10 boats you are talking about that won't be converted are the first, the oldest 10, as I understand it.

Admiral MOORER. That is correct, sir.

Mr. KENDALL. Can they be converted to POSEIDON, without exorbitant costs? Is there a technical problem?

Admiral MOORER. I think it would be better to build new submarines, but I will defer to Admiral Smith on that.

Admiral SMITH. It would certainly be cheaper to build new submarines.

Senator STENNIS. To build what—new ones?

Admiral SMITH. New submarines.

NAVY'S PLAN IS TO CONVERT OLDEST 10 TO A-3 MISSILE

Mr. KENDALL. You are saying that the Navy's plan is that these 10 boats will be converted to the A-3 missile, is that right?

Admiral MOORER. That is right.

Admiral SMITH. Five already have.

Admiral MOORER. Five already have. We are talking about converting the other five.

Mr. KENDALL. I am talking about these earlier 10.

Admiral MOORER. Yes, sir.

Admiral SMITH. Five of the 10 have already been converted.

Mr. KENDALL. Then you would convert the other five to the A-3 missile?

Admiral SMITH. Right. The Navy proposes to convert them to carry the A-3 missile.

Mr. KENDALL. [Deleted.] I wonder if you would discuss this threat briefly and tell us what the Navy is doing in the field of ASW to counter it?

Admiral MOORER. Yes, sir.

[Deleted.]

SLBM WARNING SYSTEMS

Mr. KENDALL. Does your ASW effort in any way interface with NORAD's SLBM warning system?

Admiral MOORER. [Deleted.]

Mr. KENDALL. You get assistance from them?

Admiral MOORER. Yes.

Mr. KENDALL. Let's look at the SAGE radars which have been modified to give NORAD an SLBM warning system from the reverse side of the coin. How effective would they be against a POLARIS-type missile?

Admiral MOORER. [Deleted.]

Mr. KENDALL. And, of course, [deleted] all that would do would be to give warning and hopefully some opportunity for things like [deleted].

Admiral MOORER. The radar is purely a warning device; yes, sir.

ULMS INVOLVES BOTH NEW SUB AND NEW MISSILE

Mr. KENDALL. In your statement, you mentioned the undersea long-range missile system. As I understand it, that concept involves the development both of a new submarine and a new ICBM sea-launched; is that right?

Admiral MOORER. That is correct.

Mr. KENDALL. How much leadtime is involved in those two developments? In other words, if you got the "go" word now, when could you go operational with it?

Admiral MOORER. [Deleted] provided we conducted the contract definition in 1970.

NEW SURFACE-SHIP CONCEPT

Mr. KENDALL. Would the new surface-ship-launched ICBM system that you mentioned in the last paragraph on page 6 utilize the same ICBM's as the ULM system?

Admiral MOORER. That would be the idea, essentially the same missile.

Mr. KENDALL. Would this new surface ship concept require a new type of ship or could existing vessels be modified to take an ICBM?

Admiral MOORER. It would be cheaper and better to build one from the keel up, Mr. Kendall, although we have, of course, fired missiles from surface ships, from the U.S.S. *Observation Island*, and so on. But our intent in this case would be to build a new ship.

SABMIS WOULD UTILIZE EXISTING TECHNOLOGY

Mr. KENDALL. Going to SABMIS, the sea-based ballistic missile intercept system you discussed, would that use basically the same technology being developed for NIKE-X and SENTINEL, or are we getting into new technological fields?

Admiral MOORER. No, sir; so far as the radars and detection systems are concerned, they would use essentially the same type systems used by NIKE-X, and so far as the missile itself is concerned, we would propose to use the POSEIDON missile. So we would simply marry together two systems that have already been explored in depth.

SIZE OF PROJECTED SABMIS FORCE

Mr. KENDALL. In your preliminary calculations for the SABMIS NIKE-X system in depth, how big a SABMIS force do your studies show would be required to constitute an effective defense?

Admiral MOORER. We would want to deploy them perhaps in [deleted].

In addition to that, the ships could contribute to the defense [deleted].

So, in order to do this, we would need a sufficient number of ships to maintain on station on a continuous basis.

As to numbers, this would go anywhere from [deleted] depending on how many doors you were guarding.

OPERATIONAL DATE FOR SABMIS

Mr. KENDALL. [Deleted.] Given the present state of technology and the need to design and build new ships for SABMIS, when could this system be operational under optimum conditions?

Admiral MOORER. I think I reported before that we would, I think I said [deleted] with some of the tests being in [deleted] and the deployment in [deleted].

COST COMPARISON OF SABMIS AND NIKE-X

Mr. KENDALL. Have you made any cost comparisons between this system and the NIKE-X system? If so, what was the result?

Admiral MOORER. We have made cost comparison in terms of the number of missiles required to destroy an enemy missile. In other words, in view of the fact that I mentioned that the [deleted].

Mr. KENDALL. [Deleted] to one what? I didn't quite get the context of that.

Admiral MOORER. To be more specific, [deleted].

MOORER SUPPORTS AMSA CONTRACT DEFINITION

Mr. KENDALL. As a member of the Joint Chiefs of Staff, Admiral, what is your position regarding the need for an advanced strategic aircraft?

Admiral MOORER. I think that we need to certainly conduct contract definition on that aircraft, in order to go ahead with production, if the contract definition so indicates. I support contract definition in the meetings of the Joint Chiefs of Staff.

Mr. KENDALL. Do you feel that our failure to proceed with development of AMSA for incorporation into the strategic force is one of those factors which, in your words, "place U.S. security interests, worldwide, at increasing risk?"

Admiral MOORER. Yes, I believe that we should certainly go ahead with the development of this aircraft, and at least proceed far enough to permit us to go into production, if we so desire.

MOORER ADVOCATES BUILDING BMS PROTOTYPE

Mr. KENDALL. Just what decision do you advocate on the ballistic missile ship? Are you thinking in terms of doing the design work and putting the design on the shelf, so that we have the means for rapid expansion of our strategic force, or do you recommend actually proceeding to deploy such a force as soon as possible?

Admiral MOORER. We are recommending again essentially the same thing; that is, to go ahead with the contract definition and to build a prototype, which would permit us to work out the manning requirements, the operational procedures, and things of that kind, and, consequently, thereby provide a means of providing a throw-weight, additional throw-weight, at relatively small cost in a relatively short time.

ROLE OF CARRIER-BASED AIRCRAFT IN STRATEGIC PLANS

Mr. KENDALL. I wonder if you could tell us, generally, what role our carrier-based aircraft play in our strategic plans and planning?

Admiral MOORER. Yes. [Deleted.]

Mr. KENDALL. To what extent, Admiral, has the strategic capability of carrier-based aviation been degraded by the utilization of our carriers in Southeast Asia?

Admiral MOORER. [Deleted.]

Mr. KENDALL. In the meantime, are they [deleted].

Admiral MOORER. [Deleted.]

Mr. KENDALL. But it means that [deleted].

Admiral MOORER. [Deleted.]

SOVIET SLBM THREAT TO U.S. TARGETS

Mr. KENDALL. The SLBM, which the Soviets have, and will have, present an enhanced threat to our bomber fleet and other soft targets because of, among other things, the short flighttime from launch to target. I assume that POLARIS constitutes a similar threat to Soviet targets, and, at least, partially for the same reason. Would this be accurate?

Admiral MOORER. That is correct.

HARD-TARGET KILL CAPABILITY OF POLARIS

Mr. KENDALL. That same short reaction time, it would appear to me, would make POLARIS more effective against a hard target such as an ICBM, if it had the warhead, the yield and the accuracy to kill it. Could you give us any appraisal of the hard target kill capability of POLARIS with its existing warhead and of POSEIDON with the MARK III warhead?

Admiral MOORER. I will ask Admiral Smith to answer that in terms of what you are talking about, which is accuracy/yield combination.

Mr. KENDALL. Yes.

Admiral MOORER. Against a certain amount of hardness.

Mr. KENDALL. Take a 300-p.s.i. target, if that is a good figure to work on.

Admiral SMITH. I don't have at my fingertips the single-shot kill probability for those various combinations. I could furnish it.

Mr. KENDALL. Would you furnish that for the record, Admiral? That would be fine.

Admiral SMITH. Yes.

(The information furnished is classified.)

POSEIDON AS A HARD TARGET KILLER

Mr. KENDALL. In the event the predicted accuracy for the MIRV-MARK III warheads for POSEIDON is not achieved; has any thinking been given to any steps that you might take which would possibly give POSEIDON a larger warhead or in some way would give it a better hard target kill capability; or do you really envision POSEIDON as a hard-target killer?

Admiral SMITH. [Deleted.]

Mr. KENDALL. I believe you said that you [deleted].

Admiral SMITH. [Deleted.]

Mr. KENDALL. From the standpoint of effective utilization of it, have you given any thought to capitalizing on the short reaction time which the Soviets would have to defend against it [deleted].

Admiral SMITH. Yes; those have been studied.

Mr. KENDALL. What is being done specifically, if anything, Admiral?

Admiral SMITH. There is no development underway at the moment.

Admiral MOORER. There was the development of the [deleted].

Admiral SMITH. Yes.

Admiral MOORER. [Deleted].

Admiral SMITH. [Deleted.]

Mr. KENDALL. [Deleted.]

Admiral SMITH. No.

Mr. KENDALL. [Deleted.]

Admiral SMITH. [Deleted.]

Admiral MOORER. [Deleted].

Admiral SMITH. Megatons.

Mr. KENDALL. As I recall it, that program has been scrubbed; hasn't it?

Admiral SMITH. That is right. However, [deleted]. These are things that could be done.

NEED FOR HARD TARGET KILLER

Mr. KENDALL. I would like to pursue one matter a little further. I know I touched on it before, Admiral. But as we have mentioned, we have the damage limiting role deemphasized in our national strategy. We are going to smaller and smaller warheads, apparently. Therefore, there must be some question in the minds of some people in the Pentagon about the need for a hard target killer.

Let me ask you again for your opinion on that; that is, whether you think we need a hard target kill capacity, and, if so, what weapons system would you recommend as being the most effective for that purpose?

Admiral MOORER. Well, I think I said before that I do think that we need to retain the capability to kill a hard target. Of course, again, there are many variables here. The aircraft could provide the best means of killing a hard target, simply because it can carry a larger warhead. But here you have the timing problem, and, consequently, for instance, [deleted].

MANNED BOMBER HAS GREATER CAPABILITY TO KILL HARD TARGET

Mr. KENDALL. What you are saying is, that, inherently, the manned bomber has a greater capability to kill a hard target, because of its bigger bang and its greater accuracy, but that it is not feasible from a strategy standpoint to use them against a time-urgent target.

Admiral MOORER. That is right.

Mr. KENDALL. For those purposes you need an ICBM.

Admiral MOORER. On targets that are time sensitive; that is right. That is my view.

Mr. KENDALL. We have information from General Wheeler that the TITAN II missile [deleted].

Admiral MOORER. That is correct; yes, sir. You have three inputs—hardness, accuracy, and yield—and these three in combination determine the probability of kill of the hard target.

CHANGES IN U.S. NUCLEAR POLICY

Mr. KENDALL. Going back to the policy question again, Admiral, during President Eisenhower's administration our nuclear policy was massive retaliation. Then in the early part of President Kennedy's administration, it swung around to counterforce or damage limiting. Now, it is back to assured destruction. Is there any real difference be-

tween the massive retaliation and the assured destruction concept; and, if not, haven't we really made a 360-degree circle and come back to what is essentially an "all cities" concept?

I am not talking about military operations, but the design and structuring of our forces from the civilian side.

Admiral MOORER. This is a matter of degree, Mr. Kendall, and I think what you say is, to a large degree, true. It is, of course, brought about primarily by the changes that have taken place in the Soviet capability; and, second, by the refinements that have been introduced in terms of hardness, and things of that kind.

WAS "ASSURED DESTRUCTION" POLICY INEVITABLE?

Mr. KENDALL. That was going to be my next question; that is, whether or not the policy that we are heading for, that is assured destruction, was inevitable in the sense that it was forced upon us by the facts of life in the nuclear age, or whether the resources we have available and could commit to our strategic weapons, if properly applied, could sustain out into the future a more flexible nuclear strategy?

Admiral MOORER. I think it is difficult to make a very clean separation between assured destruction and damage limiting. I think that these two concepts spill over into one another, and that the, of course, basic objective is deterrence. The deterrence is obtained by creating in the mind of the potential enemy the impression that he will receive unacceptable damage, no matter what preemptive action he may take against us, and I go back to my statement that it is a matter of degree, and that I believe that our plans should provide for options which would permit us to emphasize one or the other, but in any event I will go on to say it certainly takes fewer weapons, it takes fewer weapons or at least megatonnage and so on to achieve the assured destruction than it does to target every known missile launcher in Soviet Russia.

And, of course, in the case of the mobile systems, either those mobile at sea or mobile on land, the business of achieving damage limiting against those systems prove to be very difficult.

VALUE OF SUBMARINE MOBILITY

Mr. KENDALL. I would think the Soviets would be thinking about mobility in the form of land-based systems for the same reasons and with the same degree of urgency that we think of POLARIS submarines. For example, General Wheeler told us that [deleted].

Wouldn't that same reasoning apply to submarines, and particularly the POLARIS, and doesn't this justify and support the Navy's concept of the value of mobility?

Admiral MOORER. Exactly, Mr. Kendall. We have been saying that for years and years.

THREAT OF SOVIET ATTACK SUBMARINES

Mr. KENDALL. Do the new [deleted] nuclear attack submarines which the Soviets have recently shown constitute an increased threat to our POLARIS submarines, in your judgment?

Admiral MOORER. [Deleted.]

Mr. KENDALL. Has this required us to take any counteractions that we weren't already taking, or are we doing essentially the same thing? I am talking about the [deleted] submarine.

Admiral MOORER. No, sir. [Deleted.]

Mr. KENDALL. That is all I have, Mr. Chairman.

Thank you very much, Admiral. It is always a pleasure to have you with us.

Admiral MOORER. Thank you.

FURTHER DISCUSSION OF BMS

Senator STENNIS. Admiral, I was impressed with your discussion of the proposed sea-based antiballistic missile system. As I understand you, that system would not utilize submarines.

Admiral MOORER. No, sir. This would be a surface ship, Mr. Chairman, but we propose to use the POSEIDON missile, and marry it to the technology developed in the NIKE-X system, and base it aboard a surface ship.

Senator STENNIS. POSEIDON. How would you protect that ship? What would be the components of a unit to protect it?

Admiral MOORER. Well, sir, we would protect it in several ways. First, by providing other ships with it as one means.

Second, by changing its location [deleted], things of that kind, and I would point out that the time element that we are really dealing with here, in a nuclear exchange, is very short.

For instance, any efforts or move on the part of the enemy to attack this ship would be, of course, a giveaway that they were just in the process or planning to initiate a nuclear attack on the United States, and I think that we can operate these ships in such a way that it would be most difficult to time their destruction with the firing of the missiles. But so far as their protection is concerned, we would provide other naval forces.

Senator STENNIS. What other naval forces would that take? What would it require?

Admiral MOORER. It would require ASW ships and ASW aircraft. We could, of course, bring in [deleted].

Senator STENNIS. To get this protection by air, would that require a carrier?

Admiral MOORER. We could protect it with patrol planes, sir, from Alaska, or some place in the vicinity, from the United States.

COST OF SABMIS

Senator STENNIS. It impresses me that we would assume a terrific additional financial burden by deploying a new floating antimissile missile system. We are going to have to draw the line somewhere on the number of different systems we can deploy. The POLARIS was justified partly on the ground that it was invulnerable because of its mobility and use of the ocean. Do you really feel that there is an urgent need for this additional antiballistic missile system?

Admiral MOORER. Well, sir, I believe that it is always prudent to develop defense in depth.

Senator STENNIS. Yes.

Admiral MOORER. And this system has as its main advantage the capability to destroy the enemy missiles [deleted] and as we mentioned before, then it takes fewer missiles to destroy the enemy missile in the early part of its trajectory than it does after it has arrived in the United States [deleted]. But we consider this as a backup to the NIKE-X, and a contribution which will provide defense in depth, rather than just defense at the end of the trajectory.

Senator STENNIS. All right.

What I say doesn't detract any from your POLARIS or your POSEIDON.

All right, Senator Thurmond?

DIFFERENCE BETWEEN ULMS AND POLARIS

Senator THURMOND. I just have a few questions.

Admiral, let's go back a minute to this ULMS.

Admiral MOORER. Yes, sir.

Senator THURMOND. Undersea long range ballistic system.

What would be the main difference in that and the POLARIS submarine?

Admiral MOORER. The main difference, sir, the current concept which I believe we showed on the slide—did you see the slide, Senator?

Could you put that back up again?

The idea would be to carry the missiles [deleted].

But, in short, it is simply a development of the POLARIS/POSEIDON idea with new techniques, and so on. The principles are the same. The concept of operation is essentially the same. It is just an advanced POLARIS submarine, if you want to look at it that way.

Senator THURMOND. Well, it is very similar, then, in its operation to the POLARIS in a way; isn't it, [deleted].

Admiral MOORER. That is true, sir. We would expect to have the missiles with longer range, and, therefore, permit us to have larger missiles, than we could by having the longer range, could operate in a much broader expanse of the ocean. I will ask Admiral Smith to expand on what I have said.

Admiral SMITH. I think that is the key difference. That the range of the missile is long enough to be able to hide in and use a great deal more of the ocean [deleted].

Senator THURMOND. These systems cost a lot of money, and I am willing to do anything to keep this country superior to the Soviets—because there is no question in my mind that they want to take over this country and the rest of the world—and we have got to do that. But, I am wondering about the advantage of this over the POLARIS system, and their comparative costs; and whether or not there is a sufficient improvement to warrant the millions of dollars it will take to do it.

Admiral MOORER. I think on two counts—

ULMS WOULD HAVE LARGER MISSILE

Senator THURMOND. As I understand it, the main thing here, you get a bigger missile; is that it?

Admiral MOORER. You get a missile; yes, sir. A bigger missile in the sense that it has certainly longer range [deleted].

Senator THURMOND. You can't get that [deleted]?

Admiral SMITH. No.

Senator THURMOND. You can't get that [deleted]?

Admiral SMITH. No. [Deleted.]

Senator THURMOND. What is that?

Admiral SMITH. [Deleted.]

DEVELOPMENT OF ULMS CONCEPT

Senator THURMOND. When did you come up with this idea? Who came up with this idea?

Admiral MOORER. That came out of the STRAT-X study that I mentioned earlier, sir, which was made for the Secretary of Defense, and considered not only sea-based systems but land-based systems as well.

Senator THURMOND. You haven't actually tested this system to see if it will work, have you?

Admiral SMITH. No.

Admiral MOORER. I think, during the POLARIS development, we did something like this, but we have [deleted] million in the 1969 budget, to go ahead with this idea, and I think that it should be looked at not only with respect to the POLARIS but also with respect to all other systems, both land-based and sea-based, that we would consider for deployment in the future.

Senator THURMOND. Has any nation or anybody—I don't presume that if we or the Soviets don't have it that any other nation has it, but why haven't we thought of this before, [deleted].

Admiral SMITH. It has been thought of before. In the original POLARIS development, one of the key items that discouraged going in this direction was an [deleted]. We had to make a choice at the time that we built those submarines.

As a result of the experience that we have had, we now can see that that [deleted].

Senator THURMOND. In other words, you have found that there is very little [deleted].

Admiral SMITH. That is right.

Senator THURMOND. Now, this missile, as I understand it, [deleted].

Admiral SMITH. The basic element is that it has its [deleted].

Senator THURMOND. It would be [deleted] though?

Admiral SMITH. It would be [deleted].

Senator THURMOND. Until it is decided to fire it?

Admiral SMITH. Yes.

Senator THURMOND. Would the whole [deleted]. That is what you say hasn't been decided?

Admiral SMITH. It can be done either way and there are pros and cons.

NO TESTS YET RUN

Senator THURMOND. Have you run tests on that way?

Admiral SMITH. There are pros and cons from an engineering point of view on that.

Senator THURMOND. You have run no tests as yet to determine that?

Admiral SMITH. No tests; no. Design studies.

Senator THURMOND. When do you plan to conduct tests to see if this is going to work? As I understand it, this is in the theory stage.

Admiral SMITH. As far as these [deleted] are concerned, we have already done that before. It works.

Senator THURMOND. What did you fire it from?

Admiral SMITH. Actually, this was a [deleted]. This was done early in the POLARIS program.

Senator THURMOND. And you could control it and guide it?

Admiral SMITH. Yes.

Senator THURMOND. Satisfactorily?

Admiral SMITH. Yes.

Senator THURMOND. In other words, that was similar to a situation like the POLARIS, as if it had [deleted].

Admiral SMITH. As far as controlling it and guiding it, there is no difference really, between this and [deleted] just like it was flying.

Senator THURMOND. There is no element in the [deleted].

Admiral SMITH. It is in a [deleted].

Senator THURMOND. [Deleted.]

Admiral SMITH. [Deleted.]

Senator THURMOND. [Deleted.]

Admiral SMITH. Yes, [deleted].

NAVY IS LOOKING FOR GREATER RANGE AND PAYLOAD

Senator THURMOND. You do have reason to believe that this would work, that it would be practical, and would give us a larger payload; is that the point?

Admiral SMITH. This is a means of—

Senator THURMOND. What you are looking for is a bigger payload, as I understand it.

Admiral SMITH. And bigger range, greater range.

Senator THURMOND. When I said payload I meant both range and—

Admiral SMITH. Yes.

Senator THURMOND. But technically speaking, payload would be just the weapon fired, wouldn't it?

COST OF ULMS

Admiral SMITH. As to the cost of the system, we have conceptually devised ways of decreasing the submarine effective cost by decreasing the overhaul costs and by decreasing the amount of time for overhaul, so that it is on [deleted].

Senator THURMOND. One thing, you wouldn't have to have a lot of [deleted] for this that you do for the POLARIS, for instance?

Admiral SMITH. Just about the same.

Senator THURMOND. Oh, you would have to have about the same amount of [deleted].

Admiral SMITH. Yes.

Senator THURMOND. I was thinking the [deleted].

Admiral SMITH. That is a very little amount.

No, that is true, you wouldn't need that.

Senator THURMOND. And then the [deleted], because now you have—is it 12 to the submarine?

Admiral SMITH. Sixteen.

Admiral MOORER. Sixteen.

Senator THURMOND. Sixteen to each POLARIS submarine.

Admiral MOORER. Yes.

Senator THURMOND. [Deleted.]

Admiral SMITH. Yes.

Senator THURMOND. Now, you wouldn't have to have that [deleted]; would you?

Admiral SMITH. No.

Senator THURMOND. Would the submarine then be [deleted] as the POLARIS is now?

Admiral SMITH. These preliminary designs are actually [deleted].

Senator THURMOND. They are [deleted].

Admiral SMITH. But the amount [deleted].

Senator THURMOND. Is that for the purpose of taking them around?

Admiral SMITH. [Deleted.]

THURMOND SUPPORTS SEA-BASED WEAPONS

Senator THURMOND. I am strongly in favor of having weapons at sea, because I feel that they can strike our fixed installations such as silos. They know where these are. All they have to do is to target them. However, if we have a moving submarine or a moving ship, to me it just makes a lot more sense; certainly the mobility gives a lot more protection. Is that your thinking?

Admiral SMITH. Yes, sir.

FURTHER DISCUSSION OF SABMIS

Senator THURMOND. Now, the other question I had is on this SABMIS, the sea-based ballistic missile intercept system. That is an ABM system, isn't it?

Admiral SMITH. Yes, sir.

Senator THURMOND. That is an antiballistic missile system?

Admiral SMITH. Yes.

Senator THURMOND. For years, of course, since 1957 and before, the Army has been working on the antiballistic missile system. You are familiar, of course, with the NIKE-X, with the SPARTAN missile, and the SPRINT missile. That is a very complex system, with its radar and associated equipment, and it takes tremendous installations and so forth.

I just wondered if you had refined an ABM system so that it could be placed on a ship at a reasonable cost—more reasonable than the ABM system the Army is working on.

Admiral SMITH. As far as being able to get the equipment on the ship, yes. This has been tied down. The cost comes more in terms

of the kind of cost effectiveness that Admiral Moorer was talking about, the [deleted].

NAVY HAS HAD THE BENEFIT OF ARMY ABM TECHNOLOGY

Senator THURMOND. Have you used the scientific knowledge and the technological information that has been gained by the Army through at least 13 years of experience? Have you gotten the benefit of that?

Admiral SMITH. Yes, sir.

Senator THURMOND. So you wouldn't have to go through and make all the tests again and do the research that they have already done, that should be available to you?

Admiral SMITH. Yes, sir.

LEADTIME FOR SABMIS DEPLOYMENT

Senator THURMOND. How soon would it take you to build a ship and actually deploy an ABM system on it, once you started?

Admiral SMITH. Admiral Moorer testified that this could be done by [deleted].

Senator THURMOND. By [deleted].

Admiral SMITH. Yes, sir.

COST OF SABMIS

Senator THURMOND. And what was the estimated cost?

Admiral MOORER. This is just an estimate, of course, but at this stage our estimate is that the total procurement plus the [deleted] year operating costs for [deleted] ships is [deleted] billion.

Senator THURMOND. [Deleted] billion?

Admiral MOORER. For [deleted] years.

SABMIS IS NOT A REPLACEMENT FOR ARMY SYSTEM

Senator THURMOND. That is a lot cheaper than the Army's system.

Now, just what protection would this give us, compared with what the Army system is supposed to furnish?

Admiral MOORER. We look on this, sir, as I mentioned before, as not a replacement for the Army system, but a—

Senator THURMOND. Supplementary to it?

Admiral MOORER. A complement in that it gives us defense in depth, and we would hope to get as many missiles as possible, and then the ones that are deployed over the United States, of course, would be taken on by the NIKE, but this would make the NIKE problem much simpler.

Senator THURMOND. In other words, you would try to get those missiles before they got over here?

Admiral MOORER. Yes, sir; and before they had an opportunity—

Senator THURMOND. And before they are [deleted].

Admiral MOORER. That is right. That is the idea, [deleted].

Senator THURMOND. Can this missile go up fast enough to do that?

Admiral MOORER. Yes, sir. It would be an intercept problem, as indicated on the slide.

NECESSITY FOR ABM SYSTEM

Senator THURMOND. I am convinced that we have got to have an ABM system, and I am very glad you are working on it. From what you say about it, it seems it might be a very fine supplement to the system that the Army has been working on.

Of course, that means more money. We speak of \$20 billion to \$40 billion for the system the Army is talking about. This would cost [deleted] billion more. The SENTINEL system, it has been suggested, we go forward with now, which is a thin system, was about [deleted] billion, wasn't it, Senator?

Senator STENNIS. Yes, something like that.

Senator THURMOND. About [deleted] billion. The complete system would give us protection against the Soviets and, in my judgment, that is who we had better have a defense against, because it will be some time before Red China will constitute the threat that the Soviets pose today. I think this a matter we must go forward with.

I wanted to find out how far you are going. How long have you been working on this ABM system in the Navy?

Admiral MOORER. Since 1965, I think. We have been studying it. We haven't spent very much money on it. As a matter of fact, we spent \$1 million, almost \$1 million in 1968, and have another [deleted] million in 1969.

NAVY FEELS SABMIS IS PRACTICAL

Senator THURMOND. You have done enough research on it to convince you that this is practical and will produce the results which you desire?

Admiral MOORER. We feel so, Senator Thurmond. We would like to go ahead and push it through contract definition, so we can be certain that this is in fact the case.

Senator THURMOND. Thank you very much.

Admiral MOORER. Yes, sir.

Senator THURMOND. Thank you, Mr. Chairman.

Senator STENNIS. Yes, sir. Thank you, Senator.

Admiral, do you have something else you wish to say?

Admiral MOORER. I would just close with one statement, Senator, and that is that I was, in the preparation of my statement, simply endeavoring to point out the advantage of dispersing our systems worldwide, in order to complicate the problems of the other side.

DEFENSE DEMANDS FOR FUNDS

Senator STENNIS. Oh, yes. That is a good point. We want you to stress that. We think you know what you are talking about. You have done a good job in developing that missile and all. I don't know about that [deleted] billion. We have got to have some left for other purposes.

Admiral MOORER. That was a [deleted] year cost, sir.

Senator STENNIS. Including the salaries of personnel?

Admiral MOORER. Yes, sir.

Senator STENNIS. There are so many demands for so many billions. I am not foreclosing this in my thinking. I just point out that that is

one of the choices that has to be made, and that might be one that will be chosen.

Admiral MOORER. Yes, sir.

Senator STENNIS. Do you gentlemen who are accompanying the Admiral have something you wish to add?

Admiral MOORER. No, thank you.

Senator THURMOND. Mr. Chairman, just one other thing.

Senator STENNIS. All right, Senator.

Senator THURMOND. The [deleted] billion you mentioned, that covers the complete system? Does that cover ships with it?

Admiral MOORER. Yes, sir, [deleted] ships and [deleted] year operating cost.

Senator THURMOND. The cost of [deleted] ships?

Admiral MOORER. [Deleted] year operating costs.

Senator THURMOND. And [deleted] year operating costs with the complete weapons system on each of the [deleted] ships?

Admiral MOORER. Yes, sir.

Senator THURMOND. Thank you, Mr. Chairman.

Senator STENNIS. Yes, sir; thank you.

All right, gentlemen. Thank you very much.

RECESS

The committee will take a recess until the call of the Chair.

(Whereupon, at 12:20 p.m., the subcommittee recessed, to reconvene subject to call of the Chair.)

STATUS OF U.S. STRATEGIC POWER

FRIDAY, MAY 10, 1968

U.S. SENATE,
PREPAREDNESS INVESTIGATING SUBCOMMITTEE OF THE
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee (composed of Senators Stennis (chairman), Symington, Jackson, Cannon, Byrd of West Virginia, Smith, Thurmond, and Miller) met pursuant to call, at 10:05 o'clock a.m., in room 224, Old Senate Office Building, Senator Henry M. Jackson presiding.

Present: Senators Jackson (presiding), and Symington.

Also present: James T. Kendall, chief counsel, and Everette L. Harper, of the subcommittee staff.

Senator JACKSON. The committee will come to order.

CHAIRMAN'S OPENING STATEMENT

As our hearings on U.S. strategic weapons and weapon delivery systems have progressed, we have heretofore concentrated primarily on strategic offensive systems for the reason that it is there that our national effort has thus far placed the greater emphasis. We have always recognized, however, that defensive weapon systems also play an important part in our national strategy.

The offensive role in the structuring of our nuclear strategic forces is assigned to the Air Force, with its ICBM's and manned bombers, and to the Navy with its submarine-launched ballistic missile systems. We have heard extensive testimony from the Air Force and Navy on these systems.

We come now to the consideration of our defensive strategic weapon systems, and that job has been given to the Army. A substantial R. & D. effort has been underway for several years seeking to develop a defensive system which would provide protection from missile attacks against the United States. The decision has been made only to deploy SENTINEL, a limited antiballistic missile system, although the Joint Chiefs have repeatedly recommended that a much more extensive system be deployed.

To discuss the Army's contribution to our strategic posture as well as to share with us his views on the total strategic warfare problem, we are privileged to have with us today Gen. Harold K. Johnson, Chief of Staff of the Army. He is accompanied by Lt. Gen. A. W. Betts, Chief of Research and Development, and by Brig. Gen. George Mayo, Jr., Deputy for Plans, SENTINEL Systems Office.

It is a particular pleasure to have General Johnson with us today. Regrettably this may be the subcommittee's last opportunity to receive the benefit of his wise counsel in his official capacity as Chief of Staff. He will retire, effective July 1, after a long and distinguished military career. He has served our country well. He has also served this subcommittee well, and his enlightening testimony and sound advice has been invaluable over the past 4 years as we have considered such difficult problems as the war in Southeast Asia, U.S. worldwide commitments, Army readiness, the Army Reserve-National Guard merger proposal, and many others.

Both the country and the Congress will miss General Johnson. Meanwhile, we consider ourselves fortunate to have this opportunity to get his views on our overall strategic nuclear posture and on the national strategy for providing for the country's security from nuclear attacks.

General, we are delighted to have you with us. I suppose when you retire, you will be wanting to go back to your native State of North Dakota, I believe it is.

General JOHNSON. That is my native State. Whether or not I go back is debatable.

Senator JACKSON. We are delighted to have you, General.

STATEMENT OF GEN. HAROLD K. JOHNSON, CHIEF OF STAFF, U.S. ARMY; ACCOMPANIED BY LT. GEN. AUSTIN W. BETTS, CHIEF OF RESEARCH AND DEVELOPMENT; BRIG. GEN. GEORGE MAYO, JR., DEPUTY SENTINEL SYSTEMS MANAGER (PLANS), SENTINEL SYSTEMS OFFICE; AND COL. DONALD K. STEVENS, OFFICE, DEPUTY CHIEF OF STAFF FOR MILITARY OPERATIONS, U.S. ARMY

General JOHNSON. Thank you, sir, and I am grateful for your comment.

Mr. Chairman, it is an honor to appear before this subcommittee and to have the opportunity to present my views on the important matter you are considering.

In his statement before this subcommittee General Wheeler emphasized that:

The most dangerous threat to the United States is posed by the growing Soviet strategic nuclear force.

I share this view. Let me begin by quoting from my 1968 posture statement in support of the fiscal year 1969 President's budget:

THREAT

The most dangerous military threat to the continuing security of this Nation is that derived from the intercontinental mass destruction delivery capability of the Soviet Union * * *. It is the single element of their military power which threatens us with devastating physical destruction here at home. Its potential consequences require, therefore, that it continue to receive preeminent priority in the conceptual context of our national military strategy and in the development of force levels needed to give effect to that strategy.

We believe that the Soviets are continuing to improve their long-range nuclear delivery capabilities and that they are actively improving their damage limiting posture. The complementary nature of these actions could result in increasing the level of Soviet confidence in their own retaliatory posture. In addition, we

face Communist China's developing nuclear capability which now threatens peripheral Asia.

The principal objective of U.S. military strategy is the deterrence of aggression at any level. Should deterrence fail, the principal objective of our military strategy then becomes the termination of hostilities under conditions of relative advantage, while limiting damage to the United States and minimizing damage to U.S. and allied interests. I would stress that our first objective, then, is deterrence. Deterrence is a state of mind, and it is conditioned by perceptions as well as actualities of force effectiveness and judgment as to the willingness to employ those forces. Actual capabilities and resolve are essential to the credibility of deterrence—to our adversaries, to our allies, and to the Commander in Chief in any crisis. Since deterrence rests in part on the actual relative force posture, let us examine briefly the status of these forces.

FORCE PROJECTIONS

First, let us consider Soviet programs, for we believe they are making a significant advance in both offensive and defensive forces.

OFFENSIVE FORCES

There are various qualitative and quantitative measures of strategic offensive forces which reflect to some degree the potential capabilities of these forces. As a minimum we should consider the numbers of launchers, the number of nuclear weapons programed, and the throw-weight or payload. We estimate that the Soviet Union now has about [deleted] ICBM's and submarine-launched missiles capable of attacking the United States and that it is moving to improve its assured destruction capability, and perhaps its damage, limiting capability, by a [deleted] increase in numbers of missiles, by hardening and dispersing its fixed launch sites, and by increasing the number of its mobile launch vehicles. The U.S. advantage in numbers of weapons is projected to continue, [deleted]. Of course, the United States also has a substantial bomber force which enters into any relative strategic appraisal. In the same light, Soviet bombers and cruise missiles are an important part of the total threat to the continental United States.

DEFENSIVE FORCES

The interlocking aspects of defense and offense are well illustrated by the consideration we must give to Soviet defensive systems. In addition to their offensive force, the U.S.S.R. is deploying a ballistic missile defense (BMD), with sites now becoming operational around Moscow. Beyond the Moscow missile defense there is the TALLINN system which [deleted] was designed and deployed as a surface-to-air missile (SAM) system, [deleted].

U.S. BALLISTIC MISSILE DEFENSE

The United States also has begun work on deploying a ballistic missile defense system, but it is oriented to meet a Chinese Communist attack. The SENTINEL system deployment is a response to the

CHICOM nuclear weapon and missile programs that have been developed at a pace beyond that originally estimated by the United States. On the basis of known CHICOM progress, it is entirely possible that their ICBM will follow on behind their short-range missiles within the next several years.

The decision to deploy the SENTINEL system is a useful first step toward ballistic missile defense for the United States. This will integrate some of the components developed under the NIKE-X program into our defensive posture. We are initiating production of these components and will derive practical experience in deploying and operating this highly sophisticated system in the field. We will benefit from defining the computer programs—software if you like—that are essential to active defense against ballistic missiles.

Based on development progress to date and current plans, the first SENTINEL battery will be operational in calendar year [deleted] with the entire SENTINEL system operational by [deleted]. General Mayo, the Deputy SENTINEL Systems Manager, is with me and is available to explain the characteristics of the system in more detail, if you so desire.

DETERRENCE

I would stress again that deterrence is not so much what we believe as what the other person believes. The Joint Chiefs of Staff recognize that there are risks and uncertainties in selecting various levels of military force. They recognize, and I support, the requirement for both strategic offensive and strategic defensive forces as necessary to both deterrence of general nuclear war and as a means of insuring the survival of the United States as a national entity, should deterrence fail. The Soviets have elected to increase their intercontinental ballistic missile force and their sea-launched ballistic missile force. They have elected to field a ballistic missile defense and to improve their air defenses.

I am pleased that the Army, in addition to participating in an important way in the air defense of the United States, is taking a significant first step toward ballistic missile defense of the United States by deploying the SENTINEL system. At the same time, we are continuing the NIKE-X advanced development program to develop improved means for damage limiting and options for defense of our strategic offensive systems. I believe all these measures properly pursued will reduce the probability of nuclear attack upon the United States and contribute to deterrence, while helping to assure that if a nuclear war occurs, the United States and its allies will emerge under conditions of relative advantage in all instances.

Sir, that completes my statement.

SENATOR JACKSON'S VIEWS ON DETERRENCE

Senator JACKSON. General, first of all, I want to compliment you on your definition of deterrence. I think we have a tendency to give a limited definition of deterrence as being sort of a combination of forces in being, plus a state of mind, plus will, but it goes beyond that, as you pointed out. Deterrence must be credible to our allies, and to put it

another way, it must also be reassuring to an American President, especially in a given crisis. If he is not sure of the effectiveness of our deterrence, then he might make concessions when he should not make them or need not make them. I think those three areas are so vital that they are often overlooked.

I also agree completely with your observation that deterrence is not so much what we believe as to what the other person believes. I think this point goes to the heart of the whole question of an ABM.

WHETHER SOVIETS BELIEVE ABM WILL WORK IS FUNDAMENTAL QUESTION

I personally have reservations as to the effectiveness of an anti-ballistic missile system. I think in this age of science, science is rather partial to the offense and not as partial to the defense.

I believe that we can penetrate their defense, and I think that they can penetrate ours. That is not the question. I think the real question is, what is it that they believe. I have had this argument with scientists and others who disagree on the ABM, but I think we know that the Russians historically lay heavy emphasis, do they not, on defense. This has been true since the first Kremlin Wall was built to keep the hordes, the Mongols, out.

I must say that when people say there is no need for an ABM, that we can penetrate it, I think one has to really ask that fundamental question; I have never been able to get a firm answer: Do the Russians really believe that their ABM system will work? If they believe it, even though we don't believe it, then deterrence may have failed, because we could have nuclear war.

Do you agree with that?

General JOHNSON. I subscribe to that entirely, because I think that it is very clear that the Soviets believe it. Otherwise they would not be deploying what is accepted by all of the intelligence community as an ABM system around Moscow, nor would they be [deleted] although there is some dispute as to whether it is a defense against [deleted].

It certainly makes no sense for them to deploy such systems, if they didn't believe that they had some utility in the defense of their country.

Senator JACKSON. I can't quite see them investing too much of their resources in an ABM system, if it is ineffective. There are those who say that the generals have a lot of influence over there, Army generals, that is, in the Soviet Union, and that maybe the civilians, political leaders on top, simply have to give in to them. That they really do not believe that it is effective. That is another argument, as you know.

I can't, for myself, see why they would be putting so much into an ABM system, if it was not effective.

RUSSIANS TRADITIONALLY DEFENSE MINDED

General JOHNSON. It is difficult to see, and, as you indicated earlier, Imperial Russia, and now the Soviet Union, have always had a very deep complex about effective defense. The Russians have traditionally placed a substantial portion of their total effort in defense measures,

so that this is not at all inconsistent with the basic philosophy that they appear to have followed for many, many years.

Senator JACKSON. Let me ask you, could [deleted].

General JOHNSON. [Deleted.]

But I would like to defer to General Betts.

Senator JACKSON. General Betts.

General BETTS. The answer to your question depends on the use of the words "readily" or "easily." [Deleted.]

As you are aware, we have decided we have to defend our [deleted]. That is the kind of—

Senator JACKSON. You have SPARTAN and SPRINT at all [deleted].

General BETTS. [Deleted.]

Senator JACKSON. But the [deleted] that could be used to—

General BETTS. It can do [deleted].

Senator JACKSON. That is the kind that they appear to have deployed?

General BETTS. [Deleted.]

Senator JACKSON. Yes.

General BETTS. That is associated with the TALLINN system itself.

Senator JACKSON. The [deleted]. Would that be more comparable to the [deleted]?

General BETTS. That would be roughly comparable to the [deleted].

Senator JACKSON. Right.

General BETTS. It is not quite the same technical approach, but it is roughly comparable.

Senator JACKSON. How far have they gone toward something like the [deleted].

General BETTS. [Deleted.]

Senator JACKSON. [Deleted.]

General BETTS. [Deleted.]

Senator JACKSON. Right, as far as a ballistic missile system is concerned.

General BETTS. That is correct. If [deleted].

Senator JACKSON. Right.

General BETTS. It takes time to build that sort of capability.

Senator JACKSON. [Deleted.] They have got a little over 100 of the long-range bombers, as I recollect, 200, is it, all told? That is various types of bombers?

General BETTS. [Deleted.]

General JOHNSON. Basically it covers three things. Their population belt runs Leningrad, Moscow, and east to the Urals, and south. [Deleted.]

Senator JACKSON. That is rather surprising. [Deleted.]

General JOHNSON. Of course, a part of this is [deleted] an exchange had taken place, if this were possible.

Senator JACKSON. [Deleted.] Really?

General JOHNSON. Yes, sir.

Senator JACKSON. I would think they would have enough [deleted]. as I recollect it.

DEFENSE PHILOSOPHY

General JOHNSON. I think that this is one of the difficulties—is attempting to assess what they would do in the light of similar circumstances. I just don't think they think like we think, to begin with.

The second thing is that there has been some tendency to not think far enough into the future. The completion of a nuclear exchange, in my judgment, does not then end the world. Somebody is going to have to pick up and reconstruct what remains, and I think perhaps they may be thinking in some of these terms about what will happen during the follow-on period.

Senator JACKSON. Yes. My only response to that would be that I would assume that they would not anticipate a further nuclear exchange after the adversary had been obliterated. That the damage-limiting aspects of their effort would be a very important one; that is, to try to save as much of their human resources first, and then their supporting productive resources that would relate to the surviving population. [Deleted.]

Well, let me ask, Why do you feel that they have not apparently [deleted]?

General JOHNSON. My recollection is it was a little bit later than that, about 1961 or thereabouts, and then in about 1962 there was a suspension of that deployment, and it was in 1962, you will recall [deleted].

Senator JACKSON. [Deleted], I think, or in that area.

General JOHNSON. [Deleted.]

Senator JACKSON. Of course, it differs in configuration and in other respects from the kind of defensive system deployed around Moscow; does it not?

General JOHNSON. That is correct. It is a different type of system than the Moscow system.

Senator JACKSON. Yes. And this raises the question: Is the system being deployed around Moscow more recent than the TALLINN system, or is it a continuation of the older system that started to be deployed some time ago?

General JOHNSON. [Deleted.] But I would like to turn to both General Betts and to General Mayo in this regard, to ask them to put their views in the record, if you wish.

Senator JACKSON. Yes.

General Betts, do you want to respond first and then General Mayo?

General BETTS. General Johnson is correct. [Deleted.] That doesn't mean that it is ineffective, by any means. [Deleted.]

Senator JACKSON. General Mayo.

General MAYO. I believe the answers that General Johnson and General Betts have supplied cover the subject quite thoroughly. We believe we are developing a [deleted] beyond the NIKE/ZEUS state of the art that we had at the time the Soviets were commencing their first deployment efforts.

Senator JACKSON. The thing that does bother me is that [deleted].

General JOHNSON. I don't recall what Mr. McNamara's posture statement says on that subject. One could speculate [deleted].

But as I indicated earlier [deleted].

Senator JACKSON. [Deleted.]

General JOHNSON. Well, [deleted].

Senator JACKSON. Have they been deploying the TALLINN system or are they continuing to deploy it? What does our intelligence indicate in that regard?

General JOHNSON. I don't have the latest figures.

Senator JACKSON. When was the last construction that we have been able to pick up, on the TALLINN sites?

General JOHNSON. Do you have that?

General BETTS. I am not right up to date on it.

General JOHNSON. I can provide that for the record.

(The information furnished was classified.)

Senator JACKSON. Has it been fairly recent?

General JOHNSON. [Deleted.]

General BETTS. [Deleted.]

Senator JACKSON. [Deleted.]

General BETTS. [Deleted.]

Senator JACKSON. [Deleted.]

General BETTS. That is right.

General JOHNSON. There has been evidence [deleted] in this regard.

Senator JACKSON. I would think that if it is the slightest means of strategic air defense against manned bombers or ballistic missiles, that they would have moved this system in around Moscow.

General BETTS. Well, if it were to be an air defense system, anything attacking Moscow would have to run the gauntlet.

Senator JACKSON. That is true, but I am thinking, you know, as a point defense against missiles, if it is their latest system. What I am trying to find out is whether the ABM system around Moscow is the latest version of some kind of a defense system, or whether it is of older vintage, and the TALLINN system is a newer system, whatever it defends against.

General JOHNSON. I think the answer to the question is [deleted].

FOLLOW-ON CAPABILITY OF SENTINEL

Senator JACKSON. Yes. Now, I might ask a question or two about the SENTINEL system. Are we making any headway in improving this system, looking a head a few years, so that we could prudently deploy it against the Soviet threat?

General JOHNSON. Let me respond first, and then defer to both General Betts and General Mayo.

When one deploys a system, it is necessary to freeze to a degree the design so that you can go ahead with your production. While we expect in the deployment of the SENTINEL system to take advantage of advances, we may not be able to take advantage of all of them, particularly those in which there might be a relatively high degree of uncertainty. Therefore, we have separated very sharply and clearly the deployment of SENTINEL, which has been turned over to General Starbird as the SENTINEL system manager, and advance research and work on continuing improvement of what we call the NIKE-X advanced development program which remains in the hands of our Chief of Research and Development. Thus two separate organizations are pursuing these two separate courses.

Now, I would defer to General Betts to talk about the research for the future, and defer to General Mayo to talk about just what advances might be incorporated during the progress of deployment of SENTINEL.

Senator JACKSON. General Betts, you look way out into the future. I hope it won't be too far.

General BETTS. We have divided this effort into those subsystem improvements that will certainly be included in the SENTINEL system and those are, logically, the SENTINEL system manager's effort. The second category then would be those that look attractive, but we haven't yet done enough work, or we are not yet sufficiently certain of the threat possibilities, that we are ready to make a decision as to what the plan would be to incorporate them in the system.

For example, we are still doing work on a large multifunction array radar, for two reasons: One, at Kwajalein, it is the only way we can get the kind of capability we need to evaluate our own offensive systems. Second, is that, if we want a very much increased urban defense that in fact can handle multiple targets with a major discrimination capability, then we need something more capable than the missile site radar now in the SENTINEL system.

In addition to that, we recognize that there are improvements one can make to the [deleted] that will give it a great deal more capability to respond to the changing threat. Broadly speaking, we call this the [deleted].

Those are the rather big things that would make major increases in the effectiveness of the SENTINEL system, and would, in some measure, obviate the necessity to get increased capability by proliferating sites.

In addition to these major steps, we have improvements in missile technology, improvements in radar technology, and all of the sensor studies looking further out into the future that might contribute to the total effectiveness of the system.

Senator JACKSON. Is any consideration being given to the possible deployment of missiles that can [deleted]?

General BETTS. The basic SPARTAN warhead will have a [deleted].

Senator JACKSON. Yes.

General BETTS. That is one of its kill mechanisms.

Senator JACKSON. But the yield is about, what [deleted]?

General BETTS. No, sir. It is going to be more likely in the neighborhood of [deleted].

Senator JACKSON. [Deleted.]

General BETTS. Yes, sir; but that is a lot of [deleted].

Senator JACKSON. What is your plan of defense against FOBS?

General BETTS. [Deleted.]

Senator JACKSON. Right.

General BETTS. So the [deleted] contributes to that defense considerably.

Senator JACKSON. Are you satisfied with the progress we are making on over-the-horizon radar?

General BETTS. Over-the-horizon radar will certainly make a contribution to our early warning capability and give us some tracking information. [Deleted] and its inputs have to be part of the total system.

Senator JACKSON. But we have some time to go before we have a [deleted].

General BETTS. That is true.

Senator JACKSON. I understand our current operational capability is [deleted] at the present time.

General JOHNSON. [Deleted.]

Senator JACKSON. Right.

General JOHNSON. But holds more than promise, because it is really here.

General BETTS. [Deleted.]

Senator JACKSON. Yes.

General BETTS. But its inputs will certainly help in something like an FOBS.

Senator JACKSON. General Mayo?

EXPANSION CAPABILITY BUILT INTO SENTINEL SYSTEM

General MAYO. Referring particularly to our capability to add improvements to Sentinel, they are largely in the area of qualitative improvements that we anticipate, and as General Betts mentioned, we have development underway on projects which we consider could reasonably be easily added to the system.

I refer here to such items as [deleted].

In addition, we have built into the system the capability of expanding its capacity.

For instance, the MSR's, which are now constructed with two, three, or four faces, depending upon their relative location, each MSR can be expanded to a full four-face capacity.

The PARS, the long-range acquisition radar, now oriented generally to the north facing the Chinese Communist threat, can be augmented by adding one or two faces to give a full hemispheric coverage.

The choice of sites was made, of course, with the basic purpose of fulfilling the mission of providing overall coverage of the United States. Nevertheless, we have sought, in finding our locations, to provide for the opportunity to expand incrementally the deployment, at the same time preserving an overall balance in the course of this expansion.

The operating portion of the SENTINEL System Managers Organization is concentrated in the SENTINEL System Command at Huntsville, Ala. Colocated with that organization is the NIKE-X Development Office under the Advance Ballistic Missile Defense Agency, which works under General Betts, so that the two organizations are working side by side, and we seek, through this means, to find the best cooperation and coordination between the two, so that we can insure that what we are doing will, as far as possible, accommodate follow-on improvements under General Betts' control.

I think that about sums it up.

Senator JACKSON. Obviously, that is very important, because if this system is to be effective, there has to be certain building block capability, not to say that you just add on to existing systems, but it has to be planned, obviously, in such a fashion. I would think, that you are taking into consideration what R. & D. may be coming up with, several years hence.

This, I gather, you are doing in connection with the coordination with R. & D. in the Army.

General MAYO. That is correct.

Senator JACKSON. Has there been a decision about MINUTEMAN defense with SPRINT?

General JOHNSON. There has not been. Our instructions are to keep the option open, but it is necessary to consider three things.

[Deleted] which is the best method and which is the most cost effective method.

Senator JACKSON. Mr. Kendall.

DEFENSE AGAINST SLBM

Mr. KENDALL. Thank you, Mr. Chairman.

To follow up with a question on the matter you have been discussing, let me ask if SENTINEL has any capability against a submarine-launched ballistic missile?

General MAYO. [Deleted.]

Mr. KENDALL. Does it have any potential for the capability to be added to it in the future?

General MAYO. Yes.

General JOHNSON. I think we should expand that answer. [Deleted.]

A specific example, we plan a [deleted].

Mr. KENDALL. General, I want to get something straightened out in my mind with respect to the statement that you made at the bottom of page 2 of your statement. You say:

We estimate that the Soviet Union now has about [deleted] ICBM's and submarine-launch missiles capable of attacking the United States.

As I understand, the intelligence estimate is about [deleted] ICBM's; is that right, sir?

General JOHNSON. For 1968, the total range of ICBM's runs about [deleted].

Mr. KENDALL. That is estimated [deleted] as I recall.

General JOHNSON. The total would be a little bit less than that as we estimate.

Our range of estimate during that period is [deleted].

Mr. KENDALL. What I really have in mind is that we estimate [deleted] plus ICBM's, and, as I recall, we are also estimating something like [deleted] total ballistic missile and cruise missile submarines, and I cannot make that correspond with the [deleted] additional missiles. What are you excluding, to come up with the [deleted]? Are you carrying the cruise missiles in it?

General JOHNSON. No.

Senator JACKSON. That covers both.

You say [deleted] ICBM's and submarine-launched.

Mr. KENDALL. Yes.

Senator JACKSON. Submarine-launched missiles would be air-breathers as well.

Mr. KENDALL. Yes, sir.

General JOHNSON. No. The submarine-launched missile is not—

Senator JACKSON. Is that cruise?

General JOHNSON. It does not include the cruise missile. That has been a separate category in the intelligence estimates.

Mr. KENDALL. But even in ballistic-missile submarines, the 1968 estimate is [deleted] and I cannot quite square that with your figures which come out with [deleted] total missiles capable of attacking the United States, when, as I recall it, some of the submarines carry up to [deleted] ballistic missiles and the minimum is [deleted].

Senator JACKSON. I am wondering if on that point, your statement says:

"We estimate that the Soviet Union now has about [deleted] ICBM's and submarine-launched missiles."

[Deleted.] Is that not the main point here, as I read this?

You are talking about what they now have on launcher or operational, as distinguished from what is being developed. Now, what do the figures show as to what—

Mr. KENDALL. [Deleted.]

General JOHNSON. Let me give you the specific figures, and let me amend the figures that I have previously given you.

What we estimate now is that there are [deleted] of the early figure that I gave you.

There are [deleted].

In addition, we estimate that there are between [deleted] and [deleted] cruise missiles that are not included in the figure, the [deleted] figure that I gave you.

Senator JACKSON. Of course we do not have cruise missiles operational, right?

General JOHNSON. Well, we have land-based cruise missiles, in terms of MACE.

Senator JACKSON. Yes, I was referring in terms of naval vessels.

General JOHNSON. No.

Senator JACKSON. We canceled ours out.

Mr. KENDALL. The other part of that statement that I need clarified in my mind is the estimate that the Soviet Union is moving to improve its assured destruction capability, and perhaps its damage-limiting capability by a [deleted] increase in numbers of missiles, et cetera. To what does that [deleted] increase refer, and in what time frame are we talking about?

General JOHNSON. In addition to the figures that I have given you, we estimate that there are now [deleted].

Then we estimate that we [deleted].

Mr. KENDALL. So you are looking from now to the future when you estimate the [deleted] increase?

General JOHNSON. That is right, up to about [deleted] in that time period.

UNITED STATES NEEDS BOTH OFFENSIVE AND DEFENSIVE FORCES

Mr. KENDALL. You stress the necessity of deterrence and, very properly, say that it is our first objective. But suppose, by an act of miscalculation or an irrational act of some kind, deterrence should fail?

Obviously, a force which is designed merely for deterrence might not be capable of coping with the facts of life in a nuclear exchange.

What kind of force would we need, in your judgment, in the event deterrence should fail?

General JOHNSON. In my judgment, our force should consist of both offensive and defensive forces, so that not only can we inflict significant damage on the U.S.S.R., but we can reduce the damage that our own country must take—and the damage to our own country that I am speaking about consists of casualties to our civilian population and damage to our industrial base.

FREQUENT REVIEW OF FORCE LEVELS AND OBJECTIVES NEEDED

Mr. KENDALL. We asked General Wheeler, General Johnson, for his assessment as to whether we have a real and present capability to absorb a first strike, and then respond with a force sufficient to inflict unacceptable damage.

We also asked him whether, under present force planning, he was satisfied that that capability would be preserved in the future.

With respect to the latter, he said this:

With respect to future capabilities, the JCS have recommended force levels and operations which would preserve this capability. The dynamic nature of relative capabilities requires that force levels and objectives be reviewed frequently and decisions rendered. [Deleted.]

I would like to ask your comments on that, the extent to which you agree with it, and specifically what you think we ought to do.

General JOHNSON. I share that judgment [deleted] but, referring to General Wheeler's comment of the dynamic nature of our programs, I do not believe that no change is a very likely course for our country to follow.

We are discussing here one of the most difficult areas in which to make judgments. The reason is that the United States and the U.S.S.R. have substantially disparate forces. They are different, and I think we should recall that the U.S.S.R. jumped over the large bomber fleet phase of strategic forces, when they constructed the medium-range and intermediate-range ballistic missile, and installed them on the western border of the U.S.S.R. to the extent of about [deleted] missiles.

Why did they do that?

Because within the state of the art at that time, they could pose a threat to Western Europe, and we were allied to Western Europe at the time that this system was installed. Thus, this deployment enabled the Soviets to use the cities of Western Europe as hostages in the deterrent equation, if you will.

Now, since that time—I might interject first, that at the same time that this MRBM-IRBM force was installed, they were taking defensive measures against our bomber fleet with a very extensive installation of antiaircraft defenses that included the SA-2 missile, which is comparable to our NIKE, and a great many conventional antiaircraft guns of varying calibers and varying ranges, so that they were endeavoring to protect themselves against the threat as they saw it. At the same time, their missile force was providing an offensive threat, not directly against the United States, but indirectly against the United States, because you will recall that the North Atlantic Treaty, to which we are a party, says that an attack against one is an attack against all.

I think this aspect of the relative posture of the two major antagonists is sometimes overlooked.

DAMAGE LIMITING FORCES NEEDED

Now, with regard to what we need to do, General Wheeler also indicated in his statement that should deterrence fail, then our forces must provide for coming out of a nuclear exchange on terms advantageous to the United States. In order to do this, it is clearly evident, first, that we must survive—or a very substantial part of our society must survive—and, second, in order to survive, we must be able to limit damage to ourselves, which we do through the provision of defensive systems.

Now, the only systems that we have at the present time that provide a capability to limit damage to the United States from ICBM's are the SENTINEL system that is presently approved for deployment, and the NIKE-X system, which would expand significantly the SENTINEL system.

HOW MUCH ASSURED DESTRUCTION NECESSARY TO DETER SOVIETS

Now, we cannot rely entirely on defensive forces, and we must continue to have a substantial offensive force. When you then make the judgment as to what level of damage you should inflict on the Soviet Union—or should be capable of inflicting on the Soviet Union—and what the Soviet Union would accept as the upper level of damage, you get into a very speculative area, and I think that when we say that assured destruction means destroying some percentage of the Soviet population, we do not really have any real assurance.

You will recall that in World War II the Soviets absorbed somewhere between 12 and 15 percent population loss. Now, we must recognize that they absorbed this loss over a period of about 3½ years, while the kind of loss that they would suffer in a nuclear exchange would be a very sudden loss over a matter of just a few days. Now, I believe, there would be a very substantial difference in the impact on the Russian population of a loss suffered in this way because of the difference in the way in which these casualties are inflicted. But, I do not think that anyone is in a position to say that a certain level of damage destroys the viability of a society. What element of the society do you destroy? What is it contributing to the total viability of that society?

Now, more specifically, the Joint Chiefs of Staff have recommended an improved MINUTEMAN. They have recommended going to contract definition on an advanced manned strategic bomber. They believe that for the foreseeable future there is a requirement to have a mix of missile and bomber forces, because this poses very great problems for the defense. The Joint Chiefs of Staff also believe that we should have a missile defense system for our country.

I think that covers the questions that you raised.

DEPLOYMENT DECISIONS CONTROLLED BY ASSURED DESTRUCTION CRITERIA

Mr. KENDALL. Yes. However, what troubles me, General, is the fact that the things that you have mentioned have been disapproved, or at least deferred.

I think it has been made pretty clear by Secretary McNamara that the decision to procure and deploy strategic weapons is primarily controlled by how well they meet the assured destruction criteria and that the damage limiting aspects come purely as fallout. As a matter of fact, the clear implications of Secretary McNamara's testimony this year, as I read it, was that damage limiting is no longer a feasible strategy in view of the growing Soviet missile capability and other offensive and defensive strategic weapons, and their capability to produce additional weapons and systems in response to anything we might do.

So, it would occur to me, that, to get the change that you referred to—I believe you said we do not have to assume that the forces will remain the same—there is going to have to be a change on the part of the decisionmakers.

I do not know of any change at this time.

General JOHNSON. Well, I think that you are attempting to be too categorical, and to ascribe a definitiveness and a hardness to certain positions that do not in practice exist. By that I mean contract definition for an AMSA has not been approved, but there has been extensive investigation of the powerplant for the machine, and for the electronics for the machine, and for the weapon system for the machine. You cannot put a machine together until you have a reasonable confidence in the parts of that machine.

Now I noted in one of the earlier testimonies that someone raised the question that the Air Force had not come up with a complete airplane.

Well, you cannot actually come up with an airplane until you go into contract definition, as I understand it. You have to put the whole system—or the components of the system—together. But it does not mean that we are standing still.

FEASIBILITY OF DAMAGE LIMITING STRATEGY

Now, with regard to your statement that a damage limiting strategy is no longer a feasible strategy, I think that that should be qualified by stating that it is less feasible than it was through the single medium of employing offensive forces. You can limit damage to the United States by destroying the force that will inflict damage on the United States prior to the time that it is launched, or you can do it by intercepting the missiles prior to the time they strike the United States. So I think that part of Mr. McNamara's statement was pointed toward the proliferation of ICBM's in the U.S.S.R. and the great difficulty then that this gave in trying to counter those ICBM's in place.

We are a country that has indicated repeatedly that we will not undertake a preemptive strike. Therefore, we have a very real problem because we do not know how many of the holes are going to be filled and how many of the holes are going to be empty.

Mr. KENDALL. Let's go a little further than what Secretary McNamara said, General.

Dr. Enthoven, when he appeared—and I assume, in view of his position, that he was following policy—made it very clear that the decision to procure and deploy our weapons is controlled by the assured destruction criterion. He said very specifically that he did not believe we should invest large amounts of our resources to procure the capability

to perform the other three nuclear missions, that is, limited and controlled retaliation, damage limiting, and preemptive or full first-strike capability.

NUCLEAR SUPERIORITY NOT IMPORTANT IN ITSELF

If that is the policy—he went further, as a matter of fact. He downgraded superiority in the strategic nuclear area, and said that in itself it was not important as long as we maintained what Dr. Foster referred to as a margin of strategic safety, and thus had an assured destruction capability.

These things, coupled with the decision not to approve either going to contract definition or deployment of the systems the Joint Chiefs have recommended, can only lead me to believe that we are very thoroughly at this time tied solely to the assured destruction criteria as far as procuring and deploying additional weapons is concerned, and that it will indeed require some change in the policy of the decision-makers, if we are going to not be faced with the situation that General Wheeler says that he fears will result under presently approved forces.

Would you comment on that, sir?

General JOHNSON. Yes.

I repeat what I said about being too categorical, because I think that I could dispute in part the judgment that you make by just citing the decision to deploy SENTINEL.

Mr. KENDALL. Yes, sir; but that is against China. That is a different question.

SEES SOFTENING IN POLICY AGAINST SOVIET-ORIENTED ABM

General JOHNSON. But Sentinel has the related mission of guarding against accidental launch by any country, including the U.S.S.R. It also has in it, the specific requirement to keep open the option of protecting a part of our MINUTEMAN fields. I think that you would have to say that, in Dr. Foster's testimony, there was some slight softening of the very categorical position that has been followed for the past several years with regard to not providing for a defense against Soviet missiles. At least that is the way I read his testimony.

Mr. KENDALL. That would be tending toward a change in the policy, which is the point I have in mind.

General JOHNSON. I think it simply reinforced the point I made, that we do not now have, and I do not believe that we have ever had, a really rigid policy that it is going to be this, and it is never going to be that. There are no absolutes in defense policy, as I see it, except the single absolute that this country must be defended. I think that is absolute.

CURRENT STATE OF ART NOT ADEQUATE FOR SOVIET-ORIENTED ABM

Senator JACKSON. Right on that point about Dr. Foster and the ABM, I had the impression that Dr. Foster's position has been that he is for a fully deployed system against the Soviets when and if, in his judgment, such a system can be effective. But I had the impression,

when he testified here before, that he feels that the SENTINEL system is effective against the Chinese Communist threat in the early and up to the mid-1970's, or in the seventies, but that to deploy this system against the Soviets would not, at this point in time, be wise, because the system could be overrun in a massive Soviet attack.

General JOHNSON. I think that it is fair to say that.

Senator JACKSON. In other words, he says that the Soviet phase is in the hands of research and development, and that we should make an all-out effort, as we are now, spending about a billion and a half a year to find an answer. But currently, we do not have the answer; therefore, it would not be wise to use the current state of the art as the basis for an ABM system vis-a-vis the Soviets. Is that not basically it?

General JOHNSON. No; I do not believe that he would say—well, I cannot really make a judgment on what Dr. Foster means by what he says. I think that only he could do that.

I think in Dr. Foster's prepared statement he said this:

The SENTINEL system, thin ABM, represents the most advanced missile defense now available, and some components are compatible with a possible future defense against the Soviet Union.

To me this represents more give than the subcommittee counsel would indicate is the case.

Senator JACKSON. Yes. The part there "some components" would be available—

General JOHNSON. Yes.

Senator JACKSON. For use in a follow-on effort.

General JOHNSON. Now, the reason that Sentinel has no effectiveness, or has little or limited effectiveness against Soviet attack, is simply a function of the number of missiles, the number of SPARTANS, the number of SPRINTS, and the number of faces on our missile site radars, coupled, of course, with the density of both the PAR and the MSR.

FULL ABM MIGHT SAVE 10 TO 40 MILLION LIVES

Senator JACKSON. There are those who argue that if you added on and threw in as much as you could, running up to \$40 billion, that it still would not deter the Soviets in getting to the essential targets. That it would not be wise, therefore, at the present state of the art to commence such a full-scale deployment.

General JOHNSON. As I understand it the argument is that the number of American lives that would be saved is not meaningful—and the number of American lives is generally figured as somewhere in the neighborhood of 10 to 40 million, with a median there of about 20.

To me, 10 percent of our population is pretty significant. I suppose that there may be a little bit of emotion attached to this, and perhaps emotion should not enter into defense judgments, but I would only say that in this area I do not believe that there is any position at all for absolute judgments. The reason I say this is that we just do not know enough and we are in no position to judge the state of the opponent's mind.

MULTIPLE SYSTEMS ENHANCE DETERRENCE

Senator JACKSON. On this same point, General, going beyond the Army's immediate role, which, in the strategic areas is to provide for the defense, what do you think our effort should be, in order to have a deterrent advantage over the Soviets?

Let's not talk about superiority. I mean you get into all kinds of semantic definitions which makes it very difficult. But as you see it, looking ahead, and with the progress that the Soviets are making, both in defensive and offensive strategic systems, land based, sea based, air based, and so on, what do you think our strategic effort should be at this time?

I am not asking you to comment beyond your role.

General JOHNSON. I would say that the more uncertainties we can create, the greater likelihood there is of avoiding a nuclear exchange. Therefore, to create uncertainties, you have got to give the other fellow the greatest possible targeting difficulties.

What is he going to have to strike? Where must he strike, when he chooses to strike? This means then that we need multiple systems. We cannot rely on any single one.

I believe that, for technological reasons, we should not rely on any single one, either. This means that we should have seaborne systems: it also means that we should have airborne systems for offense. It means that we should have defensive systems. If it is feasible to develop an airborne defensive system, then I think it is desirable that we have this, when technology permits. If it is feasible to have a seaborne defense system, then I think we should have that, when technology permits. But in the meantime, I believe that we should proceed with the landborne system for which the technology has been relatively proven, and in which confidence has been increased substantially as a result of studies and tests over the past few years.

NUMBER OF U.S. ICBM'S FROZEN

Senator JACKSON. Well, we are making our policy now to freeze our land-based system quantitatively.

General JOHNSON. I do not believe that is the case. We, for the moment, have frozen the number of missiles quantitatively.

Senator JACKSON. That is what I am talking about.

General JOHNSON. But we still are increasing the number of reentry vehicles that we provide, because we are providing multiple warheads on each one of the launchers, and in addition, we have the deeper studies underway as to whether or not we should not alter the kind of missiles that we have, and if we alter the kind of missiles that we have, there is still plenty of room to make a determination that these should be additive to, rather than substitutes for, missiles that we now have.

Senator JACKSON. But what is the magic of 1,054 missiles, 1,000 MINUTEMAN, 54 TITAN II's?

QUALITATIVE VERSUS QUANTITATIVE IMPROVEMENT

As I understand it, we are making qualitative improvements, but looking into the future, should it not be both qualitative and quantita-

tive? I am just wondering if you are going to complicate his problem, whether or not you should not have additional missile sites. You could put multiple warheads in the missile, but when he knocks one of them out, he has knocked out several warheads.

General JOHNSON. That is correct.

Senator JACKSON. So it works both ways. And I just raise the question—as to whether or not the qualitative improvements are sufficient at this point in time, in view of the progress the Soviets have been making, both quantitatively and qualitatively.

We cannot assume that they are not going ahead with the MIRV. In addition, of course, MIRV has never been tested out. We do not know whether it will work. Maybe it will. Maybe it will not. Maybe it will not do some of the things that they say it will, or think it will do.

General JOHNSON. Well, we have tested a [deleted] if you are talking [deleted].

Senator JACKSON. I do not think we have checked out or tested a multiple, independently targeted reentry vehicle.

General BETTS. What we have done in the course of our own test program for defensive purposes is to demonstrate the [deleted] system is pretty straightforward. In other words, we have demonstrated the basic technology that has to be demonstrated.

General JOHNSON. Can we distinguish between demonstrate and test? That is Senator Jackson's question.

General BETTS. There is a step yet to go. Obviously, no one is going to believe we have an operational capability until they have seen it tested in that configuration.

General JOHNSON. I think that we must recall this. We have installed the 1,000 MINUTEMEN in a relatively short time frame, and in that same time frame we have made significant changes to the missiles themselves and to the warheads.

We also are conscious of the fact that there are certain vulnerabilities that we do not yet completely understand, and I think that it is well for us to have a better understanding of [deleted].

So that I think this reinforces Dr. Foster's view that we must maintain a very intensive research and development effort. This is a position that General Betts has supported in a very hard way over the course of the last couple of years.

We cannot abandon a part of our research effort, because so much of our future security depends on the investigations that are presently underway in the research field.

Senator JACKSON. I agree with all that.

My only point is that if your premise, in part at least, in achieving deterrence, is to complicate the problem of the adversary, it would seem to me that there is a need here to give serious consideration to the quantitative aspects of the problem as well as the qualitative. I mean we have set down certain categorical figures, 41 sea-based submarines, POLARIS, 16 missiles each; what is that, 654? Sure, they are going to have multiple warheads. They have multiple warheads now and they are to go to MIRV with the POSEIDON, as I recollect it.

General JOHNSON. The POSEIDON?

Senator JACKSON. But I am just raising the question here as to whether or not deterrence can be maintained by mere qualitative improvements alone. They are doing that, too.

In the last 2 or 3 years, 2 years, we have witnessed a [deleted] increase in their land-based ICBM capability.

General JOHNSON. I do not disagree with that. I believe that the closer that both sides come to equality—and equality is a very difficult term to define, because of what I describe as the difference in the character of the two opposing forces—but the closer we come to equality, the more uncertain we are going to be about our ability to deter.

Senator JACKSON. Just one last question before Senator Symington takes over.

What is our current antisatellite capability?

General JOHNSON. [Deleted.] The reason I am hesitating is, I do not know what the security classification of this is.

[Deleted] and what I would like to do is to provide the rest of the answer for the record, depending upon the nature of the classification. (The information furnished is classified.)

Senator JACKSON. Of the security classification?

General JOHNSON. Yes, sir.

Senator JACKSON. I understand.

More needs to be done in this area; is that not true?

General JOHNSON. I would have to say that I think more needs to be done in all areas.

Senator JACKSON. Yes.

General JOHNSON. Having to do with space.

Senator JACKSON. But I meant [deleted].

General JOHNSON. That is correct.

Senator JACKSON. [Deleted] the present time. Let's put it that way. And as time goes on, and with the [deleted].

General JOHNSON. That is correct.

Senator JACKSON. I want to thank you, General, all three of you gentlemen, for your very fine responses.

Senator SYMINGTON. Good morning, General.

General JOHNSON. Good morning, sir.

Senator SYMINGTON. Mr. Counsel, would you proceed?

SOME TECHNOLOGICAL IMPROVEMENTS NOT YET IN HAND

Mr. KENDALL. Thank you, Mr. Chairman.

I want to go back to one point. I do not necessarily want to debate it at this time. But, we have been told, more than once during this hearing, that a true MIRV [deleted] has not yet been flown.

General BETTS. That is true. A true MIRV has not. But we have tested [deleted].

Mr. KENDALL. There has been similar technology in the space program, too.

General BETTS. That is correct.

Mr. KENDALL. I think Senator Jackson has a very valid point in pointing out that, as against the rather dramatic buildup by the Soviets in missiles in the last few years, we have responded primarily with promised technological improvements, much of which is not yet in hand, such as the MIRV, and dramatically [deleted]. If we do not get these things, it would occur to me that we might be running some risks.

OFFENSIVE AND DEFENSIVE DAMAGE LIMITING FORCES NEEDED

General, I want to go back to the policy question again.

I recognize, as you said, and it is a very valid point, that policies are never fixed in concrete. Whatever our policy is, I hope it is subject to change when conditions require it.

Nevertheless, I think that it is clear that at this time the policy which controls the procurement and deployment of our strategic weapons is assured destruction. Now, let me ask you whether or not you believe that we ought to be limited solely to the assured destruction concept, or whether we ought to have a damage limiting force or an assured destruction/damage limiting force.

General JOHNSON. No; I indicated in my reply that we should have a mixed force, a part of which can assure destruction and a part of which can limit damage to the United States, and General Wheeler's testimony indicated that in the offensive forces we still have, depending upon the number of missiles that remain in Soviet silos, a damage-limiting capability.

But, I also indicated that limiting damage through the use of offensive forces alone cannot assure an effective damage-limiting force, because we do not control the launch of the enemy's force.

Therefore, to provide a capability to limit damage to the United States, a defensive force is necessary—and we need both an offensive and a defensive force.

I think General Wheeler also testified that we continued to target against a part of the Soviet offensive force.

FLEXIBILITY NEEDED TO COPE WITH VARIOUS POSSIBLE SCENARIOS

Mr. KENDALL. Do you not also need an offensive force which is sufficiently flexible to cope with the various scenarios under which war might start?

You may think it is unlikely and I do, but suppose we had a scenario where the Russians had a very controlled attack against us, limited, initially, to our ICBM's and other military installations? We should not be in a position to have to respond solely against their cities, because that would then force them to respond against our cities. So, should we not have some flexibility in that field?

General JOHNSON. I think we do have flexibility in that field now. I think General Wheeler's testimony indicated that our present targeting policy is to target not only against cities but against airfields and against [deleted] their missile force, and we should continue to have that capability.

Mr. KENDALL. [Deleted.]

General JOHNSON. That is correct.

Mr. KENDALL. There are some [deleted].

General JOHNSON. [Deleted.]

Mr. KENDALL. Does that give you any concern?

General JOHNSON. It causes some concern, but perhaps not the depth of concern that other witnesses may have expressed, because whether we can target against them or not gives us no assurance at all that we can hit them, because we do not know and cannot control the presence

of the missiles. We do not know whether the missiles are going to be there, and we cannot control their presence there.

The reason for that is that, as I indicated, it is unlikely that this country would ever permit a preemptive strike.

The second reason for it is, that if by some chance a preemptive strike were launched, it is only reasonable to expect the Soviets to launch a part at least of their missile force on the basis of tactical warning that they had received. They have an early warning system. They can detect the approach of our missiles, or they can detect the approach of our bombers, and once that detection is made, they then are in the position to determine whether or not they would make some kind of a counterlaunch.

Mr. KENDALL. I agree with most, if not all, of what you say.

General JOHNSON. It would be well if we could put a cover over the silo and lock it down some way, but until we get the key to the cover of their silos I see no way to control their launches.

GREATER THROW WEIGHT GIVES SOVIET WIDER CHOICE OF PAYLOAD

Mr. KENDALL. You say, on page 3, that [deleted].

Recognizing that, and I have no particular disagreement with this, and Secretary McNamara has downgraded both megatonnage and gross numbers of ICBM launchers as measures of the balance of nuclear power—and I have no particular disagreement with that—how significant and important in your judgment is the Soviet advantage in throw weight?

General JOHNSON. I think that the Soviet advantage in throw weight [deleted] gives them a wider number of choices as to what kind of payload they will install on their missiles. [Deleted.]

Mr. KENDALL. So, as we look at the argument that the number of warheads on target is one of the best, if not the best, measures of the balance of nuclear power, then it would follow that the admittedly greater throw weight that the Soviets have, particularly in the [deleted] assuming that they [deleted], achieve greater accuracy, add penetration aids, and so forth, gives them the flexibility [deleted].

General JOHNSON. That is correct.

Mr. KENDALL. May I ask you, General—and you have still got your Joint Chiefs' hat on here, I have not gotten to your Chief of the Army hat yet—what, in your judgment, are the Soviet developments in the form of either quantitative or qualitative improvements either offensively or defensively in the strategic nuclear field which would be most unsettling of the balance of power?

General JOHNSON. Well, the [deleted].

I think that would be all I would have to say on that topic.

GENERAL JOHNSON SUPPORTS AMSA AND ADVANCED ICBM

Mr. KENDALL. I take it, General, from what you have already said, that, as a member of the Joint Chiefs, you feel that there is a need for advanced manned strategic aircraft.

General JOHNSON. That is correct.

Mr. KENDALL. What about a hard-target killer in the missile field?

General JOHNSON. I think that this would be most desirable, and it is possible that [deleted].

Mr. KENDALL. You mean in some cases we do not know where [deleted]?

General JOHNSON. [Deleted.]

Mr. KENDALL. Then I take it that you supported going to contract definition on the advanced ICBM [deleted].

General JOHNSON. That is correct.

SENTINEL CAPABILITY AGAINST SOPHISTICATED THREAT

Mr. KENDALL. Going to Sentinel, what capability does Sentinel, as it is now programed, give other than area protection against a light and unsophisticated ballistic missile attack, such as we might expect from the Red Chinese in the next few years?

General JOHNSON. Let me defer that question to General Mayo, if I may, who can give you, I think, harder specifics than I can.

General MAYO. I am not quite sure I understand the question, Mr. Kendall.

The point that I am in doubt about is, I gather you are driving at the ability of the system to discriminate against a more sophisticated threat?

Mr. KENDALL. Yes, sir.

General MAYO. There is inherent within the system, in the SPRINT missile, the capability of using the effect of the atmosphere to delay, chaff and simple penetration aids that might be deployed by an enemy to shield his incoming reentry vehicles.

Mr. KENDALL. May I interrupt?

Are you talking about the present program or some future program?

General MAYO. The present program.

There is this inherent capability, because the SPRINT depends upon action within the atmosphere, and thereby has the programed capability to launch as the reentry vehicle and the accompanying chaff enter the atmosphere, separating, with the SPRINT then acting afterwards to intercept the RV.

Is this responsive to your question, sir?

SENTINEL HAS LIMITED CAPABILITY VERSUS SOVIET THREAT

Mr. KENDALL. Yes.

Specifically, what capability would it have against the Soviets, without penetration aids?

General MAYO. Without penetration aids, it would have a qualitative capability to meet the threat, providing the system, of course, has the opportunity to get warning and react against it.

With penetration aids—excuse me, quantitatively.

General JOHNSON. Let me try this. It has a limited capability against the Soviets because the number of SPARTANS and the number of SPRINTS that we have programed are simply not adequate in number to cope with the number of missiles that the Soviets can launch against us.

Moreover, the density of the system on the ground, that is, the number of sites that we have, protects only a limited part of the United States.

Now our area system, with SPARTAN [deleted] can, depending on the manner in which the Soviets launch their force, have a substantial capability to defend against a Soviet launch.

On the other hand, a massive attack against a single site would penetrate fairly quickly, simply because we do not have enough missiles at any one site to meet incoming missiles in quantity.

Mr. KENDALL. Is there an estimated finite number of Soviet missiles that we could cope with, with the presently programed SENTINEL system?

General JOHNSON. To my knowledge, we have not really investigated that, for the reason that the mission that has been given to the Army is to deploy a system against the Chinese Communist threat, and to provide only incidental protection against anything coming from the Soviet Union. That incidental protection is designed primarily against accidental launch.

Now we have an additional mission, and that is to keep the option open to protect some MINUTEMAN missile fields, but here the number of missiles launched against the fields could range over a rather wide range of numbers. So we do not have any specific number, I would say.

General MAYO. No, sir.

SENTINEL HAS SUBSTANTIAL GROWTH CAPABILITY

Mr. KENDALL. I understand from what you have already said that the Sentinel components are compatible with a more complete system which could intercept missiles with much more highly sophisticated penetration aids.

In other words, it could be used as a building block and be upgraded to cope with sophisticated reentry devices and penetration aids; is that correct?

General JOHNSON. That is correct, the Sentinel system has a very substantial growth capability.

OBSOLETE SAGE SYSTEM FULFILLED PURPOSE

Mr. KENDALL. General, since its inception in the mid-1960's, the United States will have spent something over \$5 billion on the SAGE system for the detection and defense of the United States against long-range bombers, and that, of course, is in addition to what we spent on NIKE-HERCULES, BOMARC, and manned interceptors.

Some members of the subcommittee were rather shocked to find that out of an attack by some 100 bombers on the United States, our present defenses would expect to shoot down only about [deleted] of them, and that, therefore [deleted] percent would be expected to penetrate. This is contrasted with the prediction when these systems were installed that we would have an attrition rate approaching 100 percent, by using these defenses against manned bombers.

Apparently the dramatic decrease in the effectiveness of our air defense system has been brought about by a simple change in tactics, such

as coming in at night at low altitude versus the higher altitude penetration.

I am relating this because the thrust of my question is whether or not there is anything that we have learned from this, and whether there would be any possibility that the NIKE-X system, if we deployed it, could become similarly ineffective in a relatively short period of years.

General JOHNSON. Let me respond three ways:

First, I would suggest that perhaps a part of the reduced effectiveness of the SAGE system has something to do with the number of interceptors that are available for direction by the system, and the number of interceptors has been substantially reduced over these same years.

Point number two is, no one can know whether or not the Soviets at any time during a period in which the SAGE system has been installed have had any inclination to attack the United States. In other words, no one knows the extent to which the presence of the system might in fact have deterred them.

I think our major point is that during the time this system has been installed, there has in fact been no attack on the United States. And I think that as long as we have been free from attack, then one can in one sense at least, justify the expenditure.

Senator SYMINGTON. Would counsel yield?

Mr. KENDALL. Certainly, Senator.

Senator SYMINGTON. General, I have been worried about this light ABM system. This is no criticism of the Joint Chiefs because for years they have recommended we have a true ABM system, instead of this limited system.

General JOHNSON. Yes, sir.

SENATOR SYMINGTON'S REMARKS ON ABM

Senator SYMINGTON. With that premise, I would read into the record some thoughts my own staff and I got up; and have you comment on them, now or for the record, as you like.

After listening to a great deal of testimony before various Senate committees, it is still not clear to me as to just exactly what our policy is with respect to the creation of a partial or a more complete antiballistic missile (ABM) system. I would not be honest if I did not say, at least as of now, that I am not sure what our policy should be among the three choices available, namely (1) no ABM system; (2) partial ABM system (Chinese); (3) full ABM system (Soviet Union).

Part of my doubts in this regard are the result of the shifting opinions in recent months of people in the administration who have presented this matter to the Congress.

CHRONOLOGY OF NIKE SYSTEMS

As background, we might first take up the chronological development of the various NIKE systems. The NIKE-AJAX, which cost approximately \$2.4 billion, has now been abandoned; and the NIKE-HERCULES system has been recommended for replacement by the SAM system.

The NIKE-AJAX was deployed in 1953.

The NIKE-HERCULES was deployed in 1958.

The NIKE-ZEUS development started in 1956.

The NIKE-X development started in 1963 (missile components of this system have been revised since development began).

The recent position of the Department of Defense regarding development and deployment of an ABM system is described as follows:

On January 25, 1967, in a statement before the Committee on Armed Services and Subcommittee on Appropriations, the Secretary of Defense presented proposals for an ABM system, NIKE-X, but recommended against deployment of same at that time.

In this statement, the Secretary listed the following purposes for which the United States might want to deploy NIKE-X:

1. To protect our cities against a Soviet missile attack.
2. To protect our cities against a Red Chinese missile attack in the mid-1970's.
3. To help protect our MINUTEMAN missiles against a Soviet missile attack.

SECRETARY OF DEFENSE REASONS FOR NOT DEPLOYING ABM VERSUS SOVIET

The Secretary of Defense then stated:

After studying the subject exhaustively, and after hearing the view of our principal military and civilian advisors, we have concluded that we should not initiate an ABM deployment at this time for any of these purposes.

In support of this conclusion, the Secretary presented the following reasons:

(1) Increasing the "damage limiting" (defensive) capability of the United States would force the Soviet Union to increase its "assured destruction" (offensive) capability accordingly, and the United States would be in no better position than before. Each country would strive to maintain the "balance of terror."

Second, and this was only a little over a year ago:

"It is not clear that we need an ABM defense against China. In any event, the leadtime for deployment of a significant Chinese offensive force is longer than that required for U.S. ABM deployment; therefore, the decision for the latter need not be made now."

(3) "Other technological developments in offensive forces over the next 7 years may make obsolete or drastically degrade the NIKE-X system as presently envisioned. We can predict with certainty that there will be substantial additional costs for updating any system we might consider installing at this time against the Soviet missile threat."

(4) Deployment of a NIKE-X system would require improvement of other defenses—particularly the fallout shelter program—at a cost greater than Congress has indicated it would support.

(5) Cost, whether \$10 billion or \$40 billion, according to the Secretary, is not a factor in the decision against deployment of an ABM system at this time, but expenditure of said billions on an effective system is a waste of our resources. (Note that in this case the Secretary takes the same fiscal position that he does a year later before the committee, in effect, the expense of such a system was not a factor.)

(6) Maintaining our "assured destruction" capability against the Soviets and as a reaction to their deployment of an ABM around Moscow is a more effective utilization of our resources.

(7) Both the Secretary of Defense and the Director of Defense Research and Engineering recommended against making a decision on deployment of an ABM system pending results of proposed Soviet-United States talks re an agreement on strategic arms limitation, which at that time were expected to commence within a few months.

I might add their recommendations against doing anything here is consistent with their recommendations on just about every other form of weaponry as I analyze it.

SECRETARY OF DEFENSE RECOMMENDS ABM DEPLOYMENT VERSUS RED CHINA

Eight months later, however, the decision to recommend deployment of an ABM against Red China was no longer postponed. In remarks made by the Secretary of Defense in San Francisco on September 18, 1967, he announced the decision to recommend, for reasons yet unknown, deployment of the SENTINEL ABM system to defend against a possible future danger (Red China) instead of the current present danger (the Soviet Union). He opposed deployment of a large-scale ABM system against the latter, stating:

While we have substantially improved our technology in the field, it is important to understand that none of the systems at the present or foreseeable state of the art would provide an impenetrable shield over the United States. Were such a shield possible, we would certainly want it—and we would certainly build it.

The money in itself is not the problem: the penetrability of the proposed shield is the problem. There is no point in spending \$40 billion if it is not going to buy us a significant improvement in our security.

I submit to you, in passing, the various shades of difference of these various statements. Whether you believe in the black or whether you believe in the white, almost everything is a hedge, a shift, a bend. This is what makes it so difficult for one to make up one's mind.

In addition to the above, the Secretary cited the same reasons for not deploying a heavy ABM against the Soviet Union as he did in previous testimony.

Arguments for deployment of the SENTINEL ABM system as a defense against a possible Red Chinese nuclear attack have been almost as numerous as those advanced against deployment of an ABM system as defense against the Soviet Union.

In his announcement of the shift in position in favor of deployment of an ABM defense against Red China, and in subsequent testimony, the Secretary of Defense outlines the reasons for this change. A summary of those reasons follows:

REASONS FOR CHANGE IN POLICY

At the time of the announcement in September 1967, the Secretary stated:

Up to now, the leadtime factor has allowed us to postpone a decision on whether or not a light ABM deployment might be advantageous as a countermeasure to

Communist China's nuclear development. But the time will shortly be right for us to initiate production if we desire such a system.

Moreover, it was argued that the Chinese threat has increased as rapidly as had been expected. Within a period of 39 months they detonated seven nuclear devices; and are now moving ahead with the development of an ICBM.

The Secretary of Defense appeared to base his decision for a "thin" ABM system primarily on a growing belief that the Red Chinese, in their early stage of developing a missile capability, might act in an irrational manner, whereas the Soviet Union, acutely aware of U.S. "assured destruction" capability, would be expected to act more rationally. The Secretary stated:

China has been cautious to avoid any action that might end in a nuclear clash with the United States—however wild her words—and understandably so. We have the power not only to destroy completely her entire nuclear offensive forces, but to devastate her society as well.

Is there any possibility, then, that by the mid-1970's China might become so incautious as to attempt a nuclear attack on the United States or our allies.

It would be insane and suicidal for her to do so, but one can conceive conditions under which China might miscalculate. We wish to reduce such possibilities to a minimum.

And since, as I have noted, our strategic planning must always be conservative and take into consideration even the possible irrational behavior of potential adversaries, there are marginal grounds for concluding that a light deployment of U.S. ABM's against this possibility is prudent.

I do not think I have ever read a more labored syllogistic presentation. The premise could well be that Stalin was a rational man, also the Kaiser and Hitler.

This same line of reasoning was continued by the Secretary in an interview published in *Life* magazine, September 29, 1967, when he said:

We can visualize a situation of tension between Red China and the United States brought about by some aggressive move by the Chinese. In that atmosphere, it is conceivable that someone in their government would predict that the United States was going to launch nuclear weapons to destroy their small and highly vulnerable missile force on the ground. Under those circumstances, some in China might be tempted to recommend that they preempt—that they launch ahead of time, because otherwise they would not be able to launch at all.

In other words, even though the United States, if attacked by Red China with nuclear weapons sometime in the future, could promptly wipe that country off the face of the earth—something which would be more difficult with respect to a preemptive attack by the Soviet Union—nevertheless, we are now being asked to spend billions against this possible small threat, but nothing against the far greater and possibly more imminent threat.

Another reason cited for recommending the SENTINEL ABM system is that deployment of such a system would indicate our desire to deter China from using nuclear blackmail, particularly against other Asian countries, and contribute toward our goal of discouraging nuclear weapon proliferation.

The Secretary of Defense continued:

Further, the Chinese-oriented ABM deployment would enable us to add—as a concurrent benefit—a further defense of our MINUTEMAN sites against Soviet attack, which means that at modest cost we would in fact be adding even

greater effectiveness to our offensive missile force and avoiding a much more costly expansion of that force.

It would appear, even under current cautious application of money, this is the first time that \$5 billion has been characterized as a "modest cost."

SENTINEL NOT DESIGNED AS FIRST STEP IN SOVIET-ORIENTED ABM

The Secretary of Defense, as well as the Director of Defense, Research and Engineering, have been emphatic in stating that, in their opinion, the SENTINEL is not designed as a first step in establishing a thick ABM against the Soviets. There is no evidence that either of these men ever denied such an ABM (SENTINEL) system could not technically be expanded for an ABM defense against the Soviets, but they strongly recommend against such action, because, with the present state of our technology, it would be ineffective.

By this time I am bewildered, really bewildered; in a cave, and have lost my flashlight.

The Secretary stated in September 1967:

The danger in deploying this relatively light and reliable Chinese-oriented ABM system is going to be that pressures will develop to expand it into a heavy Soviet-oriented ABM system.

We must resist that temptation firmly—not because we can for a moment afford to relax our vigilance against a possible Soviet first strike—but precisely because our greatest deterrent against such a strike is not a massive, costly, but highly penetrable ABM shield, but rather a fully credible offensive assured destruction capability.

Let me emphasize—and I cannot do so too strongly—that our decision to go ahead with a limited ABM deployment in no way indicates that we feel an agreement with the Soviet Union on the limitation of strategic nuclear offensive and defensive forces is any of the less urgent or desirable.

The next month, in testimony before the Joint Atomic Energy Committee, the Director of Defense Research and Engineering, Dr. John Foster, argued along the same line in a colloquy with Representative Craig Hosmer (Republican, California):

Representative HOSMER. That confirms the suspicion of some people, at least, that this is really the first stage of an anti-Soviet ABM, as well as an anti-Chinese ABM. Is that right?

Dr. FOSTER. It is certainly not so, and I had not intended to convey that impression.

Representative HOSMER. From the answer you gave, could it be at least in the nature of a building block, if somebody later decided to build upon it to make a full system, rather than a thin system?

Dr. FOSTER. Mr. Hosmer, this is not being deployed as a building block for some heavier system.

Representative HOSMER. I am not asking if it is, I am asking if it were possible, if we changed from thinking thin to thinking thick, that we could build on.

Dr. FOSTER. The thinking may be thick, but it is not that way. Our components, as I indicated previously, are such that if one did want to put batteries around specific cities, one certainly could do that. However, as I have indicated, I believe, as the Secretary does, that the Soviet reaction would be automatic, and we would not be able to end up providing that protection.

In January 1968, the Secretary of Defense, in hearings before the Committee on Armed Services, continued to oppose deployment of a thick ABM system against the Soviets for the same reasons noted

previously, and likewise continued to stress the importance of maintaining offensive forces for assured destruction capability as our major deterrence against Soviet attack.

Reasons noted for deployment of the SENTINEL system against Red China were the same as those previously stated. The Secretary expressed concern that decision to deploy a thin, Chinese-oriented ABM system would make it difficult to maintain proper emphasis upon new developments in ABM systems, although the Defense Department plans to explore new ABM systems by continuing to spend about one-half billion dollars per year in research on same.

The administration continues to support the position that the Sentinel ABM Chinese-oriented system is not designed as a building block for an ABM defense against the Soviets. This is emphasized in the following colloquy during hearings on February 7, 1968, before the Committee on Armed Services:

Senator SYMINGTON. But if I may say so, the Department of Defense specifically stated that it was to protect us from China.

Dr. FOSTER. That is correct, sir.

Senator SYMINGTON. It is not to protect us from the Soviets. Are you saying that actually it is the first step that we could take in protection against the Soviets?

Dr. FOSTER. The statement that was made by Mr. McNamara and concurred in by General Wheeler, was that this deployment is consistent with the first phase of a deployment against the Soviet Union.

I do not recommend the latter because I do not know how to build a system that will do that job. I support Secretary McNamara's position. But General Wheeler, who disagrees with him, believes this should be just the first step, and he supports it.

If we accept the theory that the maintenance of the assured destruction capability; that is, "an ability to inflict at all time and under all foreseeable conditions an unacceptable degree of damage upon any single aggressor, or combination of aggressors—even after absorbing a surprise attack," it is difficult to understand why the same deterrent is not effective against a possible Chinese nuclear attack.

SENATOR SYMINGTON OPPOSES DEPLOYMENT OF SENTINEL

The statements noted above, as well as numerous others made in executive hearings, opposing deployment of a Soviet-oriented ABM system would, in my opinion, appear to be just as applicable in considering a Chinese-oriented ABM system. The often used argument that the Chinese might act more irrationally than the Soviets would appear an illogical basis for spending \$5 billion on the SENTINEL ABM system. This is one of the reasons I recently voted against authorization provision for such a system.

Moreover, accepting the theory of balance of terror, it would seem the United States should channel its resources, thought, and effort, into those areas where it is in the interest of our security and well-being to likewise maintain or strive for a balance—trade, prestige, influence, conventional military forces, diplomacy, and so forth.

General, I apologize for the time taken; but these are the type and character of statements and counterstatements which have us pretty well mixed up.

General Betts and I were talking in this field some 15 years ago.

It was understood what was wanted and why, although some did not turn out. But now we are mixed up.

If the idea is: we do not need a defense because we have such a superb offense, that is one thing; but to try to explain all this difference to my constituents—I cannot make it stick.

People I have tried to explain it to—intelligent Americans, even though not experts in this field—would like to know what this is about.

So, I would appreciate your taking this statement and have your staff and you, yourself, run it down and give us the answers to it.

NIKE FAMILY IS EXAMPLE OF GROWTH SYSTEM

General JOHNSON. I would like to comment just in part and then take the statement and provide more complete answers for the record.

I think that there are three areas in which I would like to comment. I would like to comment on the technology where you started out with AJAX, HERCULES, ZEUS, and NIKE-X. I would point out here that we believe that the Army's air defense systems have been one of the most dramatic illustrations of effective growth systems. AJAX grew into HERCULES, and HERCULES to a limited extent grew into ZEUS. ZEUS then grew into NIKE-X and I think it is interesting to note that we still are shooting AJAX as well as HERCULES at Fort Bliss on McGregor Range down there, and the last figure that I recall is that we have better than a [deleted] percent reliability with AJAX and it is now more than 20 years old. So, it has been a very, very good missile.

Senator SYMINGTON. I think I voted for every request for a missile defense that ever came up from the Army. You spend more in a day in war than you do in a year preparing to stay out of war. I am particularly sensitive about an airplane, the B-36.

Maybe it was as poor an airplane as some tried to make out 30 years ago, but we had no war when it was in operation.

General JOHNSON. Yes, sir; and I would comment to that that we simply are the victims of a technological explosion, and we are just trying to stay abreast.

Senator SYMINGTON. Yes.

General JOHNSON. Now, with regard to leadtimes, our Army studies show that our intelligence is such that we [deleted].

With regard to a thick ABM deployment, here one runs into multiple arguments. I have listened to the technological society argue this question, and there are certain members who say that we will have catastrophic failures.

I must also say, however, that I have never seen anybody demonstrate why this catastrophic failure is likely to occur.

Most of the arguments that one runs into tend to be political and emotional arguments, and we attribute to the other side reactions that we conceivably might take, but that are not necessarily likely for the other side to take.

Now with regard to the response that is attributed to the Soviet Union, our Army studies show that their capability to respond in the scope that is attributed to them is [deleted].

Senator SYMINGTON. To go back to my State and explain to the people of Missouri why we decided to spend billions of dollars, along with all our other problems, to defend against the Chinese, but admit we are not preparing anything to defend against the Soviet Union, I just cannot sell it.

I do not understand why the United States believes we should have half of a ladder if we really want to get to the second floor.

POSITION OF JCS ON ABM HAS BEEN CONSISTENT

General JOHNSON. I would only conclude my response, Senator Symington, by saying that I think that the position of the Joint Chiefs of Staff has been consistent and stable and conservative throughout, and I do not believe that there has been a lot of wavering.

I would only add to that comment that we have said that our security required an offensive force and an active defensive force in terms of both defense against missiles and defense against manned aircraft, and that we should have a passive defensive system, which is the shelter program.

The offensive system and the active defensive system, I would say, are coupled, but not irrevocably coupled. I do not think that they need necessarily be pasted precisely together, but there should be some relationship maintained. The shelter program, I do not think, is necessarily coupled. Yet from the shelter program we get the greatest saving of all for American lives for the least cost.

(Additional comments related to Senator Symington; remarks follow:)

The reasons given by the former Secretary of Defense for not deploying a BMD against the Soviet Union have consistently had an action-reaction theme:

1. The US will act to seek to maintain its assured destruction capability against the Soviet Union, whatever the nature of their defenses.
2. The Soviets will react similarly to any BMD deployed by the US.

Implied, but not always stated, is that the US can continue to assure destruction to a satisfactory level to deter the Soviets despite uncertainties created by growing Soviet offensive and defensive forces. Moreover, there is the question whether the Soviets are indeed unconstrained in their response to NIKE-X.

When no defense against ICBMs was feasible for either side, deterrence through mutual assured destruction may have been stable, although probably not as stable as when the US had strategic advantage but acted under moral constraints. If the Soviet Union attains strategic advantage—for example, by unilateral possession of a BMD effective against an opposing threat, we would be relying solely on moral constraints to their actions. We would not be confident of such a deterrence.

No defense is impenetrable, nor need it be to be worthwhile. For equal cost forces the added sophistication and penetration aids an attacker must employ against a defense act as a "virtual attrition" of the attacking force even before the attack begins. Moreover, the differences in targeting resulting from the presence of a defense can cause some targets to be avoided or attacked ineffectively and survive.

Statements that a "massive" BMD deployment would be "highly penetrable" are based upon an assumption as to offensive force improvements that are not yet demonstrated, and would be expected to be achieved earlier in the US than in the USSR. However, the "massive" deployment is not at issue. The more immediate capabilities and limitations on both major powers would indicate the dispute centers in intermediate levels of deployment and the ability to upgrade them by sophistication rather than by proliferation.

The decision to defend actively against the Chinese threat is really a reinforcement of such deterrence as is obtained by assured destruction alone.

NEED FOR BOMBER DEFENSE IS QUESTIONED

Senator SYMINGTON. I am increasingly suspicious about any real necessity by defending against a bomber offense danger. The Air Force could be building up a situation which could be artificial from the standpoint of any real danger from bombers. The last bomber the Soviets built is considerably less effective in operation and performance characteristics, than one we quit making years ago, the B-58.

The BLINDER is not nearly as good an airplane as the B-58. But it is the newest the Soviets ever built.

The B-52 is all that we have left, and all we felt we should have left, in our offensive force. What is sauce for the goose is sauce for the gander. What the Soviets have left is even more obsolete, from the standpoint of bomber posture, than what the United States plans to have left. I believe the Soviet bomber threat, for whatever reason, has been grossly exaggerated.

Would you comment on this, General?

General JOHNSON. We will comment on this for the record if we may; yes, sir.

(The information furnished is classified.)

QUESTIONS AND ANSWERS FOR RECORD

Mr. KENDALL. Mr. Chairman, the hour is growing late and I know the general has another appointment.

I was going to suggest that I would be glad to submit my questions in writing to be answered for the record, if we can have the understanding that this will be considered an extension of the General's oral testimony, and therefore will come directly from the General to the subcommittee without going through this horrible coordination process.

General JOHNSON. What was the manner in which General Wheeler's responses were made? In the same way?

Mr. KENDALL. He submitted them directly.

Of course, he gave information copies to the Secretary of Defense and to other people, but it did not go through the coordination process.

General JOHNSON. I must be frank to say that I do not know the extent of my authority to make such an agreement.

Senator SYMINGTON. What time do you have to leave?

General JOHNSON. I have a JCS meeting at 2 o'clock.

Mr. KENDALL. Well, let's investigate that, General?

General JOHNSON. Fine.

Mr. KENDALL. General Wheeler was able to do it.

General JOHNSON. I expect that I will be able to submit something.

Senator SYMINGTON. If you cannot, please come back.

General JOHNSON. Yes, sir.

Senator SYMINGTON. At your convenience.

Mr. KENDALL. The point is that we want your opinion, General, rather than having someone else in between us. I am sure you understand that.

General JOHNSON. I understand.

(The questions and answers with appropriate deletions for security follow:)

Senator STENNIS. Secretary McNamara has downgraded both megatonnage and numbers of ICBM launchers as measures of the balance of nuclear power. He feels that the number of warheads on target is a better measure. Assuming that this is correct, isn't it true that the admittedly greater throw-weight which Soviets have, give them the flexibility [deleted]. This, of course, assumes that they MIRV and make other technological improvements than their greater throw-weight makes possible.

General JOHNSON. That is correct. [Deleted.]

Senator STENNIS. As a consequence of the Assured Destruction policy, in general we are not buying forces against the greater-than-expected Soviet threat, but are going through the R&D process which, hopefully, would provide us options to react when intelligence gives us evidence of the increased Soviet threat. In your opinion, how risky is the assumption that our options would truly be viable after Soviet quantitative or qualitative improvements become known?

General JOHNSON. The options available to the US for improvement of its offensive forces include some relatively short lead time items, including proliferation of existing systems. [Deleted.] That is the principal reason we need a mixed force.

Senator STENNIS. During President Eisenhower's administration, our nuclear policy was massive retaliation; then in the early years of President Kennedy's administration, it swung around to counter force or damage limiting; now it is Assured Destruction. Is there any real difference between the massive retaliation and the Assured Destruction concept? If not, haven't we gone a full circle to come back to what is essentially an "all cities" policy?

General JOHNSON. There would be no real difference in full execution of either concept. However, the assured destruction concept contemplates a flexible response with alternative attack options and is therefore not limited to an "all cities" attack policy.

Senator STENNIS. Do you consider this a viable policy that is adequate to protect U.S. security and meet our worldwide commitments? Do you think that this policy was inevitable and that it was forced upon us by the facts of life in this nuclear age? Or do you feel that with the resources available, if properly applied, we could sustain a more flexible national strategy?

General JOHNSON. The Assured Destruction policy alone is not sufficient to protect US security and meet our worldwide commitments. We require forces beyond those needed solely for Assured Destruction. We should have forces of types and quantities to insure, if deterrence fails, the termination of hostilities under conditions of relative advantage to the United States, while limiting damage to the United States and Allied interests. This requires both offensive and defensive forces. The national strategy recommended by the Joint Chiefs of Staff offers far greater flexibility, and is supportable with force levels the US can afford. Mutual Assured Destruction has not been forced on the US as an inevitability of our age.

Senator STENNIS. If we are unable to achieve the projected [deleted]. In view of this, do you foresee a requirement by the U.S. for an ICBM with a greater throw weight than MINUTEMAN provides? What would be the advantage of such a missile?

General JOHNSON. The Joint Chiefs of Staff have supported the development of an advanced ICBM system [deleted]. This capability would permit a payload of MIRVs and/or PENNAIDS which would improve our penetrability of Soviet defenses, and place more RVs and more megatons on target. As I indicated in my earlier testimony, I am not convinced that offensive forces alone will limit damage. [Deleted.]

Senator STENNIS. Admiral Moorer discussed with the Subcommittee his concept of the ballistic missile defense in depth which would incorporate the Army's NIKÉ-X system deployed on land and the Navy's SABMIS system at sea. Would you give us your evaluation of the feasibility of this concept? Apart from the fact that we would have more defense missiles attacking his warheads, how would the mix in defensive ABM's complicate the enemy's penetration problem?

General JOHNSON. [Deleted.]

Senator STENNIS. Although it has not been discussed in these hearings at any length, the Air Force has also proposed a concept of [deleted]. Would you discuss

this in terms of its feasibility and its effect on complicating the enemy's penetration problem?

General JOHNSON. As I mentioned earlier, in my answer concerning the Navy's proposed SABMIS system [deleted].

Senator STENNIS. It would appear that the effectiveness of any ABM system would be highly dependent on the success of the phased array radars, both the Perimeter Acquisition Radar and the Missile Site Radar. Our experience with radars of this type has been somewhat limited. What is the confidence level in successful development of these sophisticated radars? The PAR's and the MSR's would be large and [deleted] fixed installations. Since the system is totally dependent on their operation, what survival factor are you planning for these radars, and what steps will you take to defend them?

General JOHNSON. We now have considerable experience in phased array radar development. Our confidence that the SENTINEL PAR and MSR radars can be developed successfully is very high. MSR components have been extensively tested at Raytheon and a prototype MSR is being constructed at Kwajalein Missile Range. The MAR I, a pre-prototype multifunction array radar, has been operating at WSMR since June 1964 and has successfully demonstrated the capability to track multiple targets. The PAR design is relatively straightforward. The successful development and operation of the Air Force FPS 85 radar located at Elgin Air Force Base increases our confidence. The FPS 85 is a phased array radar that [deleted]. Both SENTINEL radars are being designed to withstand blast over-pressures of [deleted] psi. Radar survivability will be enhanced by including [deleted].

Senator STENNIS. General Johnson, if you were planning an attack on the Soviet Moscow complex and it was defended by a SENTINEL-type system, how would you attack their Perimeter Acquisition Radars and their Missile Site Radars? With what weapons and with what expected probability of success?

General JOHNSON. [Deleted.]

Senator STENNIS. How vulnerable will SENTINEL's radar be to conventional weapons; such as mortars in the hands of saboteurs or dissident elements of American society?

General JOHNSON. As previously covered in my discussion of the nuclear vulnerability of the Perimeter Acquisition Radar and Missile Site Radar, you can see that the construction of the radar buildings will be of such strength as to [deleted].

Senator STENNIS. How effective do you expect the first SENTINEL System to be if it is confronted with penetration aids? Do you anticipate that the CHICOM will be able to develop penetration aids in their early missiles?

General JOHNSON. Let me answer your last question first. Although we [deleted]. With respect to your first question, the SENTINEL system's effectiveness would [deleted].

Senator STENNIS. Will you discuss the options which are available to us for a light, medium and heavy ABM defense of our MINUTEMAN missile force, what the 10-year system cost of these would be, and what results we could expect?

General JOHNSON. The terms light, medium and heavy are OSD phrases for OSD developed levels of defense against various quantitative threats. The light defense is merely the [deleted] arriving reentry vehicles. The investment cost is [deleted]. Ten year operating costs are not high. The median defense is designed to insure survival of [deleted] arriving reentry vehicles. It requires [deleted] missiles. The investment cost is expected to be [deleted]. Ten year operating costs have not been defined. Finally, the heavy defense is designed to insure survival of [deleted] arriving RVs. It requires [deleted] SPRINT missiles at an investment cost of [deleted]. Again, ten year costs are not defined.

Senator STENNIS. Former Secretary of Defense McNamara has said that the U.S. can justify the cost of a major ABM defense only if it could take away the ability of the Soviets to kill Americans. This seems to be self-evident. How would the ability of the Soviets to kill Americans be affected if Posture A of the ABM defense is deployed as recommended by the Joint Chiefs? Can you compare this with the situation which would exist if only the SENTINEL system is deployed?

General JOHNSON. One OSD estimate indicates that with no BMD the Soviets would attain 120 million U.S. fatalities in 1976. With the SENTINEL deployment, it indicates a reduction of 20 million fatalities; and with Posture A, U.S. fatalities would be reduced by 80 million. Another estimate based upon boundary assumptions that all PENAIDS are 100 percent effective and that the defense en-

gages each puff of chaff or decoy, indicates that we would suffer fatalities at the 120 million level, even with SENTINEL. When MIRV or mobile ICBMs are added to this scenario, Posture A would reduce U.S. casualties by 10 million. Our Army studies, however, which are based on logical assumptions as to Soviet targeting, and take into consideration counter-force as well as counter-value strikes, show that with Posture A U.S. fatalities would be sharply reduced, if there were no Soviet counter-response. Posture A against a MIRV response would reduce U.S. casualties by 60 million, and only a full Soviet counter-response to Posture A, at a cost to them exceeding the cost to us of the NIKE-X deployment, would restore U.S. fatalities to nearly the no-defense level. It is significant that in this case damage and fatalities would be distributed differently than in the no-defense case, and some of our major [deleted]. Without augmentation, the SENTINEL deployment is vulnerable to SLBM and FOBS attack. This is not an inherent weakness of the system, but an intentional characteristic of the deployment plan, oriented primarily against the Chinese Communists. The defense recommended by the Joint Chiefs of Staff covers all directions of attack and would have substantial capability against both SLBM and FOBS. In his 1967 Posture Statement, the Secretary of Defense indicated a favorable cost exchange ratio to the US for US fatalities levels of 44 million or higher. That assumed we were to concede that the Soviet response was substantially unconstrained. At the objective force level for planning recommended by the Joint Chiefs of Staff, such a defense is by no means easily, cheaply or inevitably overcome.

Senator STENNIS. What is your view as to what we should do in the field of civil defense?

General JOHNSON. An effective fallout shelter program would save the most lives for the least cost and would effectively complement active defenses. Shelters attained by "slanting" new construction are less costly than single purpose shelters. We should speed up this program and at the same time make improvements in our warning dissemination system. In the latter case I am referring to the decision information distribution system (DIDS). Shelter identification, marking and stocking and civil defense training are other important parts of the Civil Defense program. The military shelter program also should be supported.

Senator STENNIS. In your opinion, can an effective ABM system be developed and deployed against the Soviet missile threat? What would such a system cost and what level of effectiveness would you expect from it?

General JOHNSON. The NIKE-X development program which has provided the elements included in the SENTINEL deployment is continuing to develop additional improvements. The NIKE-X II-68 deployment, exclusive of any possible supplement by SABMIS [deleted] would cost about [deleted] billion dollars including the SENTINEL deployment which served as an initial basis. I would expect this defense to provide for the survival of the national entity of the US against the Soviet threat, including likely responses into the late 1970s. Such a defense would not only save the lives of millions of Americans but would result in reduced losses of industry, government, transportation centers and communications.

Senator STENNIS. On the other side of the coin, do you think the Soviets could develop an effective ABM system against our offensive missiles? What would such a system cost and do you think it would change the balance of power?

General JOHNSON. [Deleted.]

Any reduction in our strategic capabilities vis-a-vis the Soviets and any increase in theirs results in a change in the balance of power to the detriment of the United States. The danger lies in the fact that as this alteration in the balance of power proceeds, the Soviets may at some point conclude that they have, in fact, attained a strategic superiority to a greater or lesser degree depending upon these force interactions. Such thinking on the part of the Soviets could have serious consequences for the United States, particularly if the Soviets persuade themselves that they are less deterred than is the United States.

Senator STENNIS. In the absence of a capability to test nuclear weapons in the atmosphere for weapons effects, what level of confidence will we have that SPARTAN and SPRINT will actually be able to neutralize incoming warheads? What, for example, do we know about radar blackout phenomena?

General JOHNSON. We have a high degree of confidence that the SPARTAN and SPRINT will be able to neutralize incoming warheads. Extensive effectiveness studies have been made incorporating system accuracy, warhead kill effects, and postulated reentry vehicle hardness. [Deleted.] These results have been

analyzed extensively and the basic phenomena are believed to be well understood. Underground tests have continued, of course, and specific underground tests of the SPARTAN and SPRINT warheads are planned to obtain precise effects data to [deleted].

Senator STENNIS. When did the Army first recommend deployment of NIKE-ZEUS? In retrospect, now do you think it would have been a mistake to deploy ZEUS at that time?

General JOHNSON. The Army recommended NIKE-ZEUS deployment in 1959. If the system had been deployed as the Army recommended at that time, it would be effective against the present Soviet threat, as well as the expected Chinese Communist threat against which we are deploying the SENTINEL system. The deployment would have been costly, and the technology would be inferior in comparison to SENTINEL. However, it can only be argued that it would have been a mistake to deploy NIKE-ZEUS by hinging one's case on the fact that we have not experienced an ICBM attack and therefore would never have had cause to use it. If such a war had come in the decade following 1959, I expect the failure to deploy NIKE-ZEUS would have been viewed as a mistake.

Senator STENNIS. I understand that you are programming an IOC of [deleted] and an FOC of [deleted] for SENTINEL. Recognizing that all the major elements of the SENTINEL System, that is, the PAR's and MSR's, and the SPARTAN and SPRINT missiles are all under development, how do you evaluate the risk factor that these operational dates will slip?

General JOHNSON. The operational dates were established in recognition of the risk factors involved. As you stated, the major elements of the SENTINEL System are either well along in development or the technology required is well established. Taken individually, the risk factor for successfully deploying each element on time is not unusually high. However, we recognize that there is some increase in the risk factor when all parts of the system, considered as a whole, are required to be operational as a system. There are possibilities for delays in one portion of the system which will affect the orderly deployment of the remaining portions. From a technical standpoint, we believe the operational dates can be met, but recognize the complex problems inherent in a long range program of this magnitude.

Senator STENNIS. What are the projected 10-year system costs for: (1) SENTINEL, (2) NIKE-X Posture A, (3) NIKE-X Posture B?

General JOHNSON. 10-year system costs are: (1) SENTINEL: [deleted] billion, (2) NIKE-X Posture A: [deleted] billion, (3) NIKE-X Posture B: approximately [deleted] billion. (Estimated at [deleted] billion in 1966; not re-evaluated in detail since that date.)

Senator STENNIS. In answer to a Subcommittee question, General Wheeler made the following observation: [Deleted.] You have indicated that you share General Wheeler's judgment, but that you believe there will be changes—that options available to us will be exercised.

Even assuming that the options available are viable, aren't there very powerful forces militating against *timely* decisions to exercise the options? I.E.: (1) Deployment decisions invariably require commitment of tremendous sums of money. (2) They must be based, usually, on quite "soft" intelligence and, therefore, the deployment commitment must be made under conditions of great uncertainty as to the true validity of the requirement.

General JOHNSON. Experience would show that with the passage of time additional deployments and the exercise of various options not currently approved will be exercised. The degree to which we exercise these options does vary with the costs attendant to each. On the other hand, a substantial improvement in capability such as POSEIDON represents over POLARIS is exercised when the threat is recognized in time. I would agree that some of our important decisions must be made under conditions of great uncertainty. For example: there is an uncertainty of several years in the date when the Chinese will achieve a substantial operational capability with an ICBM; however, the favorable decision for deployment of the SENTINEL system was made in the face of this uncertainty when it became clear that only the date of the threat and not its nature were in doubt. I repeat that I expect changes in the Secretary of Defense's program; otherwise, I would be more concerned.

Senator STENNIS. In his testimony, the Secretary of the Air Force identified two criteria in addition to Assured Destruction which should help shape our

strategic policy : After a nuclear exchange (1) ratios of surviving population and industry must not be badly adverse to the United States, and (2) the surviving military balance should remain in our favor. If these criteria are part of the measure of deterrence, by what yardstick do we measure the price we are willing to pay for them? What do we need to build into our forces to meet them? Do you think these two criteria are recognized widely in the Department of Defense as valid measures of deterrence?

General JOHNSON. The yardstick by which we measure our willingness to support a military program varies with our responsibilities. The Joint Chiefs of Staff, with responsibility for the military defense of the U.S., would consider that the risks of damages from nuclear exchange should be no higher than we can reasonably afford. That is to say, we might afford a proportion of our GNP not greater than we would devote to the conduct of general war. Certainly that would be less than the cost of losing such a war. On the other hand, the Commander in Chief or the Congress might consider seriously adverse economic impact as a limit in establishing the price we are willing to pay. To keep our surviving industry in balance with surviving population, it is clear that we must have substantial active defense of our urban/industrial centers. This must be in balance with passive measures to improve survivability of both population and facilities. Ballistic missile defenses, air defenses, and ASW all would contribute to deterrence in combination with offensive forces for Assured Destruction and counter-military targeting. It is clear that we must maintain the capability to strike hard as well as to parry a hostile blow. I think these criteria have been recognized in part in the Department of Defense but are only recently gaining acknowledgement as measures of deterrence. The Army has led the way recently in studies of post attack conditions, the requirement for survival of the national entity and recognition that a general nuclear exchange does not obliterate the nation. Among the things we do not know are the degree of damage which the Soviets would be willing to sustain in exchange for inflicting a given level of damage to the U.S. We have some evidence that, as of today, such an exchange would leave the U.S. with a GNP exceeded only by that of the U.S. and the Soviet Union prior to the exchange. Were this estimate greatly in error I should think that the Soviets would still take into consideration their likely relative position after the exchange as they perceive it, and we must maintain a balance favorable to us in their eyes if they are to be deterred.

Senator STENNIS. The deployment scheme for SENTINEL places them in proximity to [deleted]. Has this problem been the subject of study within the Defense Department? If so, what were the conclusions?

General JOHNSON. The question as to whether [deleted] has been under study for some time. Final conclusions are not yet available. [Deleted.] It will be several months before the plan is approved.

Senator STENNIS. Would it not be true that a Spartan missile with a [deleted].

General JOHNSON. The statement of your question sets forth quite clearly the basic problem of [deleted] and the time available during which each of these operations can take place.

Senator STENNIS. As a follow-on to the above question, will it be possible to have [deleted].

General JOHNSON. We think so, however this will require [deleted].

Senator STENNIS. At this time, do we have any certainty as to how to proceed in meeting this problem?

General JOHNSON. [Deleted.]

Senator STENNIS. [Deleted.]

General JOHNSON. [Deleted.]

Senator STENNIS. [Deleted.]

General JOHNSON. [Deleted.]

Mr. KENDALL. Let me say, sir; since this may be the last time I have the opportunity to talk to you, at least, in this particular position, that I appreciate all the courtesy and advice and assistance you have given me over the years, and I wish you the best for the future.

General JOHNSON. Thank you very, very much.

Senator SYMINGTON. I want to join Mr. Kendall.

Let me thank you and your staff for your kindnesses to my office and to this subcommittee, also the wisdom you have presented to this subcommittee and the full committee. It has been a pleasure knowing you, sir. You make we very proud of the U.S. Army.

General JOHNSON. Thank you very much, sir; and I am grateful for the cooperation and and consideration that the committee has given to me and the understanding that they have had for the problems that have confronted the Army.

Senator SYMINGTON. Thank you.

We will recess the hearing, subject to the call of the Chair.

(Whereupon, at 12:30 p.m., the hearing was recessed, subject to call of the Chair.)



Let me thank you and your staff for your kindnesses to my office and to this subcommittee, also the wisdom you have presented to this subcommittee and the full committee. It has been a pleasure knowing you, sir. You make us very proud of the U.S. Army.

(General Johnson: Thank you very much, sir; and I am grateful for the cooperation and consideration that the committee has given to me and the understanding that they have had for the problems that have confronted the Army.

Senator Stevenson: Thank you.

He will recess the hearing, subject to the call of the Senate.

(Whereupon, at 12:30 p.m., the hearing was recessed, subject to call of the Senate.)



