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# THE ACQUISITION OF WEAPONS SYSTEMS

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## HEARINGS BEFORE THE SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT OF THE JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES NINETY-THIRD CONGRESS

FIRST SESSION

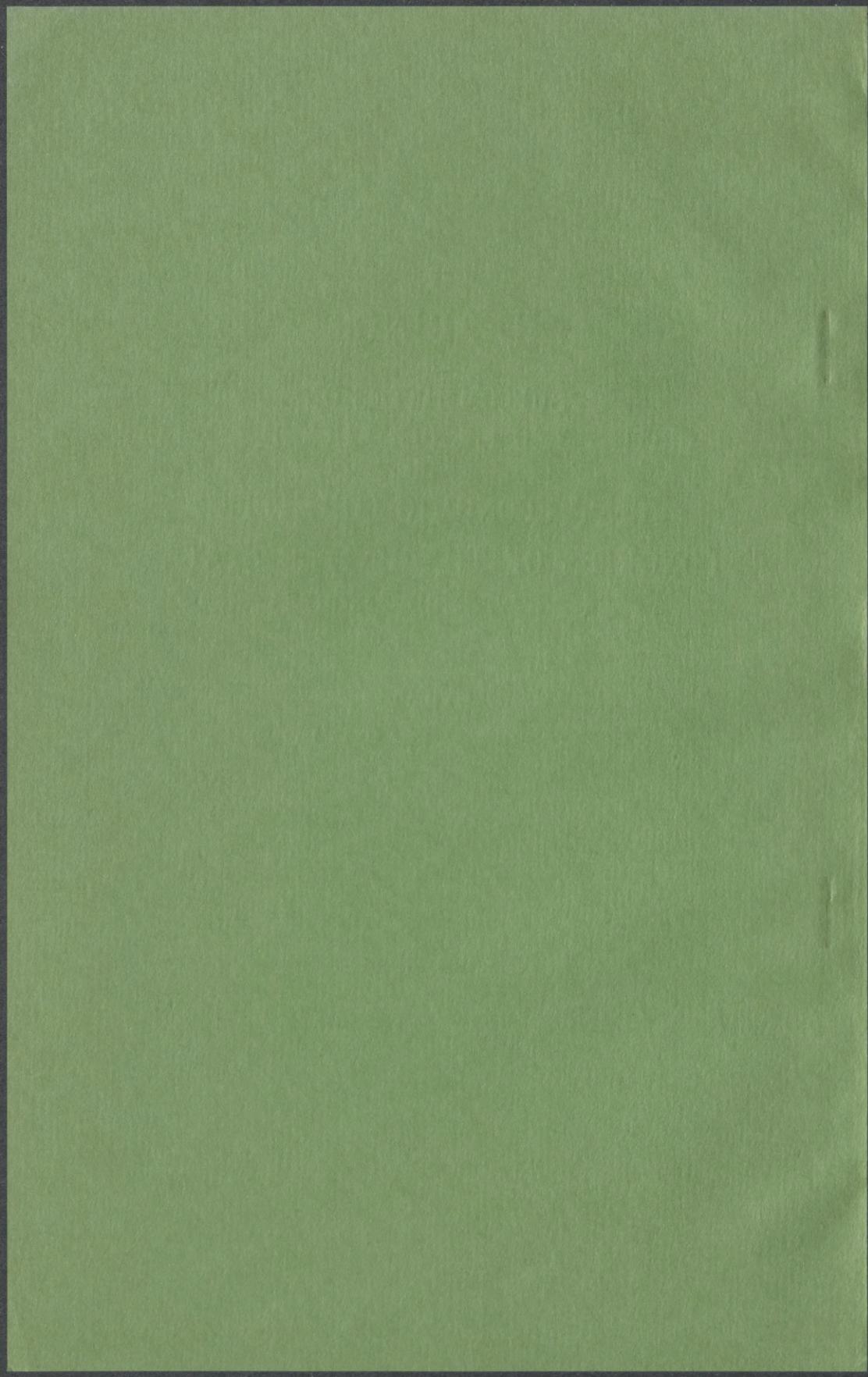
PART 7

NOVEMBER 14, 15, AND 16, 1973

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# THE ACQUISITION OF WEAPONS SYSTEMS

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# CONTENTS

## WITNESSES AND STATEMENTS

WEDNESDAY, NOVEMBER 14, 1973

Proxmire, Hon. William, chairman of the Subcommittee on Priorities and Economy in Government: Opening statement.....	Page 2537
Staats, Hon. Elmer B., Comptroller General of the United States, accompanied by Thomas D. Morris, Assistant Comptroller General; Richard W. Gutmann, Director, Procurement and Systems Acquisition Division (PSAD); James H. Hammond, Deputy Director (PSAD); Paul Shnitzer, Associate General Counsel, Office of the General Counsel; Frances Marvin Doyal, Supervisory Auditor, New Orleans, La.; and George Wooditch, Supervisory Auditor (PSAD).....	2539

THURSDAY, NOVEMBER 15, 1973

Proxmire, Hon. William, chairman of the Subcommittee on Priorities and Economy in Government: Opening statement.....	2591
Yuspeh, Larry, staff associate, Center for Defense Information.....	2592
Fitzgerald, A. E., consultant, and former Deputy for Management Systems, Office of the Assistant Secretary of the Air Force.....	2624
Art, Robert J., professor of political science, Brandeis University.....	2658

FRIDAY, NOVEMBER 16, 1973

Proxmire, Hon. William, chairman of the Subcommittee on Priorities and Economy in Government: Opening statement.....	2707
Mendolia, Hon. A. I., Assistant Secretary of Defense (Installations and Logistics), accompanied by J. M. Malloy, Deputy Assistant Secretary of Defense (Procurement), Office of the Assistant Secretary of Defense (I. & L.) and Don R. Brazier, principal deputy to the Assistant Secretary of Defense (Comptroller).....	2708
Bowers, Hon. Jack L., Assistant Secretary of the Navy (Installations and Logistics); accompanied by Rear Adm. R. L. Baughan, Jr., major surface combatant ships project manager; Rear Adm. K. L. Woodfin, Deputy Chief of Naval Material (Procurement and Production); Rear Adm. S. J. Evans, Director of Contracts, Naval Air Systems Command; Capt. W. J. Ryan, Director of Procurement, OASN (I. & L.); E. G. Lewis, General Counsel of the Navy; and R. A. Carl, Special Assistant to ASN (I. & L.) for Transportation.....	2716

## SUBMISSIONS FOR THE RECORD

WEDNESDAY, NOVEMBER 14, 1973

Staats, Hon. Elmer B., et al.: Prepared statement.....	2547
Response to Chairman Proxmire's query regarding the weight increase in the B-1 bomber.....	2573
Response to Chairman Proxmire's request for information clarifying the Navy's estimate of the total Trident program cost.....	2577
Response to Chairman Proxmire's request for examples of programs for which total production costs are not now provided to Congress through the SAR's.....	2578
Text of section 2202, title 10, United States Code.....	2585

## IV

THURSDAY, NOVEMBER 15, 1973

	Page
Art, Robert J.:	
Prepared statement.....	2665
Fitzgerald, A. E.:	
Exhibits to oral statement.....	2630-2635
Appendix A to oral statement.....	2635
Appendix B to oral statement.....	2648
Prepared statement.....	2650
Response to Chairman Proxmire's request to supply for the record a copy of the Civil Service Commission's decision reversing the action of the Department of the Air Force in the dismissal of Mr. Fitzgerald.....	2673
Yuspeh, Larry:	
Study entitled "The General Advantages of Competitive Procurement Over Sole Source Negotiation in the Defense Department," prepared for the use of the Subcommittee on Priorities and Economy in Government, by Larry Yuspeh, November 12, 1973.....	2598

FRIDAY, NOVEMBER 16, 1973

Bowers, Hon. Jack L., et al.:	
Prepared statement.....	2721
Response to Chairman Proxmire's request for information concerning contractors submitting grossly inflated claims against the Navy....	2731
Response to Chairman Proxmire's request for information concerning possible fraud in the Litton 680 submarine claims case.....	2733
Response to Chairman Proxmire's request for the date the Navy began its investigation into possible fraud in the Litton case.....	2734
Response to Chairman Proxmire's query regarding what litigation Litton had in court against the Navy to justify Navy resumption of progress payments to Litton.....	2743
Response to Chairman Proxmire's request for information regarding the study by a Navy team at Grumman during the period July 25-November 30, 1971.....	2747
Response to Chairman Proxmire's request for comments on the testimony of A. E. Fitzgerald before the Subcommittee on Priorities and Economy in Government, November 15, 1973, regarding the should-cost concept.....	2809
Fitzgerald, A. E.:	
Letter to Chairman Proxmire from A. E. Fitzgerald, dated March 13, 1974, responding to the comments of Assistant Secretary of the Navy Bowers, Assistant Secretary of Defense Mendolia, and Comptroller General Staats on Mr. Fitzgerald's testimony of November 15, 1973.....	2810
Mendolia, Hon. A. I., et al.:	
Prepared statement.....	2712
Response to Chairman Proxmire's query regarding the feasibility of DOD initiating a new profit data collection system which will produce return-on-capital data for all contracts.....	2741
Response to Chairman Proxmire's request for names of the programs to which predetermined cost ceilings have been established and the amounts of those ceilings.....	2751
Response to Chairman Proxmire's request to supply for the record what actions will be taken to monitor prime contractors' subcontract programs.....	2753
Response to Chairman Proxmire's request for a written reply to Mr. Yuspeh's study entitled "The General Advantages of Competitive Procurement Over Sole Source Negotiation in the Department of Defense," and similar examples of competitive buys following sole-source awards over the past 5 years.....	2757
Response to Chairman Proxmire's request for comments on the testimony of A. E. Fitzgerald before the Subcommittee on Priorities and Economy in Government, November 15, 1973, regarding the should-cost concept.....	2809

## POINTS OF INTEREST

WEDNESDAY, NOVEMBER 14, 1973

Proxmire, Hon. William:	
Opening statement:	Page
\$18.5 billion to subcontractors—waste and kickbacks apparent..	2537
GAO report on Litton subcontracting practices.....	2538
Colloquy and interrogation:	
Staats, Hon. Elmer B., et al.:	
Kickback on large crane purchase by Litton Shipbuilding..	2565
Case 1: Niedermeyer lumber subcontract.....	2566
Role of payments by Ingalls to Benton.....	2567
Facts of the "Gulf Coast" case.....	2568
Conflict of interest and the antikickback law.....	2569
Facts of the condenser service case.....	2569
Need more adequate controls on subcontracting practices..	2570
Facts of the Daco Industries case.....	2571
Roy Ash—responsible for irregularities.....	2571
B-1 Bomber—\$2 billion cost increase.....	2573
Air Force changes inflation factor almost at will.....	2575
More problems with the inflation factor.....	2575
\$56 million per B-1 Bomber.....	2576
Original B-1 cost estimate—\$35.8 million.....	2576
More than \$11.9 billion for Trident submarine program.....	2576
Suggested improvements for reporting weapons costs.....	2577
\$11.9 billion Trident program cost does not include warhead costs.....	2578
More on the B-1 Bomber.....	2579
Classified costs.....	2579
More use of program unit cost in GAO reports.....	2580
Delivery schedule and performance information in GAO reports.....	2581
Inventory of weapons systems being procured.....	2581
Navy lax on using should-cost studies.....	2582
Can should-cost get the fat out.....	2582
Should-cost methodology needs improvement.....	2583
Should-cost versus will-cost.....	2583
Office of Federal Procurement Policy—not under White House and OMB control.....	2584
Not even the President can make directives concerning Defense Department procurement policies.....	2584
Can the Procurement Commission be independent of the President's control?.....	2586
Structure of Office of Federal Procurement Policy.....	2586
More on the build and charter program.....	2587
Staats, Hon. Elmer B., et al.:	
Oral statement:	
Commission on Government Procurement determines need for stronger executive leadership.....	2539
More information on procurement before Senate Government Operations Committee.....	2540
Navy build and charter program.....	2540
Which costs more—lease or purchase?.....	2541
Conclusions and suggestions for legislation.....	2541
Suggested changes in selected acquisition reports.....	2542
Results of selected should-cost studies—Navy falls behind Army and Air Force.....	2544
Navy—only two should-cost studies since 1967—Mark 48 torpedo is one.....	2544
Commission on Government Procurement suggestions to im- prove purchase of architect engineering services.....	2545
Ingalls shipbuilding of Litton—possible illegal or improper action activities.....	2546
More attention should be focused on prime contractors' pro- curement practices.....	2546

## VI

## Staats, Hon. Elmer B., et al.—Continued

Prepared statement:	Page
Office of Federal Procurement Policy.....	2547
Build and charter program.....	2548
Selected acquisition systems.....	2549
Financial status reports on selected acquisitions.....	2550
Should-cost studies.....	2550
Architect and engineering services (A. & E.).....	2551
Selected subcontracting activities at Litton Pascagoula shipyard..	2551
Additional work by GAO in the area of prime contractors' procurement activities.....	2552

THURSDAY, NOVEMBER 15, 1973

## Art, Robert J.:

Oral statement:	
Inefficiency causes high weapons systems cost.....	2658
Unilateral goldplated disarmament.....	2658
Organizational essences cause goldplating.....	2658
Mobilization mentality—Military emphasis on quality, cost ignored.....	2659
Services should not maintain control over actual development.....	2660
Shared interests cause higher prices.....	2660
Don't tie profits to contractor efficiency.....	2661
Use interservice rivalry to reduce, not to increase, costs.....	2661
Tie the number of upper grade slots to force levels to reduce goldplating.....	2662
Determine accurate military requirements through occupational testing.....	2662
Military should not have total control over weapons development..	2663
Program managers—Not in their interest to prevent goldplating..	2663
Need for independent evaluation and text agency to prevent goldplated weapons systems.....	2664
Biggest defense firms should be producers, not just developers, of weapons systems.....	2664
Prepared statement:	
The enduring problems.....	2665
Proposals for reform.....	2668

## Fitzgerald, A. E.:

Oral statement:	
Enormous potential for cost reduction in military procurement—Some obstacles to overcome.....	2624
Compete tenancy of Government-owned plants.....	2625
Clarifying the importance of learning curves.....	2626
Army should-cost study censored and esoteric.....	2626
How a should-cost study is done.....	2627
Squeezing the fat out of the Standard missile.....	2628
A \$400 television for \$8,000—Comment on contractor inefficiency..	2629
Attempts to undermine should-cost efficiency.....	2629

## Proxmire, Hon. William:

Colloquy and interrogation:	
Fitzgerald, A. E.:	
On the reinstatement of A. E. Fitzgerald by the Defense Department.....	2672
Should-cost experts stifled by the Defense Department.....	2682
Defense Department destroys the lives of those who try to reduce weapons systems costs.....	2688
Compete subcontracts.....	2690
Defense contractor's prices are high and profits are low—Why?.....	2691
Should-cost studies—Effectiveness and scope.....	2694
Should-cost quantifies the fat.....	2694
Low labor efficiency in defense production.....	2696
\$300 calculator for \$6,000; \$100 tape recorder for \$2,000—inefficiency in defense production.....	2696
Defense contractors respond to customer demand—DOD gets what it wants.....	2697

VII

Proxmire, Hon. William—Continued

Colloquy and interrogation—Continued

	Page
Fitzgerald, A. E.—Continued	
Inefficiency rewarded by the Defense Department.....	2697
Defense contractors threaten unemployment if contract cuts suggested.....	2698
Procurement process in the Defense Department should be civilianized.....	2703
Why is the procurement process in the Defense Department so inefficient?.....	2705
As long as money is readily available for any purpose, motivation to be efficient will be undermined.....	2705
Yuspeh, Larry:	
Competition is rare in the Defense Department.....	2689
How to make competition more common.....	2689
Compete subcontracts.....	2690
Time important in consideration to compete.....	2699
Main obstacles to competition—DOD's point of view.....	2700
Force defense contractors to provide complete data packages.....	2700
Necessity of should-delivery dates.....	2700
DOD contracting officials unaware of the minimal use of competition for procuring weapons systems.....	2701
Competition used to procure mostly small parts.....	2702
More on the importance of time—Avoiding emergency buys.....	2702
Art, Robert J.:	
Defense contractor's prices are high and profits are low—Why?.....	2691
Need for restructuring weapons systems development in the Defense Department.....	2692
Move to subcomponent development.....	2693
Which labs more efficient—Private or public sector?.....	2693
Only competition is a possible alternative to should-cost.....	2699
Too much control by the military of DOD procurement.....	2702
Procurement process in the Defense Department should be civilianized.....	2703
Yuspeh, Larry:	
Oral statement:	
Efficient procurement crucial for saving tax dollars.....	2592
Three reasons why competition should be used more often.....	2593
Price reductions result from shift from sale source to competitive..	2593
Winner-take-all competition gives greatest savings.....	2597
Sole source negotiation should be used only after careful congressional scrutiny.....	2597

FRIDAY, NOVEMBER 16, 1973

Bowers, Hon. Jack L., et al.:

Oral statement:	
Problem: Translating technology into economical, efficient systems.....	2717
Improve acquisition management to lower procurement costs.....	2717
Necessary changes in project management.....	2717
Contract form should be consistent with incurred risks.....	2718
Awards should be made only to contractors who make firm commitments.....	2718
Emphasize contractor's track record in awards process.....	2719
Program execution: Convert requirements into reality.....	2719
Genuine cost control through better project management.....	2720
Use, build, and charter method after congressional approval.....	2720
Navy uses "mini" should-cost instead of comprehensive form.....	2721
Prepared statement:	
Management.....	2722
Contract form.....	2722
Award process.....	2722
Program execution.....	2723
Build and charter.....	2724
Claims.....	2724

## VIII

Bowers, Hon. Jack L., et al.—Continued	
Prepared statement—Continued	Page
Should cost.....	2725
Progress payments.....	2725
Mendolia, Hon. A. I., et al.:	
Oral statement:	
Navy desires competition, but can't implement it often.....	2709
Formal advertising used mainly for supplies and services not appropriate for acquiring weapons systems.....	2709
DOD uses competitive negotiation.....	2709
Large amount of Defense Department procurement not on competitive basis.....	2710
New progress payments for shipbuilding based on costs incurred and physical progress.....	2711
Pension fund payments must be made during a company's fiscal year.....	2711
More attention to "design-to-cost".....	2711
Should-cost worthwhile mostly for negotiated contracts.....	2711
Prepared statement:	
Competition.....	2712
Subcontracting.....	2714
Progress payments.....	2714
Progress payments (cost based plus shipbuilding) amounts outstanding (unliquidated).....	2714
Changes in progress payment policy.....	2715
Contractor retirement fund payments.....	2715
Cost control.....	2715
Should-cost.....	2715
Cost accounting standards.....	2716
Proxmire, Hon. William:	
Opening statement:	
Oversized military establishment distorts the domestic economy..	2707
An overly extravagant military program weakens the United States.....	2708
Colloquy and interrogation:	
Mendolia, Hon. A. I., et al.:	
Defense Department largest single oil purchaser—Accounts for 10 percent of present shortage.....	2725
Steps taken to reduce Defense Department oil consumption..	2726
DOD pays 40 percent to 50 percent more for oil—Consumes a billion more in dollar cost.....	2726
Mendolia driven to work in chauffeur-driven limousine.....	2727
Discontinued use of chauffeur-driven Government cars—An important symbol.....	2727
Will DOD cut back on the use of chauffeur-driven automobiles?.....	2729
Cutback on helicopter use in the Washington area.....	2729
Will DOD reduce use of command and support aircraft?.....	2730
Military should use commercial flights more often.....	2731
Pilot project on using capital investment to determine profits—No volunteers.....	2738
Defense Department does not collect return on investment data.....	2739
If profit data unknown, how do DOD people determine that profits are low?.....	2740
DOD contractors hold back retirement fund payments—DOD allows this for up to 4 months.....	2748
Prompt retirement fund payment is the right thing to do, regardless of Government requirements.....	2749
No cost ceiling yet for the B-1 Bomber.....	2750
Subcontracting procedures reviewed by the Defense Department.....	2753
DOD reacts to the subcommittee study on competitive procurement.....	2754
Competition brings high price reductions by reducing overhead.....	2757

## IX

## Proxmire, Hon. William—Continued

## Colloquy and interrogation—Continued

## Mendolia, Hon. A. I., et al.—Continued

DOD reaction to A. E. Fitzgerald's view that should-cost technology has been diluted..... 2711

## Bowers, Hon. Jack L., et al.:

Discontinued use of chauffeur-driven Government cars—An important symbol..... 2727

Legal actions taken against contractors who submit grossly inflated claims..... 2731

Does the Navy fail to enforce the law?..... 2732

Litton overpaid by \$7.5 million on new submarine..... 2732

Possible fraud in Litton 680 submarine claims case..... 2733

Puffing versus fraud: Imprecision in the claims process..... 2734

Fraud report on the Litton case..... 2734

Navy will take action against Litton after recommendations made..... 2735

Navy fraud report never filed..... 2735

Litton case unique—No other fraud cases under investigation. Lockheed shipbuilding—Withhold information and overstate claim..... 2736

Navy's tentative settlement with Lockheed inflated by a factor of seven—Costs the taxpayer interest for 1½ years on \$40 million..... 2737

Litton must repay Navy for overpayments on the LHA contract..... 2741

Navy resumes progress payments to Litton, although Litton still owes Navy millions..... 2742

LHA target total cost—\$795.265 million..... 2743

Apply past performance record to future procurement decisions..... 2743

Should-cost study of Grumman operations because of rising cost of the F-14..... 2744

Grumman should-cost study costs Navy about \$400,000..... 2745

No final report on a \$400,000 study..... 2745

GAO report on kickback at Ingalls shipbuilding—Navy responds..... 2751

Navy should have been aware of irregularities at Ingalls..... 2752

DOD reacts to the subcommittee study on competitive procurement..... 2754

DOD should move to greater use of competition..... 2756

More on build and charter—Role of the Committee to Reelect and congressional security..... 2806

Build and charter—Back door financing..... 2807

Unleash Gordon Rule—Navy lags behind in using should-cost..... 2807

DOD reaction to A. E. Fitzgerald's view that should-cost technology has been diluted..... 2808

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# THE ACQUISITION OF WEAPONS SYSTEMS

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WEDNESDAY, NOVEMBER 14, 1973

CONGRESS OF THE UNITED STATES,  
SUBCOMMITTEE ON PRIORITIES AND  
ECONOMY IN GOVERNMENT OF THE  
JOINT ECONOMIC COMMITTEE,  
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 10:05 a.m., in room S-407, the Capitol, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senators Proxmire and Javits.

Also present: Richard F. Kaufman, professional staff member; Michael J. Runde, administrative assistant; and Walter B. Laessig, minority counsel.

## OPENING STATEMENT OF CHAIRMAN PROXMIRE

Chairman PROXMIRE. The subcommittee will come to order.

Nearly 1 year ago the Subcommittee on Priorities and Economy in Government received information concerning improprieties in the awarding of subcontracts by the Ingalls Shipbuilding Division of Litton Industries, Inc.

Approximately 50 percent of the dollar amount of prime contracts awarded annually by the Department of Defense are in turn subcontracted out to others by the Pentagon's prime contractors.

### \$18.5 BILLION TO SUBCONTRACTORS—WASTE AND KICKBACKS APPARENT

Last year \$37 billion in contracts was awarded by the Pentagon. About half of this amount—\$18.5 billion—has or will find its way into the hands of subcontractors.

Obviously, the methods used by defense contractors to subcontract out part of its work can significantly influence the final costs to the Government. For this reason the subcommittee decided to gather additional information about Litton's subcontracts.

The facts learned by the subcommittee staff were most disturbing. Evidence was uncovered of highly irregular relationships between officials and employees of Litton and subcontractors of Litton.

Clearly, large sums of money were being wasted on military projects. There was also evidence that kickbacks may have been paid on one or more of the subcontracts.

Under the law it is a criminal offense for anyone to pay or receive a kickback on a subcontract of a Government procurement. The law also authorizes the General Accounting Office to investigate whether kickbacks have been made and to recover any sums that have been paid as kickbacks.

I therefore requested the Comptroller General to investigate the allegations I had received and the facts we had obtained were turned over to him for his use.

In my letter to the Comptroller General I stated that I was not making any allegations of wrongdoing by Litton or any individual at that time and I expressed the hope that the inquiry would be handled in a confidential manner to avoid injuring innocent persons.

#### GAO REPORT ON LITTON SUBCONTRACTING PRACTICES

GAO's investigation is now complete and an official report has been made to me. The facts contained in the Comptroller General's report disclose the most appalling and improper behavior by officials and employees of Litton and by its subcontractors.

In addition to gross improprieties and conflicts of interest, the results of the investigation raise the clear possibility that criminal violations have occurred.

The scandalous situations disclosed by the investigation must be underlined with the fact that the cases investigated were selected at random from a larger number of suspicious transactions referred for scrutiny.

The Comptroller General's findings have been referred to the Justice Department for investigation of possible criminal violations. I understand that the transactions identified but not investigated by GAO will also be referred to the Department of Justice.

Although the problems of subcontracting—viewed from a broad perspective to include questions of efficiency as well as propriety and legality—are important, they represent only a portion of the issues to be covered in today's testimony by Comptroller General Staats.

The subcommittee has a long standing interest in the overall costs of defense procurement and of ways for Congress and the public to be provided with timely and accurate information about the costs of major weapons.

We have been concerned with the rising costs of weapons and equipment and the failure of the Pentagon and its contractors to take adequate steps to control costs. The committee has advocated the "should-cost method of identifying what can only be described as the fat in defense contracts.

These and other topics will be the subject of today's discussion.

Elmer Staats, the Comptroller General, and Tom Morris, Assistant Comptroller General, are our first two witnesses this morning. I want to congratulate both of you and your staff for the outstanding job in the Litton investigation. I have had a chance to read your prepared statement and it, too, is excellent.

I do hope you can summarize it for us so that we can get right into the questions.

STATEMENT OF HON. ELMER B. STAATS, COMPTROLLER GENERAL OF THE UNITED STATES, ACCOMPANIED BY THOMAS D. MORRIS, ASSISTANT COMPTROLLER GENERAL; RICHARD W. GUTMANN, DIRECTOR, PROCUREMENT AND SYSTEMS ACQUISITION DIVISION (PSAD); JAMES H. HAMMOND, DEPUTY DIRECTOR (PSAD); PAUL SHNITZER, ASSOCIATE GENERAL COUNSEL, OFFICE OF THE GENERAL COUNSEL; FRANCIS MARVIN DOYAL, SUPERVISORY AUDITOR, NEW ORLEANS, LA.; AND GEORGE WOODITCH, SUPERVISORY AUDITOR (PSAD)

Mr. STAATS. Thank you, Mr. Chairman.

As we have indicated, we are covering several matters of current interest to us, and I believe to the subcommittee this morning.

The first of those has to do with the interest of our office and the Office of Federal Procurement Policy Legislation.

Chairman PROXMIRE. For the record, would you identify your associates?

Mr. STAATS. I would be delighted.

Mr. Tom Morris, Assistant Comptroller General; Mr. Paul Shnitzer, Associate General Counsel of the GAO; Mr. Richard Gutmann, who is head of the Procurement and Systems Acquisition Division; and Mr. James Hammond, who is the Deputy Director of that Division.

There will be others who will be testifying, we will identify them as they are called upon.

Mr. Chairman, in view of your subcommittee's interest for many years in improving the procurement process in the Federal Government and industry, we would like to bring to your attention the status of the proposed legislation to carry out the recommendation of the Procurement Commission known as the Commission on Government Procurement.

COMMISSION ON GOVERNMENT PROCUREMENT DETERMINES NEED FOR  
STRONGER EXECUTIVE LEADERSHIP

As you know, there was a 3-year effort made up of four Members of Congress, myself and five appointees of the President. This was the first and most thorough-going review of the Federal procurement policy and procedures ever made by the Federal Government. Both at the grassroots and at the agency level there was no disagreement at all as to the need to have a stronger central point of leadership in the Government to deal with those expenditures which, as you know, ran in 1972, to \$57.5 billion, and are continuing to run at about this level.

We think that there is a literal nightmare of conflicting and confusing regulations or statutes as to procedures, which can do nothing more than cost the Federal Government a great deal of money by virtue of not having a stronger point of leadership in the executive branch to deal with these problems.

We had 16 study groups of the Procurement Commission. Thirteen of these identified the need for stronger leadership if we are going to resolve the issues that we have.

Now, we think that there are opportunities for savings here which could be very substantial. There is no disagreement anywhere on the need for stronger leadership.

The only issue before the Congress today is the need for legislation. And we think that without legislation the executive branch is not going to face up to this problem in a realistic way.

I mention this as kind of an introduction to our statement today, because many of the problems that you have been concerned with and that we have been concerned with we think can only be resolved by stronger leadership from the central point in the executive branch, even on legislation, because there is no single committee in the Congress that deals with the legislative problems in this field. And the initiative, therefore, has to come from the executive branch to put before the Congress to carry out the legislative improvements which are needed.

#### MORE INFORMATION ON PROCUREMENT BEFORE SENATE GOVERNMENT OPERATIONS COMMITTEE

I mention this, as I say, as a kind of background, introduction, because I know of your personal interest in the area of achieving greater economy and greater public confidence in the area of Government procurement. It is not only the Government outlays involved here that as we see it are important, but the way the Government buys from the private sector as the largest single buyer that has the largest single impact on the private economy of any other force in the entire economy.

Now, we will be appearing tomorrow before the Senate Government Operations Committee, and we are going to lay this out in greater detail. But I felt that it was important to bring it up here and hope that it will have the support and interest of this committee.

#### NAVY BUILD AND CHARTER PROGRAM

The second item I want to refer to, of my statement, has to do with the Navy's build and charter program.

The Navy entered into a long-term, 20-year, leasing arrangement on June 20, 1972, by having the joint venture of Marine Transport Lines, Inc., Citicorp Leasing, Inc., and Salomon Bros. obtain the funds to finance the construction of nine tankers with Navy's guarantee that it would lease them. Four tankers are being built by Todd Shipyards Corp. and five are being built by Bath Iron Works Corp.

GAO made the review to determine—whether the Navy's action was the more economical method to meet its needs; whether or not the Congress had an opportunity to consider the wisdom of the transaction before the formal commitment to spend future funds; and whether review and approval by the Congress should be required for future transactions of this type.

Prior to formalizing the leasing arrangement, the proposed financiers asked us to rule on the legality of using operation and maintenance funds to pay the lease costs.

That is how we got into this consideration, because they would not advance the money unless they had assurance from a legal standpoint as to the Government's commitment to go through with it.

Our decision was that use of operation and maintenance funds instead of procurement funds was not illegal since title to the ships would never pass to the Government and therefore did not result in the purchase of an asset. Now, this may be a fine distinction, but it was, nevertheless, the only conclusion that we could reach.

In furnishing a copy of this decision to the Secretary of Defense we suggested, that in view of the magnitude of the program, it would be desirable to inform the House and Senate Committees on Armed Services and Appropriations of the plans before forward.

They did not do this in writing, but we understood that they did do this informally.

#### WHICH COSTS MORE—LEASE OR PURCHASE?

According to the latest available estimate, the total lease costs will be approximately \$313 million over the 20-year lease period beginning in fiscal year 1975. The cost to purchase the tankers, less the residual value, would have been \$136 million. However, as you know, whether leasing is more economical than purchasing depends on the discount rate used to convert future dollars into today's value. The Navy believes that the appropriate discount rate is 10 percent as prescribed in DOD instructions and OMB circular A-94. But OMB circular A-94 does not really apply to cases of this type. Circular A-76, however, does. Under A-76 criteria the decision would have been evaluated using the yield on long-term Treasury obligations which was about 6 percent at the time of the decision to lease.

Now, just to show you the contrast here, and the difference in the cost to the Government, it would cost the Government \$178.1 million more to lease rather than purchase the ships if discounting were disregarded. By using the 6-percent rate which would have been appropriate at the time under A-76 criteria, it would cost \$29.6 million more to lease than to purchase. By using the 10-percent discount rate presented in OMB circular A-94, it is estimated to cost \$10.4 million less to lease than to purchase the tankers.

We have presented a chart, attachment I, attached to the prepared statement to show graphically what the effect of these different approaches represent by way of cost.

As a result of our review, we recommended that the Secretary of Defense revise DOD instructions to provide for application of the guidelines set forth in circular A-76, in evaluating long-term leasing of assets such as ships. We also recommended that to improve congressional awareness of similar programs the Secretary of Defense should assist the Congress by:

#### CONCLUSIONS AND SUGGESTIONS FOR LEGISLATION

Providing it with information on the proposed method of acquisition; providing detailed cost analysis showing full impact on future budgets; and requiring analyses of long-term leasing arrangements to be made on a total-cost-to-the-Government basis.

In effect, what was involved here, Mr. Chairman, was backdoor financing in a way which ended up costing the Government substantially more money than it would have if we had gone on an outright purchase basis.

We also suggested that, since the Navy's build-and-charter program is similar to Government programs for leasing buildings, the Congress may wish to consider the need for legislation similar to Public Law 92-313. This law requires congressional approval of all building leases costing more than \$500,000 a year.

We have been advised that the Navy is currently considering a similar arrangement for acquiring the use of two dry-cargo-type ships. Because the build-and-charter program can be considered as setting a precedent, legislation could be an effective tool to insure congressional review of future long-term leasing programs of this type, and it is for this reason that we bring it to your attention this morning as a part of our statement.

#### SUGGESTED CHANGES IN SELECTED ACQUISITION REPORTS

Now, the third item has to do with the reports made to the Congress which have been known as SAR's or selected acquisition reports. In the prepared statement we say that, "The selected acquisition reports do provide summary data for the congressional committees and Congressmen faced with critical decisions on major weapons acquisitions. We believe, however, that there are a number of changes that can and should be made to further improve the utility of these reports," and we have summarized these here. I don't think that it is necessary for us to repeat those, unless you have a question. But this has developed, as we see it, Mr. Chairman, into one of the most important forms of disclosure and of information to the Congress for a great many years on its oversight responsibility of acquisition of weapons systems.

In the prepared statement I point out that, "DOD has no formal process for deciding whether a major system should be included in the SAR system. We were informed that systems are selected for the SAR system on the basis of recommendations from the services or OSD and/or on the basis of interest in a system by the Congress or GAO."

"Establishing and maintaining firm baselines for major acquisitions must be mandatory in order to improve the SAR as a key information report."

As you know, we submitted to the Congress yesterday, and I believe that you released, the report on the financial status of major weapons systems. It is very important to have this baseline established clearly.

At the outset of any program, a planning estimate is established and periodically changes as the program progresses. The initial planning estimates could be reported as ranges of dollars and should remain on the SAR for tracking.

A similar approach could be labeled as "initial" and stated as ranges of probable cost until the development contract was awarded. Subsequently, the development estimate should remain static.

At this point, Mr. Chairman, it is much more important, as we see it, for the Congress to have the ranges of the estimates and the variables

which may affect that range, so that Congress can make a judgment of action that it may be called upon to take either in appropriations or authorizations.

Adding a production estimate to SAR's should also be considered. This would be "initial" until the production phase begins, and would become static once the production contract is awarded.

The SAR's should be submitted to the Congress and management officials in the Department of Defense on a more timely basis. As you know, there is a considerable lag now, roughly 4 months, from the date until the time Congress sees it through these reports.

Because of what appear to be an inordinate number of review levels both within the services and the Office of the Secretary of Defense, SAR's are now being issued from 3 to 4 months after the close of the period covered. In our opinion, this delay is not necessary and could, on occasion, result in a failure to take appropriate actions at an early date.

All program costs should be included on the SAR's beginning with the initial issuance of a SAR for a particular program. At the present time, SAR's for weapons programs in the development state often do not include an estimate of the total production costs. We believe that the Congress and DOD management are limited in their ability to make intelligent decisions, even during the development phase, if they do not have some estimate of the total program cost. In addition, such limitation of cost reporting can result in some programs not being reported on the SAR's for substantial periods of time because they do not meet cost criteria.

Also, at the present time, nuclear warhead costs are not included in the total program costs because they are funded by the Atomic Energy Commission. At our urging, such costs have been included as "footnote" item on the SAR's, but can be overlooked by a reader very easily. Since these costs can be substantial, we believe they should be included in the total program cost estimates as shown on the SAR.

Our letter of October 30, 1973, on this subject to the chairman, Committee on Armed Services, House of Representatives, is attachment II to my prepared statement.

Now, I have already referred to the financial status reports on those investigated acquisitions.

Our latest report on the financial status of selected major weapon systems has just been issued. This report details the cost changes of \$2.7 billion reported on 45 major weapon systems between December 31, 1972, and June 30, 1973. The total estimated costs amounted to \$122.4 billion on December 31, 1972, and \$125.1 billion on June 30, 1973. The net increase of \$2.7 billion is made up of decreases in development estimates totaling \$0.2 billion, quantity decreases totaling \$0.1 billion and cost increases relating to other factors totaling \$3.0 billion.

In the future, we plan to continue submitting financial status reports on major acquisitions on a semiannual basis. The report on the status of December 31 will be issued in May of each year and the June 30 status report will be issued in November of each year, until, of course, we can get some speeding up in the process in the Defense Department, in which case they will come up earlier.

Now, I would like to turn to the should-cost studies sector in my prepared statement. This matter has been of great interest to this committee.

RESULTS OF SELECTED SHOULD-COST STUDIES—NAVY FALLS BEHIND ARMY  
AND AIR FORCE

In testimony before this subcommittee last December, we discussed the results of our assessment of selected should-cost studies of contractors' operations which were performed by the Army. Since that time we have issued reports on our assessments of should-cost studies performed by the Navy and the Air Force. We have also completed certain followup work on the Army and Navy studies which you requested in your July 24, 1973, letter. I will briefly summarize the results of this work today and the report on this work will be issued to you in the very near future.

We believe that, as a result of the interest shown by this subcommittee in the should-cost approach, the military departments have taken a more active role in reviewing the operations of Government contractors. The Navy, however, has fallen behind the Army and the Air Force in its use of the should-cost approach. For example, only 3 of the more than 50 should-cost studies conducted to date involved Navy procurements. And none are now in process, whereas the Army and the Air Force have some 17 of the studies in process or planned.

Although many improvements recommended by the should-cost teams cannot be quantified, if these improvements are adequately implemented by the contractors, the benefits could be substantial. While progress has been made, much remains to be done to make the results of the should-cost studies even more productive. Our reports contain a number of recommendations designed to encourage improvements in the military services' use of this approach in the future.

The Army advised us that it fully concurred in the contents of our October 30, 1972, report, and that it had initiated a number of specific actions to assure full implementation of our recommendations. As part of our followup work, we inquired into the progress made by the six Army contractors who agreed to work toward certain management improvement goals. We found that the contractors had made improvements in most of the areas identified by the Army. For example, reductions were made in manufacturing, assembly and fabrication labor hours, and in indirect costs. Also, improvements were made in production controls and make-or-buy procedures.

Following completion of the Air Force studies which are discussed in our July 31, 1973, report, the Air Force issued guidance for use on future should-cost studies which, if properly implemented, should correct most of the deficiencies we found.

NAVY—ONLY TWO SHOULD-COST STUDIES SINCE 1967—MARK 48 TORPEDO  
IS ONE

Since 1967, when the first should-cost study was made on the TF-30 jet engine procurement, the Navy has made only two others. These concerned the operations of two contractors which were competing for production of the Mark 48 torpedo. Our assessment which is dis-

cussed in our May 15, 1973, report was directed primarily to the study of the operations of the contractor which was ultimately awarded the first production contract in July 1971.

Although our followup work indicates that the Mark 48 contractor has made improvements in his operations in each of the areas in which the should-cost team considered in need of attention, we could not quantify savings directly related to each of the should-cost recommendations. We found that the Mark 48 torpedo costs and prices have continued to decline since the initial proposals for the first production contract. Also, the contractor is currently projecting a cost underrun of about \$7.7 million on the first production contract.

The Navy has recently issued a memorandum intended to provide guidance to its procurement activities with respect to making should-cost studies. It may be useful to discuss the revised policy with Navy representatives when they appear before the committee, which I understand is on your schedule.

Based on our assessments of the should-cost studies that have been performed by the military services, it seems clear that there is great potential for the Government to benefit from the proper application of should-cost concepts. The criteria for selecting procurements for study and decisions regarding the scope and timing of the studies have been left largely to the individual services to determine. In light of the considerable experience gained by the military services in conducting should-cost studies in recent years, we believe the Department of Defense should take a more active role in establishing the criteria as to when should-cost studies should be made and in monitoring the effectiveness of the studies.

I would like to refer briefly, Mr. Chairman, to the subject of architect engineering services, which has also been discussed before this committee on prior hearings. We have, I think, discussed this with you in several contexts. But the most recent development on this since our last hearing is legislation enacted last year, and a report of the Commission on Government Procurement.

COMMISSION ON GOVERNMENT PROCUREMENT SUGGESTIONS TO IMPROVE  
PURCHASE OF ARCHITECT ENGINEERING SERVICES

The Commission recommended that:

The basis for procurement of A/E services, so far as practicable, should be competitive negotiations, taking into account the technical competence of the proposers, the proposed concept of the end product, and the estimated cost of the project, including fee.

Life-cycle cost estimates should be included in A/E contracts on projects estimated to cost in excess of \$500,000. This is not being done today.

Consideration should be given to reimbursing A/E's for costs incurred in submitting proposals where unusual design problems are involved and substantial work is needed to submit proposals. This is the same procedure which is followed on R. & D. contracts today, but is not done in this field.

In light of the Commission's findings and recommendations and in light of recent press coverage concerning A/E contracting at the State and local level—and I guess Maryland is the one that has gotten most

of the attention—we are undertaking a review of the procedures followed by Federal agencies in the procurement of A/E services.

Now, I turn to the subject referred to in your opening statement, Mr. Chairman.

#### INGALLS SHIPBUILDING OF LITTON—POSSIBLE ILLEGAL OR IMPROPER ACTIVITIES

As you know, there had been allegations that officers and employees of Litton Industries, Ingalls Shipbuilding Division, Pascagoula, Miss., engaged in illegal or improper activities including the taking of fees and kickbacks from subcontractors.

Your January 2, 1973, letter to us indicated that there were allegations of improprieties and irregularities in both the purchase and sale of supplies and equipment at Ingalls. As agreed with your office we reviewed procurements from five Ingalls subcontractors where there were allegations that sound procurement practices were not followed.

In summary we found:

An award to other than the low bidder although the low bidder appeared to meet the procurement requirements.

Preaward activities may have been conducted in a manner to insure awards to certain subcontractors.

Two Ingalls' employees requested, received, and certified the receipt of services from a firm they had established.

A questionable award to a subcontractor by Ingalls' procurement officials who subsequently became officials of that subcontractor.

Ingalls made 22 awards in the amount of \$6.4 million to a subcontractor known to be experiencing financial problems. These matters are covered in detail in our report submitted to you on October 23, 1973.

As I stated earlier, we agreed with your office to limit the number of transactions examined so that they could be studied in some depth to establish a chronology of events and facts surrounding the relationship between the Ingalls Shipbuilding Division and its subcontractors. Therefore, we did not evaluate Ingalls' procurement system but instead developed the specifics of the case studies shown in our report. Because of the restricted scope of our review, we do not believe any overall conclusions can be drawn as to the adequacy of Ingalls' subcontracting practices.

Although our review shows that questionable procurement practices occurred, we wish to emphasize that the factual data we were able to obtain did not demonstrate that there were payments of fees or kickbacks. We therefore did not have a basis to take any recovery actions under the Anti-kickback Act (41 U.S.C. 51). This act provides for the agencies or GAO to direct recoveries of kickbacks on Government contracts. There were some indications of possible violations of Federal criminal law, therefore, the report was referred to the Department of Justice to determine what further actions may be appropriate, as is our normal practice.

#### MORE ATTENTION SHOULD BE FOCUSED ON PRIME CONTRACTORS' PROCUREMENT PRACTICES

We are concerned, however, about the possibility of increased costs to the Government because of questionable procurement practices by

prime contractors. Therefore, separate and apart from this report we brought these matters to the attention of the Department of Defense pointing out the need for the Department to give further attention to the adequacy of contractors' procurement practices. Also, we recommended that the Department undertake a review of the agencies surveillance procedures to determine whether they are adequate to disclose problems of this nature and whether additional surveillance procedures over contractors' procurement practices are required. Further, we plan to cover this aspect in our broad review of prime contractors' procurement activities, which as you have already indicated, is very important, because about half of the Government's prime contract dollars reach subcontractors through prime contractor purchasing systems. This is referred to in my prepared statement. I do not think it is necessary for me to take the time to read that, Mr. Chairman. It fits in with the preceding point that was just made.

This concludes our formal statement on those topics. We are doing, as you know, a great deal of work in other aspects of Federal procurement, but we have tried to highlight for you here today some of the more important matters and some matters in which you have expressed an interest.

Chairman PROXMIRE. Thank you very much, Mr. Staats. This is a superlative statement. I very much appreciate it. And without objection, the prepared statement and attachments will also be included in the record at this point.

[The prepared statement and attachments of Mr. Staats follow:]

#### PREPARED STATEMENT OF HON. ELMER B. STAATS

Mr. Chairman and members of the subcommittee, I am pleased to appear before this Subcommittee today. My statement will cover some of our recent work on Federal procurement.

#### OFFICE OF FEDERAL PROCUREMENT POLICY

In view of your Subcommittee's interest for many years in improving the procurement process in the Federal Government and industry, we would like to first bring you up to date on the status of proposed legislation to carry out the recommendation of the Commission on Government Procurement to establish an Office of Federal Procurement Policy.

As you know, a three year effort was recently completed by the Commission, created by the Congress, of which I was a member, devoted entirely to a study of Government Procurement. Through this effort, we found a widespread consensus at both the grass-roots and highest levels in Government and industry or the need for a focal point in the executive branch to exercise leadership in (1) formulating and coordinating basic procurement policies and (2) overseeing their implementation in a procurement process which now involves the expenditure of more than \$50 billion annually. It was found also that a central point of leadership was needed to work with the Congress in modernizing and consolidating the present fragmented statutory base and to develop a more uniform regulatory system among the many Federal agencies with extensive procurement activities.

The Commission envisioned an Office of Federal Procurement Policy placed at a high level in Government. The Office would act as an impartial spokesman in procurement matters before the Congress.

It is our position that legislation is vital in order to provide a congressional mandate for action and to provide the focal point of procurement policy leadership with the stature, authority and caliber of personnel necessary to get the job done. Mr. Chairman, we will be testifying tomorrow on the need for this legislation before Senator Chiles' Ad Hoc Subcommittee on Federal Procurement. Many of the problems we will be discussing today could be ameliorated or avoided if a strong point of leadership had existed in the Executive Office of the President. I hope the legislation will have the support of this Committee.

## BUILD AND CHARTER PROGRAM

The Navy entered into a long-term (20-year) leasing arrangement on June 20, 1972, by having the joint venture of Marine Transport Lines, Inc.; Citicorp Leasing, Inc.; and Salomon Brothers obtain the funds to finance the construction of nine tankers with Navy's guarantee that it would lease them. Four tankers are being built by Todd Shipyards Corporation and five are being built by Bath Iron Works Corporation.

GAO made the review to determine—

Whether the Navy's action was the more economical method to meet its needs;

Whether or not the Congress had an opportunity to consider the wisdom of the transaction before the formal commitment to spend future funds; and

Whether review and approval by the Congress should be required for future transactions of this type.

Prior to formalizing the leasing arrangement, the proposed financiers asked us to rule on the legality of using operation and maintenance funds to pay the lease costs. Our decision was that use of operation and maintenance funds instead of procurement funds was not illegal since title to the ships would never pass to the Government and therefore did not result in the purchase of an asset.

In furnishing a copy of this decision to the Secretary of Defense we suggested, that in view of the magnitude of the program, it would be desirable to inform the House and Senate Committees on Armed Services and Appropriations of the plans before going forward. The Navy told us that they advised the Committees informally.

According to the latest available estimate, the total lease costs will be approximately \$313 million over the 20-year lease period beginning in fiscal year 1975. The cost to purchase the tankers, less the residual value, would have been \$136 million. However, as you know, whether leasing is more economical than purchasing depends on the discount rate used to convert future dollars into today's value. The Navy believes that the appropriate discount rate is 10 percent as prescribed in DOD Instructions and OMB Circular A-94. Circular A-94 prescribes the discount rate for evaluating Government decisions concerning the initiation, renewal, or expansion of programs or projects. However, A-94 states that its provisions do not apply to the evaluation of Government decisions concerning the acquisition of commercial-type services and that guidance for making such decisions is contained in Circular A-76. OMB Circular A-76 criteria for valuing money is the average yield on long-term Department of the Treasury obligations. This rate, at the time the transaction was entered into, was about 6 percent.

Let me contrast the difference in cost to the Government using the criteria set forth in the two OMB circulars. It would cost the Government \$178.1 million *more* to lease rather than purchase the ships if discounting were disregarded. By using the 6 percent rate which would have been appropriate at the time under A-76 criteria, it would cost \$29.6 million *more* to lease than to purchase. By using the 10 percent discount rate presented in OMB Circular A-94, it is estimated to cost \$10.4 million *less* to lease than to purchase the tankers. These data are graphically presented at Attachment I.

As a result of our review, we recommended that the Secretary of Defense revise DOD Instructions to provide for application of the guidelines set forth in Circular A-76, in evaluating long-term leasing of assets such as ships. We also recommended that to improve congressional awareness of similar programs the Secretary of Defense should assist the Congress by—

Providing it with information on the proposed method of acquisition, Providing detailed cost analysis showing full impact on future budgets, and

Requiring analyses of long-term leasing arrangements to be made on a total-cost-to-the-Government basis.

We also suggested that, since the Navy's Build and Charter program is similar to Government programs for leasing buildings, the Congress may wish to consider the need for legislation similar to Public Law 92-313. This law requires congressional approval of all building leases costing more than \$500,000 a year.

We have been advised that the Navy is currently considering a similar arrangement for acquiring the use of two dry cargo-type ships. Because the Build and Charter program can be considered as setting a precedent, legislation could be an effective tool to insure congressional review of future long-term leasing programs.

## SELECTED ACQUISITION REPORTS

In February 1968, the Department of Defense established the Selected Acquisition Report (SAR) requirement. Before the system was introduced, there were no summary recurring reports on major acquisitions which provided a comparison of current cost, schedule, and performance data with prior estimates. DOD instructions provide that SARs are required for all programs designated as major by the Secretary of Defense and will usually be those programs which require a total of \$50 million for development and testing or \$200 million for procurement.

The selected acquisition reports do provide summary data for the congressional committees and congressmen faced with critical decisions on major weapons acquisitions. We believe, however, that there are a number of changes that can and should be made to further improve the utility of these reports. These are:

More precise criteria should be established for including major acquisitions for SAR reporting. DOD instructions provide that SARs are required for all programs designated as major by the Secretary of Defense and will usually be those programs which require a total of \$50 million for RDT&E or \$200 million for procurement. Other systems not qualifying under these dollar guidelines may be designated for SAR coverage by the Secretary.

Though criteria for SAR reporting should include dollar limitations, the above dollar criteria by themselves may preclude systems critical to the national defense from being included or even from being considered for SAR reporting solely on the basis of minimum dollar limitations. Thus the urgency of need should also be included in the criteria for SAR reporting. In addition, factors should be included in the criteria to specify when in the acquisition process systems should be added or deleted.

DOD has no formal process for deciding whether a major system should be included in the SAR system. We were informed that systems are selected for the SAR system on the basis of recommendations from the services or OSD and/or on the basis of interest in a system by the Congress or GAO.

Establishing and maintaining firm baselines for major acquisitions must be mandatory in order to improve the SAR as a key information report. To measure program progress, management must have a baseline. At the outset of any program, a planning estimate is established and periodically changes as the program progresses. The initial planning estimates could be reported as ranges of dollars and should remain on the SAR for tracking purposes.

A similar approach could be taken with the development estimate. It could be labeled as "initial" and stated as ranges of probable cost until the development contract was awarded. Subsequently, the development estimate should remain static.

Adding a production estimate to SARs should also be considered. This would be "initial" until the production phase begins, and would become static once the production contract is awarded.

The SARs should be submitted to the Congress and management officials in the Department of Defense on a more timely basis in order to facilitate intelligent decision-making. Because of what appear to be an inordinate number of review levels both within the services and the Office of the Secretary of Defense, SARs are now being issued from 3-4 months after the close of the period covered. In our opinion, this delay is not necessary and could, on occasion, result in a failure to take appropriate actions at an early date.

All program costs should be included on the SARs beginning with the initial issuance of a SAR for a particular program. At the present time, SARs for weapons programs in the development state often do not include an estimate of the total production costs. We believe that the Congress and DOD management are limited in their ability to make intelligent decisions, even during the development phase, if they do not have some estimate of the total program cost. In addition, such limitation of cost reporting can result in some programs not being reported on the SARs for substantial periods of time because they do not meet cost criteria.

Also, at the present time, nuclear warhead costs are not included in the total program costs because they are funded by the Atomic Energy Commission. At our urging, such costs have been included as a "footnote" item on the SARs, but can be overlooked by a reader. Since these costs can be substantial, we believe they should be included in the total program cost estimates as shown on the SAR.

Our letter of October 30, 1973, on this subject to the Chairman, Committee on Armed Services, House of Representatives is Attachment II to my statement.

## FINANCIAL STATUS REPORTS ON SELECTED ACQUISITIONS

Our latest report on the financial status of selected major weapon systems has just been issued. This report details the cost changes of \$2.7 billion reported on 45 major weapon systems between December 31, 1972, and June 30, 1973. The total estimated costs amounted to \$122.4 billion on December 31, 1972, and \$125.1 billion on June 30, 1973. The net increase of \$2.7 billion is made up of decreases in development estimates totaling \$.2 billion, quantity decreases totaling \$.1 billion and cost increases relating to other factors totaling \$3.0 billion.

In the future, we plan to continue submitting financial status reports on major acquisitions on a semi-annual basis. The report on the status as of December 31, will be issued in May of each year and the June 30 status report will be issued in November of each year.

Evaluations of selected management functions will be made and reports issued as the evaluations are completed in lieu of combining an assessment of management actions and financial status in a single annual report.

The schedule and performance data will be reported in our staff studies on individual systems, as in the past.

## SHOULD-COST STUDIES

In testimony before this subcommittee last December, we discussed the results of our assessment of selected should-cost studies of contractors' operations which were performed by the Army. Since that time we have issued reports on our assessments of should-cost studies performed by the Navy and the Air Force. We have also completed certain follow-up work on the Army and Navy studies which you requested in your July 24, 1973, letter. I will briefly summarize the results of this work today and the report on this work will be issued to you in the very near future.

We believe that, as a result of the interest shown by this subcommittee in the should-cost approach, the military departments have taken a more active role in reviewing the operations of Government contractors. The Navy, however, has fallen behind the Army and the Air Force in its use of the should-cost approach. For example, only three of the more than fifty should-cost studies conducted to date involved Navy procurements.

Although many improvements recommended by the should-cost teams cannot be quantified, if these improvements are adequately implemented by the contractors, the benefits could be substantial. While progress has been made, much remains to be done to make the results of the should-cost studies even more productive. Our reports contain a number of recommendations designed to encourage improvements in the military services' use of this approach in the future.

The Army advised us that it fully concurred in the contents of our October 30, 1972, report, and that it had initiated a number of specific actions to assure full implementation of our recommendations. As part of our follow-up work, we inquired into the progress made by the six Army contractors who agreed to work toward certain management improvement goals. We found that the contractors had made improvements in most of the areas identified by the Army. For example, reductions were made in manufacturing, assembly and fabrication labor hours, and in indirect costs. Also, improvements were made in production controls and make-or-buy procedures.

Following completion of the Air Force studies which are discussed in our July 31, 1973, report, the Air Force issued guidance for use on future should-cost studies which, if properly implemented, should correct most of the deficiencies we found. Actions have also been promised by the Air Force with respect to the other matters discussed in our report.

Since 1967, when the first should-cost study was made on the TF-30 jet engine procurement, the Navy has made only two others. These concerned the operations of two contractors which were competing for production of the Mark 48 torpedo. Our assessment which is discussed in our May 15, 1973 report, was directed primarily to the study of the operations of the contractor which was ultimately awarded the first production contract in July 1971.

Although our follow-up work indicates that the Mark 48 contractor has made improvements in his operations in each of the areas in which the should-cost team considered in need of attention, we could not quantify savings directly related to each of the should-cost recommendations. We found that the Mark 48

torpedo costs and prices have continued to decline since the initial proposals for the first production contract. Also, the contractor is currently projecting a cost overrun of about \$7.7 million on the first production contract.

The Navy has recently issued a memorandum intended to provide guidance to its procurement activities with respect to making should-cost studies. We do not believe the policy statement will encourage the Navy's increased use of should-cost studies. It may be useful to discuss the revised policy with Navy representatives when they appear before the Committee.

Based on our assessments of the should-cost studies that have been performed by the military services, it seems clear that there is great potential for the Government to benefit from the proper application of should-cost concepts. The criteria for selecting procurements for study and decisions regarding the scope and timing of the studies have been left largely to the individual services to determine. In light of the considerable experience gained by the military services in conducting should-cost studies in recent years, we believe the Department of Defense should take a more active role in establishing the criteria as to when should-cost studies should be made and in monitoring the effectiveness of the studies.

#### ARCHITECT AND ENGINEERING SERVICES (A. & E.)

In previous appearances before this Committee, we discussed the Government's contracting for A/E services. Since that time legislation on A/E services has been enacted and the Commission on Government Procurement studied the subject. The Commission recommended that:

The basis for procurement of A/E services, so far as practicable, should be competitive negotiations, taking into account the technical competence of the proposers, the proposed concept of the end product, and the estimated cost of the project, including fee.

Life-cycle cost estimates should be included in A/E contracts on projects estimated to cost in excess of \$500,000.

Consideration should be given to reimbursing A/Es for costs incurred in submitting proposals where unusual design problems are involved and substantial work is needed to submit proposals.

In light of the Commission's findings and recommendations and in light of recent press coverage concerning A/E contracting at the state and local level, we are undertaking a review of the procedures followed by Federal Agencies in the procurement of A/E services.

#### SELECTED SUBCONTRACTING ACTIVITIES AT LITTON'S PASCAGOULA SHIPYARD

As you know, there had been allegations that officers and employees of Litton Industries, Ingalls Shipbuilding Division, Pascagoula, Mississippi, engaged in illegal or improper activities including the taking of fees and kickbacks from subcontractors.

Your January 2, 1973, letter to us indicated that there were allegations of improprieties and irregularities in both the purchase and sale of supplies and equipment at Ingalls. As agreed with your office we reviewed procurements from five Ingalls' subcontractors where there were allegations that sound procurement practices were not followed.

In summary, we found:

an award to other than the low bidder although the low bidder appeared to meet the procurement requirements;

preaward activities may have been conducted in a manner to insure awards to certain subcontractors;

two Ingalls' employees requested, received, and certified the receipt of services from a firm they had established;

a questionable award to a subcontractor by Ingalls' procurement officials who subsequently became officials of that subcontractor; and

Ingalls made 22 awards in the amount of \$6.4 million to a subcontractor known to be experiencing financial problems.

These matters are covered in detail in our report submitted to you on October 23, 1973.

As I stated earlier, we agreed with your office to limit the number of transactions examined so that they could be studies in some depth to establish a chronology of events and facts surrounding the relationship between the Ingalls Shipbuilding Division and its subcontractors. Therefore, we did not evaluate Ingalls' procurement system but instead developed the specifics of the case studies

shown in our report. Because of the restricted scope of our review, we do not believe any overall conclusions can be drawn as to the adequacy of Ingalls' sub-contracting practices.

Although our review shows that questionable procurement practices occurred, we wish to emphasize that the factual data we were able to obtain did not demonstrate that there were payments of fees or kickbacks. We therefore did not have a basis to take any recovery actions under the Anti-kickback Act (41 U.S.C. 51). This Act provides for the agencies or GAO to direct recoveries of kickbacks on Government contracts. There were some indications of possible violations of Federal criminal law, therefore, the report was referred to the Department of Justice to determine what further actions may be appropriate, as is our normal practice.

We are concerned, however, about the possibility of increased costs to the Government because of questionable procurement practices by prime contractors. Therefore, separate and apart from this report we brought these matters to the attention of the Department of Defense pointing out the need for the Department to give further attention to the adequacy of contractors' procurement practices. Also, we recommended that the Department undertake a review of the agencies surveillance procedures to determine whether they are adequate to disclose problems of this nature and whether additional surveillance procedures over contractors' procurement practices are required. Further, we plan to cover this aspect in our broad review of prime contractors' procurement activities.

#### ADDITIONAL WORK BY GAO IN THE AREA OF PRIME CONTRACTORS' PROCUREMENT ACTIVITIES

Approximately 50 percent of Government prime contract dollars reach subcontractors through contractor purchasing systems. This could approximate \$25 billion a year.

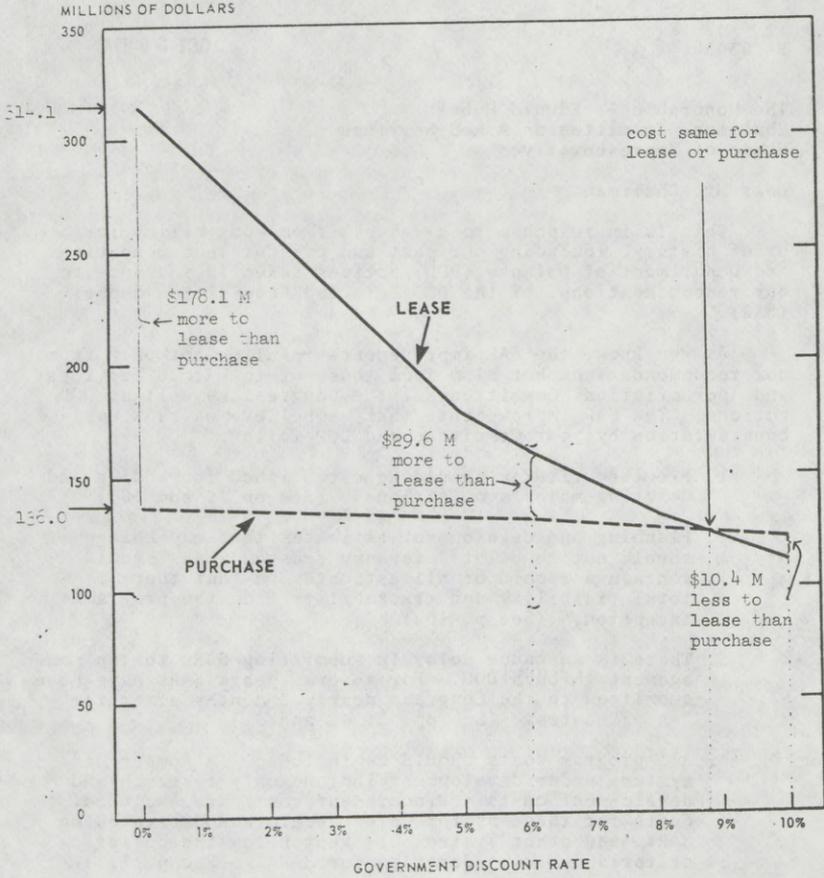
Although there is no direct contractual relationship between the Government and subcontractor, the Government is concerned with the business relationship and practices between the prime and subcontractors, particularly where they can affect costs to the Government. We must continue to assure ourselves that these relationships are not contrary to the Government's best interest.

Although we have previously performed work in this area, we are intensifying our efforts concerning the adequacy of procurement practices of prime contractors in subcontracting under Government prime contracts. We will approach this area by examining the checks and balances over the prime contractor procurement system or what the auditor calls internal control. Initially, we will select several large (by dollar volume) Government price contractors for examination into how well their procurement systems operate.

In addition, we will test the effectiveness of surveillance activities by both the prime contractor and Government contracting agencies.

This concludes my statement, Mr. Chairman. I shall be pleased to answer questions you or the other members of the Subcommittee may have.

COMPARATIVE COSTS OF  
LEASING vs. PURCHASING  
NAVY TANKERS





COMPTROLLER GENERAL OF THE UNITED STATES  
WASHINGTON, D.C. 20548

B-163058

OCT 30 1973

The Honorable F. Edward Hebert  
Chairman, Committee on Armed Services  
House of Representatives

Dear Mr. Chairman:

This is in response to a request from your office for a brief history, including our past and present recommendations and Department of Defense (DOD) actions taken in response to our recommendations, of the DOD Selected Acquisition Report (SAR).

As you know, the SAR improvements resulted not only from our recommendations but also from those of the Armed Services and Appropriations Committees of the Congress as well as DOD actions. The SAR improvements that we believe warrant early consideration by your Committee and DOD follow.

1. Precise criteria should be established for adding and deleting major acquisitions. (See pp. 9 and 10.)
2. Planning and development estimates that may change should not be deleted for any reason. SARs should contain a record of all estimates so that there is total visibility and trackability from the program's inception. (See p. 10.)
3. There is an undue delay in submitting SARs to top management through DOD. For several years SARs have been submitted to the Congress nearly 3 months after the "as of" dates. (See pp. 3, 4, and 9.)
4. All program costs should be included. A number of systems under development include only research and development costs. Procurement costs are excluded. Costs for these systems are therefore understated on SARs, and other systems are kept below the dollar criteria for consideration for SARs. (See p. 11.)
5. SARs should show a comparison of cost incurred, schedule milestones attained, and technical performance accomplished with what was planned for the same period of time and costs budgeted. (See p. 9.)

B-163058

ORIGIN AND PURPOSE

DOD Instruction 7000.3 of February 23, 1968, established the SAR requirement. Before the SAR system was introduced, there were no summary recurring reports on major acquisitions which retained cost, schedule, and performance data for comparison with prior and subsequent estimates.

The SAR system's initial purpose was to keep its sponsor, the Assistant Secretary of Defense (Comptroller), apprised of the progress of selected acquisitions and to compare this progress with the planned technical, schedule, and cost performance.

During 1968 the SAR was in an experimental stage; only eight programs were reported on. In early 1969 the Secretary of Defense established an objective that he be advised regularly of the status of major acquisitions. Concurrently the Chairman of the Senate Armed Services Committee concluded that the Congress should also be regularly informed of the progress of DOD acquisitions and requested periodic reports on such programs. After all parties concerned held discussions, they decided that SARs would be used to advise top DOD management and the Congress of the progress of major acquisitions. As a result of this decision, the SAR became and remains the key recurring summary report from project managers and the services to inform the Secretary of Defense and the Congress on the progress of major acquisition programs.

INTEREST AND IMPROVEMENTS

Since inception the SAR system has been considerably changed and improved. During this time we have worked with DOD and the congressional committees on improving the system.

CONGRESSIONAL OPINION OF THE SAR SYSTEM

The following statements convey the general congressional feeling toward the SAR system.

The House Committee on Armed Services, in its report (91st Cong., 2d sess.), of April 24, 1970, stated:

"With valuable suggestions made by the Comptroller General, the SAR's are being improved to the point where they can become a significant aid to better program management.

B-163058

"The manner in which these SAR's are presented to the Committee, however, leaves much to be desired.

"The Department of Defense has sometimes arbitrarily eliminated statistical information or otherwise altered the material submitted to the Committee."

\* \* \* \* \*

"The Committee is, likewise, disturbed by the timeliness with which these SAR's are submitted to the Committee by the Department of Defense. In many cases the Committee has not received the SAR's, \* \* \* until as much as three months after the close of the reporting period. This greatly lessens their effectiveness to the Committee, particularly during the period when the annual authorization is being considered."

\* \* \* \* \*

"In its attempt to gain a more detailed portrait of military spending, the Committee has become concerned about the inconsistency of various reporting and estimating methods in relation to weapons costs."

"\* \* \* The Committee has been presented with estimated unit costs for aircraft that vary by millions and millions of dollars, depending upon what costs are included or excluded, or what procurement level is provided, and, in some cases, on who is making the estimate. The Committee directs that the Department of Defense determine a consistent cost estimating procedure to be used by all departments \* \* \* to provide a clear display of total program costs and unit costs of weapon systems.

"The Committee is also concerned about the lack of consistent procedures in making long-range cost projections. \* \* \* Since the fact of inflation is undeniable, it is obvious that an alleged cost growth will greet the program again next year. \* \* \* The Committee believes that to make realistic long-range projections which could be truly useful to the Congress it is necessary to have some realistic measure of inflationary trends and the Committee believes that consistent factors should be used in all programs. \* \* \*"

B-163058

The Senate Committee on Armed Services, in its report (92d Cong., 1st sess.) of September 7, 1971, stated:

"Analyses of the quarterly reports received by the committee on selected major weapon programs with projected costs estimated at \$104.6 billion have proved extremely beneficial in assisting the Committee to maintain an oversight of the programs throughout the year and in deliberation on the fiscal year 1972 budget requests. Refinements to these reports have done much to improve the data and additional refinements are expected."

Most recently, the House Committee on Appropriations in its report (92d Cong., 2d sess.) of September 11, 1972, stated:

"The Committee finds it necessary to require improvement in the quarterly Selected Acquisition Report (SAR) in several respects, beginning with the timeliness of their submission. \* \* \* The military departments and OSD [Office of the Secretary of Defense] have had sufficient time to familiarize personnel with this reporting document and to institute the mechanics and required staff for a more timely submission. There is little reason for the inordinate delays experienced in submitting SARs to the Committees."

\* \* \* \* \*

"The Committee has noted that the initial development estimates and the initial planning estimates are being changed in the SARs. \* \* \* The initial planning estimate is the first cost estimate that the Department of Defense brings to Congress for authorization and appropriation. It is recognized these early cost estimates may be incomplete but they should remain as static baselines of program cost and should not be deleted from the report.

"The section relating to additional procurement item costs needs considerable improvement. There should be firm baselines established with footnotes indicating the basis for these baselines, and any changes from these baselines should be provided in the form of a variance analysis.

"In the summary statement, some mention should be made as to the probability of the weapon system

B-163058

achieving its primary mission or meeting original contract specifications. While the SAR does provide certain milestones \* \* \* it does not provide sufficient data indicating the current status of the system development versus where it was planned to be at that given point in time."

\* \* \* \* \*

"Performance characteristics should be tailored to the specific key points of the weapon system, rather than uniform performance characteristics for a class of weapon system."

\* \* \* \* \*

"Current SARs do not now show total weapon system costs. For example, the cost of developing and manufacturing nuclear warheads by the Atomic Energy Commission (AEC) is not included in the weapon system cost even though the warhead and its cost is as pertinent as the weapon's propulsion system."

\* \* \* \* \*

"Many of the foregoing changes have been discussed during hearings last year and this year. \* \* \* Therefore, appropriate changes are to be made in internal instructional documents and memoranda on the SAR reporting system to conform to the foregoing Committee request."

OSD has told us it has met with the House Committee on Appropriations regarding the Committee's needs and desires for data and SAR improvements. As a result of these discussions, DOD has taken actions to (1) send the Committee advance copies of SARs before submitting the final revisions, (2) provide additional information by including AEC costs in those SARs when applicable, and (3) reflect performance characteristics in future SARs tailored to specific key points of the system rather than uniform characteristics for a class of weapon systems. Otherwise DOD believes the current DOD Instruction 7000.3 satisfies the Committee's desires. Other areas of Committee interest will be discussed before changes are made.

B-163058

DOD IMPROVEMENTS IN SARs

Since the SAR system was established in 1968, a great deal has been accomplished and the system has been considerably changed. DOD Instruction 7000.3 was revised in December 1969, June 1970, September 1971, and April 1972 to incorporate changes in the standard format and instructions to be followed by DOD components in responding to Secretary of Defense requirements for summary reporting of technical, schedule, quantity, and cost information concerning major acquisitions. Some of the principal improvements are cited below.

Definition of costs

In response to the House Armed Services Committee report of April 24, 1970, pointing out that DOD should provide a clear display of total program and unit costs of weapon systems, DOD developed a fact sheet concerning weapon system cost displays. It was submitted to the Committee and the services on May 19, 1970. DOD guidance to the services stated that the terms defined in the fact sheet should be uniformly applied but that DOD recognized that some realignment will be necessary within certain procurement line items to provide for complete consistency.

The fact sheet stated:

"\* \* \* It is now our intent that this special vocabulary shall consist of four (4) terms which, if uniformly applied and understood, should go a long way towards alleviating the difficulties the committee has experienced. These terms are 'Flyaway Cost,' 'Weapon System Cost,' 'Procurement Cost,' and 'Program Acquisition Cost.' \* \* \*"

"The terms 'Flyaway Cost,' 'Weapon System Cost,' and 'Procurement Cost' have application to the appropriations within the 'Procurement Title' of the DOD Authorization and Appropriation Bills. The basic method for presenting procurement requirements is the Weapon System Line Item Listing (Exhibit P-1) for the Appropriations Bill and its counterpart Section 412 Weapon System Line Item Listing for the Authorization Bill. It is intended that the line item should include all procurement costs required to acquire and initially deploy a weapon system except for its complement of initial spares, which is budgeted as part of a separate line item covering all initial spares for all systems. Within the individual

B-163058

weapon system line item, those costs which are related to the production of a usable end item of military hardware are commonly referred to as 'Fly-away Costs.' This term has evolved in connection with aircraft and missile programs, although it should be understood that it equates to what could be called 'Rollaway' in the case of vehicles or 'Sailaway' in the case of ships. It includes the cost of the basic unit to be fabricated (airframe, hull, chassis, etc.), the propulsion equipment, electronics, ordnance, and other installed government furnished equipment.

"The balance of the individual weapon system line item contains those peculiar procurement costs required to deploy a system, such as ground support equipment, training equipment, publications, technical data, contractor technical services, etc. The sum of these two segments within the line item is referred to as 'Weapon System Cost.' As stated above, in order to arrive at the total amount within the Procurement Title related to the acquisition of a weapon system, we must add the associated initial spares to the 'Weapon System Cost.' The sum of these two amounts represents the 'Procurement Cost' which appears in the program acquisition cost section of the Selected Acquisition Report (SAR). This section of the SAR also contains those 'Research, Development, Test, and Evaluation (R,D,T&E)' and 'Military Construction (MILCON)' costs related to the acquisition of a weapons system. The sum of the RDT&E, MILCON, and 'Procurement Cost' represents the term 'Program Acquisition Cost.'"

#### Application of inflation

Also, in response to the Secretary of Defense's (Comptroller's) report of April 24, 1970, pointing out that some realistic measure of inflationary trends is necessary, DOD issued a memorandum on June 30, 1970, entitled "Weapon System Costing." It stated, in part:

"cost estimates will reflect the best estimates of the amounts ultimately to be paid, specifically incorporating anticipated changes in future prices. Wherever practicable, this will be accomplished on the basis of specific data applicable to a given system, considering such factors as contract provisions, labor agreements, productivity and quantity

B-163058

changes, and the extent to which material is on hand or under fixed-price contract. In other cases, it will be necessary to base the estimates on forecasts of changes in price levels."

\* \* \* \* \*

"The pricing policies set forth in this memorandum will be reflected \* \* \* in the SAR's as of September 30, 1970 \* \* \*."

#### Changes in data presentation

The SAR has been revised numerous times to provide for easier reading and analysis. The initial SARs prepared in 1968 and 1969 did not identify the program cost variance explicitly, and, as a result, cost growth could not be segregated by its various causes. Our February 6, 1970, report (B-163058) suggested that DOD give increased attention to the problem of identifying specific cost growth factors. Consequently DOD revised its instructions on June 12, 1970, to provide nine categories of cost variance for use in the SAR system.

In 1970 and 1971 SARs were rather voluminous, some with 60 pages or more. DOD, recognizing that management does not have the time to review and analyze such documents, revised DOD Instruction 7000.3 on September 13, 1971, to provide that no SAR would have more than 13 pages unless the Assistant Secretary of Defense (Comptroller) grants a special waiver and that 10 pages or less is desirable.

On May 25, 1972, the Assistant Secretary of Defense (Comptroller) issued new reporting requirements for the Logistic Support/Additional Procurement Cost section of the SAR. This letter stated, in part, that in the interest of uniformity and clarifying and simplifying the reporting requirement, only modification and component improvement costs will be reported. The instructions also stated that the period covered by these costs will be from program inception through either the last year of the Five Year Defense Program or the last year of procurement of the basic system, whichever is later.

#### OUR EVALUATIONS OF SAR SYSTEM

In 1969 we became involved in evaluating the SAR system and working with DOD and congressional committees on improving it.

B-163058

Results of our initial review of the system, undertaken in August 1969, were published in our report entitled "Status of the Acquisition of Selected Major Weapon Systems" (B-163058, Feb. 6, 1970).

That report concluded that the system, in concept, represented a meaningful management tool for measuring and tracking the progress of major acquisitions. Like any new reporting system, the SAR system had some serious shortcomings. SARs had failed to show such significant information as (1) a comparison of demonstrated performance with that specified in the contract, (2) the status of key subsystems essential to mission accomplishment, (3) costs incurred in relationship to the costs planned to be incurred, (4) significant pending decisions that may affect the program, and (5) a comparison of quantities delivered with those scheduled to be delivered at the same time.

Results of our second review of the SAR system, undertaken in August 1970, were published in our report entitled "Acquisition of Major Weapon Systems" (B-163058, Mar. 18, 1971). That review confirmed that improvements had been made since our first report was issued but that improvements were still needed. We concluded that SAR still did not (1) contain a summary regarding overall acceptability of the weapon for its mission, (2) recognize the relationship of other weapon systems complementary to the system, or (3) reflect the status of programs.

In August 1971 we initiated our third review of the SAR system, which was directed toward evaluating its value to management. While DOD was continuing to improve the system, two principal problems identified related to changing baselines for measuring progress and credibility of cost estimates. We concluded that static baselines should be reported and maintained in the SAR and that complete and realistic cost estimates were needed. Both are essential in evaluating the progress of major acquisitions and in making decisions on the system's future progress. In addition, we concluded that (1) a recurring problem was the undue delay in submitting SARs to top management through DOD and (2) the criteria for designating weapon systems for SAR reporting should be reassessed, to improve management visibility on additional major weapon systems. The conclusions were published in our report entitled "Acquisition of Major Weapon Systems" (B-163058, July 17, 1972).

In February and March 1973 we issued 68 staff studies to the Congress evaluating SARs on applicable systems. An

B-163058

analysis of our work indicates that more precise criteria should be established for including major acquisitions for SAR reporting. DOD Instruction 7000.3 provides that SARs are required for all programs designated as major by the Secretary of Defense and will usually be those programs which require a total of \$50 million for RDT&E or \$200 million for procurement. Other systems not qualifying under these dollar guidelines may be designated for SAR coverage by the Secretary.

Though criteria for SAR reporting should include dollar limitations, the above dollar criteria by themselves may preclude systems critical to the national defense from being included or even from being considered for SAR reporting solely on the basis of minimum dollar limitations. Thus the urgency of need should also be included in the criteria for SAR reporting. In addition, factors should be included in the criteria to specify when in the acquisition process systems should be added or deleted.

DOD has no formal process for deciding whether a major system should be included in the SAR system. We were informed that systems are selected for the SAR system on the basis of recommendations from the services or OSD and/or on the basis of interest in a system by the Congress or GAO.

Establishing and monitoring baselines for major acquisitions continues to be one of the most significant problems which must be resolved to improve the SAR as a key information report. To measure program progress, management must have a baseline. At the outset of any program, a planning estimate is established and periodically changes as the program progresses. The initial planning estimates could be reported as ranges of dollars. Once the planning estimate becomes static, it should not be changed and should remain on the SAR for tracking purposes.

A similar approach could be taken with the development estimate. It could be labeled as "initial" and stated as ranges of probable cost until the development contract was awarded. Subsequently, the development estimate should remain static.

Adding a production estimate to SARs should also be considered. This would be "initial" until the production phase begins, just after DSARC III, and would become static once the production contract is awarded.

B-163058

The current estimate through completion would remain as is. This approach should be taken with the Logistic Support/Additional Procurement cost section of SARs.

In this manner, the estimates would be more meaningful to SAR readers and users. There would be greater visibility over the life of the program because historical tracking would be enhanced.

Also certain SARs prepared for systems in the early stages of acquisition did not show procurement costs. SARs should include all program costs, even in these early stages.

As you know, we are continuing to monitor a number of major acquisitions and will make further suggestions to DOD and the Congress to improve SARs.

We trust that this information will satisfy your needs.

Sincerely yours,



Comptroller General  
of the United States

Chairman PROXMIRE. Did you want to take a moment to explain your chart, attachment I to your prepared statement, or can we proceed right to the question?

Mr. STAATS. We brought the chart, Mr. Chairman, because the application of discount rates for decisions of this type is very complicated.

Chairman PROXMIRE. I expect so. Suppose we wait, and I think there will be some questions on it.

Mr. STAATS. We can use it then, but otherwise not.

#### KICKBACK ON LARGE CRANE PURCHASE BY LITTON SHIPBUILDING

Chairman PROXMIRE. Before getting into the kickback allegations which you investigated, I would like to ask about the kickback case involving the large crane purchased by Litton for the shipbuilding division. As you know, the subcommittee staff turned some facts about this case over to your staff and it was decided not to include it in your investigation because the Justice Department was already investigating it. I understand that Justice has had the crane case under investigation since early 1971. Can you briefly summarize the facts in this case and tell us what progress the Government has made on it and whether there have been any indictments?

Mr. STAATS. I would like for Mr. Gutmann to answer your question, Mr. Chairman—I believe he is prepared to answer that question.

Mr. GUTMANN. Mr. Chairman, the current status of the case is unknown to us at this time. We are unable to find out from the Department of Justice what their plans are and where they stand.

Chairman PROXMIRE. You say you are unable to find out? Have you been trying to find out?

Mr. GUTMANN. Yes, we have.

Chairman PROXMIRE. What has been their response?

Mr. GUTMANN. Traditionally, and by practice, the Department of Justice does not discuss the details of a case with us while they have it under investigation. Now, as far as the details of that situation, we have a representative here from our office in New Orleans that considered that case along with the other cases we have in our report. And with your permission, I would ask one of them to talk about it and to answer the questions.

Chairman PROXMIRE. Could you briefly summarize that for us?

Mr. STAATS. Yes, I am sure he could.

And I would like to introduce Marvin Doyal from our New Orleans suboffice, who is the audit manager on this job.

Chairman PROXMIRE. Mr. Doyal come forward and take a position here at the table for a few minutes, just long enough to give us an explanation of this.

Mr. DOYAL. The crane case, as it has been referred to, was the purchase of a large American Whirly crane by Ingalls Shipyard from C. H. Bell & Co. of Portland, Oreg. There has been an allegation that a \$125,000 kickback payment was attempted but not completed. It is under investigation by the Department of Justice. There have been grand jury hearings. But we do not know what the results of those were.

Chairman PROXMIRE. Can you tell us anything about who was involved on the part of Ingalls in this alleged kickback, and whether they were officers of the company, or whether they are still with the Ingalls Co.?

Mr. DOYAL. Yes, sir. The three persons whom the allegations have been made against are Mr. Nick Milakovich, vice president, operations; Mr. Gerald Starling, manager, modular translation, heavy lifts and rigging; and Mr. Anthony Gelsomino, section manager, project tool design and planning, advanced methods and manufacturing technology.

Chairman PROXMIRE. Are they still with the company?

Mr. DOYAL. No, they have all terminated their employment with Ingalls.

Chairman PROXMIRE. When was that employment terminated?

Mr. DOYAL. About July of 1972, sir.

Chairman PROXMIRE. Thank you very much, Mr. Doyal. We appreciate that, it is very helpful.

Now, I would like to go through each of the cases in your report. Before doing so, however, I point out that the role of this subcommittee is strictly an economic one. We are not making any accusations or judgments regarding criminal actions and we are not attempting to conduct a trial. Because names of companies and individuals have been mentioned in the GAO report, I instructed the staff to notify each person mentioned about the hearings, to provide them with advance copies of the report, and to invite them to appear before the subcommittee as witnesses or to submit written comments on the report. Would you, Mr. Staats, summarize your findings for the first of the cases in the report, the Niedermeyer lumber subcontract?

#### CASE 1. NIEDERMEYER LUMBER SUBCONTRACT

Mr. GUTMANN. Mr. Chairman, again I would like to summarize the case, and then ask the men who are most familiar with the details to respond to your questions.

A good summary of the first case, of all the cases, appears in our transmittal letter to you. And I will read from that.

Appendix I deals with purchases of lumber products by Ingalls from two subcontractors. In these instances, Ingalls' records indicated that preaward activities may have been conducted in a manner that insured awards to certain subcontractors. One contract was awarded to other than the lowest bidder, although the low bidder appeared to meet the procurement requirements. The records of this successful subcontractor show that \$75,000 was paid in commissions for Ingalls' business. Of this amount, \$40,000 was paid to another subcontractor who had also bid on the contract. The remaining \$35,000 was paid to an agent of the subcontractor. During this review, the payment of \$40,000 was returned to Ingalls and we were advised that appropriate adjustments would be made to the applicable Government contracts.

The other successful subcontractor did not become the low bidder until the third resolicitation for bids. This solicitation increased the scope of the work, causing the other three responsive bidders to increase their bids while the successful bidder submitted a decreased price. After the award, the contract was changed to eliminate the requirements that increased the scope of work under the third resolicitation.

Chairman PROXMIRE. So what happened was that the bidder who had been high before the increased work was successful in getting the subcontract, and as far as the work that he actually did was concerned, he was still high, is that right?

Mr. GUTMANN. Yes, sir.

Chairman PROXMIRE. It seems that this additional work, on the basis that you present this, was a subterfuge. Was that your conclusion?

Mr. GUTMANN. Well, we were really unable to conclude as to all the motivations involved here. There were really four rounds of bidding, and a final offer. The successful bidder's first bid was for \$368,083 approximately. And then there was a change in the invitation for bids. The bidder would be required to establish a facility nearby the Ingalls plant shipyard, and to chemically treat the lumber.

The second bid, then, was \$388,850 by the successful bidder, a difference of \$20,767.

And then in January of the following year they asked for another round of bidding, at which the chemical treatment of the wood to make it fire retardant was deleted. And that bidder reduced his price by \$99,604, to \$289,246.

There was still a fourth round, at which there was a minor change in the wording of the specifications. That successful bidder reduced his bid another \$54,227—I might say that at the fourth round the successful bidder was then low, of the four subcontractors that bid. But when he made his best and final offer, he came in with still a lower figure of \$230,364. And thus he won the award.

Now, the changes from one invitation to another influenced the bids of all the proposers in varying degrees. On the first one, one bidder reduced his bid while all the others increased theirs. After the third round, where the chemical treatment was taken out of the specifications, the reductions ranged from \$233,000 down to about \$100,000.

But the indications are, or the situation is so questionable, that we felt that this matter should be investigated by the Department of Justice.

#### ROLE OF PAYMENTS BY INGALLS TO BENTON

Chairman PROXMIRE. The key, of course—what we are getting at is whether or not there was a kickback here.

Please explain the role of Mr. Benton in the awarding of the subcontract. I understand that Niedermeyer paid him about \$35,000 and then the payments were classified as commissions on Ingalls' business. Who is Mr. Benton, what is his relationship to Ingalls Shipbuilding Division or Litton, and what did he do to earn the \$35,000?

Mr. GUTMANN. I will ask Mr. Doyal to come forward again, Mr. Chairman.

Chairman PROXMIRE. Mr. Doyal.

Mr. DOYAL. Let me go back if I can and start a little earlier. The bidding is related to the *Miron* case that Mr. Gutmann explained, and not to the *Niedermeyer-Martin* case. Niedermeyer-Martin paid Mr. M. L. Benton \$35,000 which was classified as commission on Ingalls business. Mr. Benton had entered into an unwritten agreement with Niedermeyer-Martin, according to his statement, to be their exclusive agent for three States, Louisiana, Alabama, and Mississippi. As a result of this agreement, he told us that he was entitled to five percent

of all the Niedermeyer-Martin sales in those three States. And the shipyard is at Pascagoula, Mississippi. And he says that is why he was entitled to \$35,000 in this procurement.

Chairman PROXMIRE. Where does Benton live? Doesn't he live in Michigan?

Mr. DOYAL. Yes, sir.

Chairman PROXMIRE. What is he doing in Mississippi?

Mr. DOYAL. I am not sure. He acts as an agent for a number of companies as a manufacturer's representative.

Chairman PROXMIRE. Did they know him at Litton?

Mr. DOYAL. No, sir; they did not. We did not find any one from there who knew him as a manufacturer's representative or as representative for Niedermeyer-Martin. We did find people at Ingalls Shipyard who knew Mr. Benton socially, and one man there who had been a partner with Mr. Benton in a restaurant and bar in Pascagoula.

Chairman PROXMIRE. Didn't you find a whole series of phone calls made by Mr. Benton, some 90 phone calls?

Mr. DOYAL. Yes, sir.

Chairman PROXMIRE. What were those all about? Did he explain that?

Mr. DOYAL. No, sir; he did not. He gave us access to his records, and we identified 90 phone calls made by him to a phone number, or a number of phone numbers, in the Pascagoula area. Most of those went to the man who later identified himself as Mr. Benton's partner in the restaurant and bar in Pascagoula.

Senator JAVITS. And what was his job with Ingalls?

Mr. DOYAL. He was in the valuation section or methods evaluation and test section.

Chairman PROXMIRE. By the way, are the ex-Ingalls officials referred to in the report also allegedly involved in the crane case?

Mr. DOYAL. Yes, sir.

Chairman PROXMIRE. What were their positions with the company at the time of the Niedermeyer transaction and what was their involvement, if any, in the awarding of the subcontract?

Mr. DOYAL. The men you are referring to are Mr. Milakovich, Mr. Starling, and Mr. Gelsomino. Mr. Milakovich was vice president and at the same time of the Niedermeyer-Martin award, Mr. Starling was manager of heavy lift and rigging, and Mr. Gelsomin was in the evaluation section.

And let me refer to some notes here.

Chairman PROXMIRE. The point is that those were high officials, and they were involved in both of those cases.

Mr. DOYAL. Yes, sir.

Chairman PROXMIRE. Summarize the facts in the *Gulf Coast* case.

#### FACTS OF THE "GULF COAST" CASE

Mr. DOYAL. The *Gulf Coast* case involved Ingalls' purchase of X-raying welds to determine that the welds are appropriate—from a firm named Gulf Coast Inspection and Testing. The incorporators of Gulf Coast Inspection Testing Service, according to records in the State of Mississippi Department of State, were a Mr. Inabinette and Mr. Scordino. Mr. Inabinette and Mr. Scordino were both em-

ployees of Ingalls Quality Assurance Division. They received and certified the receipt of services that were purchased from the firm they had helped to incorporate.

Chairman PROXMIRE. Would you agree that in this case there was a gross and flagrant conflict-of-interest on the part of the Litton employee who influenced the awarding of a subcontract to himself?

Mr. DOYAL. I know that Mr. Inabinetta was discharged because of the involvement, and Mr. Scordino was still employed by Ingalls.

Chairman PROXMIRE. Is there any law or government regulation which prohibits this conflict of interest?

Mr. DOYAL. I am not a lawyer but there is no law that I am aware of that prohibits a conflict of interest, except as far as Government employees are concerned, sir.

#### CONFLICT OF INTEREST AND THE ANTIKICKBACK LAW

Senator PROXMIRE. As I understand the antikickback law, its primary purpose is to prevent the Government from being overcharged for subcontract work on Government procurements. Don't conflicts of interest such as this one leave the door wide open and increase the possibilities for overcharges?

Mr. DOYAL. May I ask Mr. Shnitzer to speak to that?

Mr. SHNITZER. I think, Mr. Chairman, your assumption is correct. There is at least a possibility that a conflict of interest may result in some additional payment. I do not understand, however, that in this case we have established that in fact the payments were larger than they would have been if the subcontracts were awarded to another firm. If those people were Government employees, they would be at least in violation of the regulations which generally apply.

Chairman PROXMIRE. How do you know the services were actually performed in this case?

Mr. SHNITZER. I would have to defer to these other gentlemen in terms of whether or not they were actually performed, but I assume that there are records that indicated that they were.

Chairman PROXMIRE. Were there such records?

Mr. DOYAL. There were records which indicated that the services had been performed, yes, sir.

Chairman PROXMIRE. But the employees made those records themselves, did they?

Mr. DOYAL. They did.

Chairman PROXMIRE. And they are the ones who are supposed to have performed the services?

Mr. DOYAL. Yes, sir.

Chairman PROXMIRE. Tell us about the condenser service case.

#### FACTS OF THE CONDENSER SERVICE CASE

Mr. DOYAL. The condenser service case involves the award of a \$6.4 million subcontract to the Condenser Service Engineering Co., Inc. Immediately after the award the Ingalls subcontract administrator and cognizant engineer terminated their employment with Ingalls and went to work for the successful subcontractor. The subcontract administrator is now president and sole owner of the company that was awarded the subcontract.

Chairman PROXMIRE. Is it also correct that the subcontractor offered a loan of \$5,000 to one of the Litton employees following the award of the subcontract?

Mr. DOYAL. We have found evidence that there was an offer of a loan to one of the Ingalls employees after he had terminated his employment with Ingalls.

Chairman PROXMIRE. You say you have found evidence. Do you know the loan was made?

Mr. DOYAL. Yes, sir, we have knowledge that the loan was made to him after he terminated.

Chairman PROXMIRE. Was the loan ever repaid?

Mr. DOYAL. No, it was not.

Chairman PROXMIRE. Is it also true that the subcontractor did not acquire the plant where the manufacturing was to be done on the subcontract until after the subcontract was awarded?

Mr. DOYAL. Yes, sir, that is true.

Chairman PROXMIRE. Do you know whether it is a common practice for subcontractors to bid for Government work before they have the actual capacity to perform the work?

Mr. DOYAL. No, sir, I don't know.

Chairman PROXMIRE. Mr. Staats, would you comment on that? Doesn't that seem to be, at best, unusual?

#### NEED MORE ADEQUATE CONTROLS ON SUBCONTRACTING PRACTICES

Mr. STAATS. It would be unusual. I did not read the last page of my prepared statement, Mr. Chairman. I think it pertinent, though, at this point to say that partly as a result of this case which you referred to for us to pursue, we feel that both we and the Secretary of Defense need to take another hard look at the whole system of subcontracting. As you pointed out, and as I have pointed out, about 50 percent of those dollars are actually spent by the subcontractor. So there is an obvious question of whether or not there are adequate controls on the part of the prime contractor. And I don't think the Federal Government can just wash its hands and say, that is the business of the prime contractor, to worry about those things, if the Federal Government ends up paying half the bill.

Chairman PROXMIRE. That is right. As we pointed out, one-half that is something like \$18.5 billion, of the \$37 billion of prime contracting goes into subcontracts, and it is 50 percent of the basis for the cost of Government contracts.

I would like to ask Mr. Morris if he doesn't recall that this subcommittee has been pressing for years on this to try to get on top of these subcontracts and try to get the DOD to exercise greater vigilance and greater protection for the taxpayer with respect to subcontracts.

Mr. MORRIS. That is correct, sir. And we did testify even last year about some of the work we had done at Ingalls and elsewhere looking at subcontract practices, and a finding that the Department of Defense needed to do more to examine the subcontract procedures of its prime contractors.

Chairman PROXMIRE. As a former Assistant Secretary of Defense and one who is greatly respected by this committee, and the people in the Defense Department, too; would you comment on whether you

think the Defense Department does exercise adequate surveillance and oversight with respect to those subcontracts?

Mr. MORRIS. Sir, it would be impossible to generalize on that question. I think this is an area that obviously needs some renewed attention, some revitalization, as it were. And this is the reason, as Mr. Staats testified, we have just addressed the Secretary of Defense, urging that he look at the surveillance procedures of the military departments in this area.

Chairman PROXMIRE. The last case involves Daco Industries. Can you summarize this for us?

#### FACTS OF THE DACO INDUSTRIES CASE

Mr. DOYAL. Yes, sir. There were 22 subcontracts awarded to Daco Industries after Ingalls personnel were aware that they had financial difficulties. Daco is now bankrupt. Ingalls is continuing to provide funds for Daco's operation.

Chairman PROXMIRE. Can you give us any explanation of why Litton kept giving the subcontracts to a failing company?

Mr. DOYAL. The explanation provided to us by the vice president of materiel, Ingalls, is that he didn't have confidence in the person who was making the warnings, and that he had no clear evidence on which to disqualify Daco as a bidder for future contracts.

Chairman PROXMIRE. Should he have that information as a prudent businessman on the basis of your investigation, or can't you make that conclusion?

Mr. DOYAL. I can't make that conclusion, sir.

Chairman PROXMIRE. Can you estimate the increased cost to the Government as a result of Litton's action in the Daco case?

Mr. DOYAL. No, sir, we cannot. We have not been able to determine whether or not there will be increased costs as a result of this.

Chairman PROXMIRE. Would you agree that Litton's action in this case amounts to a clear case of mismanagement?

Mr. DOYAL. I couldn't make that determination.

Chairman PROXMIRE. Would you have any judgment on that, Mr. Staats?

Mr. STAATS. No; I don't think I would have any general judgment on that point.

I might add, Mr. Chairman, that we have had very good cooperation from Litton in conducting this investigation. We have had no problems of access to people or to records from them. But I don't believe that it is appropriate to generalize, as Mr. Morris has said, from those five cases into a general kind of a judgment that you have asked me about.

#### ROY ASH—RESPONSIBLE FOR IRREGULARITIES

Chairman PROXMIRE. Did you question Mr. Roy Ash about this? He was the head of Litton during all of those transactions, when all this was going on. And he should have had some knowledge of it.

Mr. DOYAL. No, sir.

Chairman PROXMIRE. Why not? Wasn't he the chief executive officer of the overall company?

Mr. DOYAL. Yes, sir, he was. But our work dealt primarily with actions that have taken place at Ingalls Shipbuilding Division of Litton.

Chairman PROXMIRE. Doesn't GAO formally assume that the top management of the company does have a responsibility here, and that they should at the very least be able to give you information as to why those sorry events transpired?

Mr. STAATS. Well, that is really what our follow-on study is going to address itself to, Mr. Chairman. Some companies said if they are dealing with the prime, that the prime is the man that is responsible, and you deal with him. And it is his job to manage his subcontracts. And this is what I think the broader issue here is all about.

Chairman PROXMIRE. I just wonder if Mr. Ash has demonstrated the kind of competence and responsibility as head of Litton on the basis of the record we have here that would qualify him for his present job. After all, he has one of the three or four biggest jobs in the Government. Director of the Office of Management and Budget is an immensely responsible job. And it does take just the kind of vigilance that seems to have been missing in these cases.

Mr. GUTMANN. Mr. Chairman, our contact at the corporate level of Litton was primarily with Mr. Hagerman, who is director of their security division. I should also add that many of the allegations that were provided to us came from Mr. Hagerman. So Litton knew a lot about what was going on there before we started the review—and, in fact, as you know, some of the top officials had resigned.

Chairman PROXMIRE. My staff denies that. They said that we didn't get any allegations from Hagerman.

Mr. GUTMANN. We did. You see, our contact—

Chairman PROXMIRE. Yes, but much of the information that you based your investigation on, as you indicated, came from the staff of this subcommittee, right?

Mr. GUTMANN. We got additional and separate allegations from Hagerman—

Isn't that right, Mr. Doyal?

Mr. DOYAL. Yes.

Chairman PROXMIRE. At least Litton didn't give us any directly.

Aside from what the Justice Department may do, what steps do you think the Government ought to take to prevent such a situation from arising? Do you believe that new legislation is required to plug what may be loopholes in the law?

Mr. STAATS. We are going to be looking at that question to see if it should be included in the scope of our review.

Chairman PROXMIRE. You feel that there is nothing that you can tell us now until you have completed that investigation, or would you prefer to do that first?

Mr. STAATS. I defer to Mr. Morris and Mr. Gutmann on that, Mr. Chairman, to comment at this point. But I assume that this would be the kind of thing that we would be looking for to make recommendations on it. We think this would be helpful.

Mr. MORRIS. I think it would be much better to complete the review we have just started, sir.

Chairman PROXMIRE. How much time will it take?

Mr. MORRIS. Mr. Gutmann.

Mr. GUTMANN. We hope to finish it within a year.

Chairman PROXMIRE. Within a year. The fall of 1974?

Mr. GUTMANN. Yes, sir.

Chairman PROXMIRE. And you feel you will have the recommendations to us for action at that time?

Mr. GUTMANN. Yes, sir.

B-1 BOMBER—\$2 BILLION COST INCREASE

Chairman PROXMIRE. Let me get into something else.

In the GAO report released yesterday on the financial status of selected major weapon systems, you show a new increase for the 45 selected weapons of \$2.7 billion during the 6-month period from December 31, 1972, through June 30, 1973. The B-1 bomber accounts for most of the increase, more than \$2 billion. That is a huge increase in just a few months. It almost equals the amount the American taxpayer is being asked to contribute to the costs of the Middle East war. The report briefly explains the causes of the increase as a consequence of added weight and inflation. Can you tell us any more about the cost increase? Why is weight being added to the plane? Are they adding on more electronic gadgets or are they having structural problems?

Mr. GUTMANN. Mr. Chairman, with your permission I would like to ask a supervisory auditor from my office, George Wooditch, who is what we call a system monitor on this particular program. He maintains constant surveillance of activities, and as a consequence would be very knowledgeable about the program.

Mr. WOODITCH. There have been several reasons for weight increases. I am not sure of all the reasons right now. But it has been increased from an initial planning estimate of 356,000 pounds to 389,772 pounds. This is very close to the 395,000 pounds in flight gross weight maximum. At this point they would have to have tradeoffs.

Chairman PROXMIRE. How much? \$2 billion overrun or increase as a result of that weight increase? Do you have any idea, a rough estimate?

Mr. WOODITCH. \$474.8 million in weight increases.

Chairman PROXMIRE. Did you say you don't know whether this was a result of structural problems? In the past with the C-5A, for instance, they increased their weight, and that was one of the reasons for the big overrun—and because they had a lot of problems with the wing, the structural design was defective.

Mr. GUTMANN. We would like to supply that for the record, Mr. Chairman.

[The following information was subsequently supplied for the record:]

In the planning estimate of early 1970 for the B-1, the takeoff weight basic design of 356,000 pounds was established on the basis of parametric studies for the air vehicle configuration which was just then being established. In June 1970 the airframe and engine contracts were awarded. Study efforts continued and in November 1970 the engine thrust size and aero/thermodynamics cycle definition were established. As a result of this milestone, as well as development design evolution, the approved program takeoff weight was established at 360,000 pounds.

The B-1 System Program Office informed us that the detailed design process on the B-1 to date has resulted in rather complex structures which are currently

estimated, in aggregate, to weigh somewhat more than was estimated in the parametric design. One additional factor influencing this process was consideration of airplane handling qualities which led to a need for additional stiffness in the aft fuselage with a resultant adverse weight impact in that area. As of September 30, 1973, the current estimate of the takeoff weight in the B-1 Selected Acquisition Report was 389,772 pounds—an increase of 29,772 pounds. The weight increases and decreases in the structures, fuel load, and other loads were as follows:

	<i>Weight increase or (decrease)</i>	<i>Pounds</i>
Wing -----		5, 149
Tail -----		(156)
Body <sup>1</sup> -----		8, 740
Gear -----		(28)
Nacelle -----		1, 042
Air induction -----		(1, 071)
System <sup>2</sup> -----		4, 557
Fuel -----		11, 905
Other useful loads <sup>3</sup> -----		(366)
Net weight increase -----		29, 772

<sup>1</sup> Includes an increase of 2,373 pounds for the wing carry-through structure.

<sup>2</sup> Includes an increase of 67 pounds for installed engines. Contained in systems are: surface controls, propulsion group, auxiliary power, instruments and navigation hydraulics, electrical, electronics (avionics), armament, furnishing and equipment, air conditioning, and auxiliary gear.

<sup>3</sup> Contained in other useful load are: crew of 4, fuel (unusable and internal), trapped oil, payload, missile launchers, survival gear of food and water, and liquid nitrogen.

We were informed by the B-1 System Program Office that the above weight changes result from many small weight changes—some upward, some downward—as the structural design has evolved from the parametric airframe design to a firm hardware design for the initial flight test air vehicles. They also stated that the values in the Selected Acquisition Report (SAR) represent a projection of this firm design to that of the potential production airframe configuration and, although better visibility exists upon which to base the estimate, the value presented in the SAR is, and will be for some time to come, an estimate which has not been validated by actually weighing a production vehicle.

Chairman PROXMIRE. I think that is very important, because an increased weight problem is usually a clear sign that they are having trouble with the overall plan, the design, and so forth, and there is likely to be more trouble in the future. You said that this was less than \$500 million, the weight part of it, the \$2 billion? We all know how serious inflation is. But in 6 months to have an inflation factor of anything like a billion or a billion and a half seems extraordinary. What was your judgment on that?

Mr. WOODITCH. The reason for the increase was they used a new OSD factor of 3.1 percent for procurement rather than a factor of 1.94 percent that they were using. And this increased it by \$1,576 million.

Chairman PROXMIRE. On every weapons system?

Mr. STAATS. They did this across the board. I think we would have to agree—

Chairman PROXMIRE. Why does it show up so conspicuously on this? As I pointed out, of the increases, the lions' share is in the B-1 bomber, there is nothing at all compared to this. In fact, some weapons systems—there are actually decreases, as you know.

Mr. GUTMANN. Mr. Chairman, there was in April 1973 a new across-the-board directive from OSD to the services as to how inflation was to be computed; that is, at what rate. This accounts, of course, primarily for the B-1 as the Air Force changed from the inflation rate they had been using previously to the new OSD guidance. Now,

the problem with the question of why all the other systems didn't increase proportionately is this, that there is not a consistent treatment of inflation either as between the services or as between weapons systems within a given service. The guidance provided by OSD appears to allow some leeway. And that leeway is applied in some cases by project managers, who think, for example, that the cost indexes upon which they are to compute inflation are not proper for the particular area of the country in which their program—

#### AIR FORCE CHANGES INFLATION FACTOR ALMOST AT WILL

Chairman PROXMIRE. The way you explain it, it sounds as if they just increased their inflation factor at will in terms of timing at least, they do it anytime they want to. And it doesn't seem to relate to the actual developments or to the industrial wholesale price index or anything of that kind. It is not keyed to an index. That would be an objective measure that would give them a justifiable basis.

Mr. GUTMANN. That is true to a certain degree, yes. And as you know, many people have trouble with the cost indexes coming from BLS from the standpoint of the fact that they are nationwide averages that may not be applicable to a weapon that is being produced, for example, on the west coast as contrasted to one on the east coast.

Chairman PROXMIRE. Do they break it down on the basis of actual cost experience, in other words, do they show that they were now beginning to pay not 1.9, but 3.1 more than they had in the previous time period?

Mr. GUTMANN. No, sir; they don't break it down in that fashion, primarily because most of the estimates on the major programs such as the B-1, there hasn't been a lot of costs incurred yet. They are out year estimates, as it were, and as a consequence, no one knows what inflation is likely to be experienced during the runout period of the contracts.

Mr. STAATS. I think you can see, though, the logic—a weapons system that is just in the early stages, if they revised the overall index up, which is going to apply to the full lifetime of the development and production of that weapon, it is going to have a much more dramatic effect than one which is pretty well completed.

I think we would have to agree that the earlier overall estimates, Mr. Chairman, of inflation are unrealistic, and had no real bearing upon reality at all. We could find—

Chairman PROXMIRE. There is no rhyme or reason between various weapons systems—the F-15, for instance, is an \$8 billion program, and it had no increase at all during this program.

Mr. STAATS. We think they have still got real problems in applying the inflation factor on those systems. I don't think they have got the solution of the problem yet.

#### MORE PROBLEMS WITH THE INFLATION FACTOR

Chairman PROXMIRE. Aren't they supposed to take this into account when they award the contract? Isn't the inflation factor built into the contract?

Mr. GUTMANN. Yes, sir. In many contracts that are to cover a long period of time of production that they can visualize, it is impossible to

estimate with a high degree of accuracy what the costs in later years are likely to be. They will include a price escalation clause for adjusting the contract price.

Chairman PROXMIRE. But there is also an escalation clause, contractors always build into their estimates the inflation factor. They have been through this now for years. That is why I am shocked by this sudden sharp increase here which, on the basis of the whole program, seems to amount to close to 20 percent increase in 6 months.

Mr. GUTMANN. I think we have to draw a clear distinction, Mr. Chairman, at this point, between the contract and the total program. Again, I would say that a large portion of the total \$13 billion for the B-1 program is not yet under contract.

#### \$56 MILLION PER B-1 BOMBER

Chairman PROXMIRE. Can you estimate the program unit cost of B-1 using the new figures?

Mr. GUTMANN. Yes; we can; \$56 million is the unit cost.

Chairman PROXMIRE. \$56 million a plane?

Mr. GUTMANN. \$56 million a plane.

Chairman PROXMIRE. How many planes is that?

Mr. GUTMANN. It would be a total of 244 planes.

Chairman PROXMIRE. Does that include the works—missiles, spares, and so forth?

Mr. WOODITCH. No; there are some additional costs in there, but not that much.

Chairman PROXMIRE. Can we get a complete comprehensive overall unit cost, program cost, including everything?

Mr. WOODITCH. There is some logistics support/additional procurement cost of \$238.9 million.

Chairman PROXMIRE. And what would this mean on a unit basis?

Mr. WOODITCH. On a unit basis—

Chairman PROXMIRE. Would that mean another million dollars?

Mr. WOODITCH. Yes; roughly.

Chairman PROXMIRE. So \$56-\$57 million per copy. Is there any likelihood in your opinion that costs will go even higher on the B-1?

Mr. GUTMANN. We don't have a basis for speculating on that, Mr. Chairman.

Chairman PROXMIRE. What was the original program unit cost?

#### ORIGINAL B-1 COST ESTIMATE—\$35.8 MILLION

Mr. GUTMANN. The original was \$35.8 million.

Chairman PROXMIRE. So is it already to \$56 or \$57 million?

Mr. GUTMANN. Yes, sir.

#### MORE THAN \$11.9 BILLION FOR TRIDENT SUBMARINE PROGRAM

Chairman PROXMIRE. This may be the first \$100 million plane in history. I notice that your report gives cost figures for the Trident program, estimated at \$11.9 billion. How many subs are included in this estimate, and does the figure include the cost of the missiles and the nuclear warheads?

Mr. GUTMANN. It is the total program, Mr. Chairman.

Chairman PROXMIRE. It is the total program. And how many subs?  
Mr. GUTMANN. I think that is classified, Mr. Chairman.

Chairman PROXMIRE. The number of subs in the program is classified?

Mr. GUTMANN. Yes, sir. In fact, until recently the total cost of the program was classified, until a week or two ago.

Chairman PROXMIRE. We have had some debate on that on the floor of the Senate. It seems to me that came up on the floor. Maybe it is still classified. At any rate, the cost per sub has been variously estimated in the press as \$800 million to a billion dollars.

Mr. GUTMANN. Let me check, Mr. Chairman, and see if we have this unit cost declassified yet.

Chairman PROXMIRE. While you are looking that up, I understand that the total cost was previously estimated at about \$13½ billion—you are under that by a considerable amount. What is the difference? You say this is a total cost in this case, \$11.9 billion?

Mr. GUTMANN. I am advised that just recently the number of subs and the missiles has been declassified.

Chairman PROXMIRE. And how many are there?

Mr. GUTMANN. The information we have is that there are 10 subs and 320 missiles.

Chairman PROXMIRE. So that the unit cost would be around \$1,200 million, \$1,190 million. On your basis—and you are checking to see whether that program cost is final or whether it is higher—and while you are doing that, let me go ahead.

[The following information was subsequently supplied for the record:]

The \$11.9 billion is the Navy's estimate of the total program cost at June 30, 1973. Not included are the Navy's estimates for additional procurement costs of \$601 million and operating and maintenance costs of \$287 million supporting the acquisition program. Also not included are estimated costs for the propulsion system of \$257 million and the missile warhead costs which had not been identified at June 30, 1973.

#### SUGGESTED IMPROVEMENTS FOR REPORTING WEAPONS COSTS

Chairman PROXMIRE. I was very pleased to note your recommendations for improvements in the Pentagon's system for reporting weapons costs to Congress. As you know, I have been urging for some time that improvements be made both in the substance of the reports and in their timeliness. I must say that so far they have had only very limited usefulness mainly because we get them so late that the figures are outdated long before we see them. In addition, there are large gaps in the figures and they are therefore incomplete. You mention the fact the reports, called SAR's, often do not include an estimate of total production costs. Can you tell us some of the programs for which total production costs are not now provided to Congress through these reports?

Mr. GUTMANN. Here are some examples, Mr. Chairman, of cases where the SAR's did not include production costs, and included only R.D.T. & E. costs. One of them is the HLH—that only includes the cost estimates for the advanced technology component program. After this program is completed the service expects to be in a position to make a development and procurement estimate. We believe that there

should be a basis for making those estimates earlier, so that the Congress can have at least a range of figures with which to work as to the total cost of the program. The A-10 aircraft that was formerly the A-X was included on a SAR reporting system in December. The cost estimate was shown as \$84 million for the competitive prototype program only. It wasn't until June 1973 that the SAR showed a total program estimate of \$2.5 billion for the A-10. These are a few examples.

Chairman PROXMIRE. Give us as much as you can on that for the record.

Mr. GUTMANN. All right, sir.

[The following information was subsequently supplied for the record:]

Systems on SAR at June 30, 1973, that did not include any procurement costs in program estimates:

	<i>R.D.T. &amp; E. estimate (Millions)</i>
Army heavy lift helicopter.....	\$189.9
Navy Aegis missile system.....	484.1

Non-SAR systems identified by DOD as major acquisitions that did not include any procurement costs in program estimates:

	<i>R.D.T. &amp; E. estimate (Millions)</i>
Army site defense .....	\$850.0
Army tactical operations system.....	45.6
Navy surface effects ship.....	496.0
Navy encapsulated harpoon.....	44.3
Navy submarine launched cruise missile.....	909.2
Navy high energy laser.....	155.6
Air Force advance medium STOL transport.....	200.0
Air Force lightweight fighter.....	114.2

Chairman PROXMIRE. You mentioned that the cost of nuclear warheads had not been included in the total. And you pointed out that they are included in the footnotes. But I am talking now about the total figures that you give us on the overrun, and so forth.

Mr. STAATS. That is important, particularly when you add them up, and you want to get some overall judgment as to cost growth, that sort of thing should be included.

Chairman PROXMIRE. So they are not reflected in the figures of GAO's for the cost of major weapons systems?

Mr. GUTMANN. That is correct. And may I say that we are speaking here, of course, of the Department of Defense reports, the SAR's. And the problem here is that AEC costs are generally classified data.

Mr. STAATS. It wouldn't necessarily have to be broken out.

#### \$11.9 BILLION TRIDENT PROGRAM COST DOES NOT INCLUDE WARHEAD COSTS

Chairman PROXMIRE. How about on the Trident, does it apply to the Trident?

Mr. GUTMANN. No; it doesn't.

Chairman PROXMIRE. So this \$11.9 billion figure that you give us does not include the warheads?

Mr. GUTMANN. That is correct.

Chairman PROXMIRE. So it is incomplete. And may I explain that the rough estimate of over \$13 billion for the program is an independent estimate.

So any program with nuclear warheads has incomplete estimates?  
 Mr. GUTMANN. That is correct. I have here a list of those. The total program cost is \$46 billion, exclusive of AEC costs—for the SRAM, Minuteman, Lance, Safeguard, Poseidon, et cetera.

Chairman PROXMIRE. Can you estimate, or is it classified, the total nuclear warhead cost for all programs?

Mr. GUTMANN. I have no basis for making an estimate.

Chairman PROXMIRE. You do know if it is 1 or 50 or what?

I am going to have to go for a vote. I will be right back.

We will stand in recess for about 10 minutes.

[A short recess was taken.]

#### MORE ON THE B-1 BOMBER

Chairman PROXMIRE. When we left off, the question had been raised about this so-called \$100 million for the bomber. That was facetious reference by the chairman, but only half facetious. We see what has happened in the past. When will these B-1 bombers be fully in the inventory, roughly? What is the present estimate?

Mr. GUTMANN. December 1980 is the estimated initial operational capability.

Chairman PROXMIRE. And they still have systems, I understand, that haven't been developed or even invented yet. This is not something that is finished and settled and simply coming down the line? On the basis of all our past experience, and the inflation factor, I don't think \$100 million per copy is beyond imagination. But I didn't mean it, of course, as a firm figure based on estimates that we have from you or from anyone else.

#### CLASSIFIED COSTS

What about the problem of classified costs of weapons? Is the Pentagon still classifying weapon costs so that you have to show blanks in the spaces for the costs you report to Congress, and do you see any justification for classifying the costs of weapons?

Mr. STAATS. Let me comment in general, and then ask Mr. Gutmann to respond.

We have been successful in many cases in getting them to declassify information, once the issue is raised, and once the question has been raised at higher levels in the Defense Department. Our general policy with respect to all of our work is to make an effort to get the information declassified, because we think there is a great deal of information that is classified that doesn't need to be or is overclassified or the classification should be reduced.

Chairman PROXMIRE. Why do we have to have classification of costs of weapons? I can understand, of course, why we must have classification of any designs which are advantageous to us and which would be advantageous to a possible adversary, if they should get them. But why should costs be classified? What is the justification for that? How can an enemy react to their benefit on the basis of our disclosing the costs?

Mr. GUTMANN. The total costs now, Mr. Chairman, are generally being declassified.

Chairman PROXMIRE. Why shouldn't they all be declassified?

Mr. GUTMANN. I think they should be. And by and large they now are. The declassification comes primarily when there is a need to safeguard the numbers of a particular type of system that are being procured. And if the total cost is available, and unit costs are available, numbers of the weapons systems being procured are obviously also available. So this is the reason that although we are now getting total costs, we still have situations where we cannot get numbers of units.

Chairman PROXMIRE. For which weapons are costs presently classified?

Mr. GUTMANN. None of those on which we are reporting are now classified with respect to total costs.

Chairman PROXMIRE. Do you know whether there are any weapon programs for which not only the costs but even the names of the programs are considered classified, or do you know whether any such supersecret projects are being pursued at the present time?

Mr. GUTMANN. That is pretty supersecret. We don't know about it.

Chairman PROXMIRE. You should have at least enough control over the budget to know if we are missing a few billion dollars. Maybe we don't.

Mr. GUTMANN. I'm sure that agencies do. There are some highly classified activities that involve procurement of hardware. We are considering just how much, if any, audit work may be possible in those areas. But it is for the future.

Chairman PROXMIRE. Do you have any estimate at all as to how much money would be involved in supersecret projects?

Mr. GUTMANN. No, sir. I think part of the problem is that the money comes from many different sources. I am in an area now where we really have not done a lot of work.

Chairman PROXMIRE. Could there be as much as \$1 billion here involved?

Mr. GUTMANN. I have no way of knowing.

#### MORE USE OF PROGRAM UNIT COST IN GAO REPORTS

Chairman PROXMIRE. Would it be possible for your reports on weapon programs to show, in the future, the program unit costs for each weapon where the number of units being procured has been made public? I understand that in some cases numbers of weapons are considered classified and properly so, but in many cases the numbers are known—such as the LHA, DE-963, C-5A, and many others—and it would be extremely helpful to see a breakout for the unit costs as well as the total program costs.

Mr. GUTMANN. Yes; that would be possible for us to do where the number of units is not classified information.

Chairman PROXMIRE. It would also be helpful to have some idea, in GAO's reports to have the facts about delivery schedules and technical performance, to whatever extent is feasible. Presently we get practically no information about these aspects of weapon programs. Again, I am referring to the summary reports. I realize that some of this information is contained in staff studies on individual systems. But as you know, many of these are classified, and for those that are not it would be useful to have all the available information summarized in your semiannual reports. Can this be done?

Mr. STAATS. What you are suggesting is that the information that is unclassified be put in to the extent practical into our annual report, or the semiannual report, as it will now be.

Chairman PROXMIRE. That is correct.

Mr. STAATS. We have been carrying that information in the staff studies, some of which are unclassified. But you are quite correct in saying that a great many of them are classified in nature.

#### DELIVERY SCHEDULE AND PERFORMANCE INFORMATION IN GAO REPORTS

Chairman PROXMIRE. It seems that most of that kind of information we seem to lack, on delivery schedule and performance.

Mr. STAATS. This was our original intent, going back to 1969, when we started this program, which was to put as much of this kind of information in our reports, but we will take another look at it, Mr. Chairman, to see if there is information of this type that could be included that is not now included.

Mr. GUTMANN. I might add, Mr. Chairman, that certainly we can add to our annual report some performance and schedule information that is not classified. But as you point out, if it is not classified, it already appears in a staff study that in itself is not classified. Congress already has it in an unclassified staff study of weapons systems.

Chairman PROXMIRE. But it is not pulled together?

Mr. GUTMANN. It is not pulled together.

Chairman PROXMIRE. If you have it in one place it can be very helpful to us. It is hard to evaluate the costs. The overruns seem to be under a little better control. But when you find that the delivery dates are late, and stretched out, and that the performance is worse, you might or might not have an improved picture.

Mr. GUTMANN. We can take a look at that and see what we can do. It could be quite a significant undertaking. And obviously we would not then be able to meet the date of May and November, which is slightly over 90 days after the date of the report, and less than 15 days after we get the information from the Department.

Chairman PROXMIRE. After all, the delivery schedule shouldn't be a very onerous thing to put together if the information is there.

Mr. STAATS. It might be useful to have this even though this came at a later point of time than the financial information.

#### INVENTORY OF WEAPONS SYSTEMS BEING PROCURED

Chairman PROXMIRE. Both GAO and Congress have had a difficult time obtaining a complete inventory of all major weapon systems being procured. Can you tell us what progress has been made on this problem?

When we ask for the overall overruns we are always told, well, this is the best we can do, there are some major weapons systems that are not included.

Mr. GUTMANN. The Department of Defense just recently has developed an inventory showing costs of a total of 104 weapons systems. This information comes from the Office of the Assistant Secretary of Defense (Comptroller), dated November 1.

Chairman PROXMIRE. How many weapons systems did you say?

Mr. GUTMANN. 104.

Chairman PROXMIRE. We have 116 weapons systems we put in the Congressional Record last December.

Mr. GUTMANN. We have not reconciled it to tell which ones have been added or deleted.

Chairman PROXMIRE. That is the problem, you see, they add them and drop them, and they disappear, and they appear, and we should understand why there is this change. Maybe it is legitimate to have that much variation.

Mr. STAATS. We make that same point in our testimony here this morning, that they should stick with it once it's in the report and carry it on through to completion.

#### NAVY LAX ON USING SHOULD-COST STUDIES

Chairman PROXMIRE. I am very glad to see that you have completed the assessments of the Pentagon's should-cost efforts. You have now given us reports for each of the three services and they will be made a part of the record.<sup>1</sup> In your prepared statement you indicated that progress has been made, except with regard to the Navy which still refuses to do much with this proven technique for reducing costs. But in looking at the figures in the reports you have submitted, what is identified as savings or potential savings are reductions in the price proposals of the contractors. How can we be sure that the price proposals weren't inflated in the first place so that the lowered price would seem to show a reduction when in fact it does not represent a real reduction?

Mr. STAATS. Here you have the problem of sorting out the basis for the cost estimate in the beginning. We know of no way that you can isolate out each of those factors with any degree of precision. There are other factors besides those factors which relate to should-cost studies, as you know. We would like to be able to make precise estimates as to what the flow from each of these recommendations is. But we are doubtful that we will be able to develop those with such a degree of precision or quantify them even, in many cases, to have them be meaningful.

#### CAN SHOULD-COST GET THE FAT OUT

Chairman PROXMIRE. Let me give you an example.

In some of the cases in the study,<sup>2</sup> released by the subcommittee on Monday, costs of negotiated contracts were reduced as much as 75 percent after competition was allowed in. Now, on such programs had the prices been reduced by only 25 percent your assessment would show that as a savings. Isn't there some way that levels of inefficiency or fat in contracts can be quantified by the should-cost method so that a determination can be made as to whether final prices represent real or phony savings?

Mr. STAATS. Of course, the kind of padding that you are concerned about here, and I guess all of use are concerned about, could take place with or without should-cost studies. Now, one of the features of should-cost studies is that you can get behind any such padding easier than

<sup>1</sup> See attachment II, beginning on p. 2554.

<sup>2</sup> See study entitled "The General Advantages of Competitive Procurement Over Sole Source Negotiation in the Defense Department," beginning on p. 2598.

if you didn't conduct them. I think that is part of our view of the matter.

Mr. Gutmann or Mr. Morris may want to add to that.

Mr. MORRIS. I might just stress, Mr. Chairman—

Chairman PROXMIRE. Let me interrupt to say that we are concerned that the services are not doing this with the drive, the purpose of getting behind the fat and puffed-up, unjustified cost estimates.

Mr. MORRIS. We think that the should-cost method is especially valuable in the case of sole source procurements or captive companies that don't have the pressures of competition, such as the report on Monday did bring out. And it is in this area that we wanted to encourage much more extensive use of should-cost as a part of the preparation for negotiations, so that you have cards to put on the table as you negotiate the price.

Mr. STAATS. The other point that we think needs to be stressed is that on the Government site many times in the should-cost type of review the Government can make revisions either on schedules or on performance, or other situations which would reduce the cost of that end item.

#### SHOULD-COST METHODOLOGY NEEDS IMPROVEMENT

Chairman PROXMIRE. We want to be very careful that the should-cost concept itself doesn't deteriorate, that it is a careful and comprehensive, expert, responsible, honest estimate of what the program should cost, should indeed cost. We are not at all satisfied that the should-cost studies have been that.

Mr. STAATS. We agree with you. I think without the support that this committee has given we probably wouldn't be having many, if any, of these types of studies today. It needs to be encouraged and pressed. The point I recall making, Mr. Chairman, on the first presentation on this subject to the committee, going back sometime ago, is that we believe that the more in-house capability they can develop to perform these studies, the better off they are going to be, rather than contracting out. Now, consultants on specific problems can be very useful. But without the in-house capability they don't get the value of having a should-cost team review contracts in different kinds of situations, where they can carry over the experience learned in one case to make it apply to another case. We think this is an important point which we would hope that you might also develop in your hearings with the services.

Chairman PROXMIRE. I have been very demanding on your office, and you have been marvelous in your response, very helpful to us. I am going to ask for something more now.

#### SHOULD-COST VERSUS WILL-COST

Would you consider directing your staff to conduct a series of should-cost studies of major weapons systems, of the type I have in mind, so that we could see quantified should-cost data compared with will-cost data? If you are agreeable to such a project I would like your staff to get together with my staff so the details can be worked out.

Mr. STAATS. We made some in the beginning, but at the time we reported back here on whether it was feasible or useful to make studies. I believe we did studies of five companies. We did this with the co-

operation of those companies. We had no legal access to their information. But it was from those studies where we did document the savings that we came to the conclusion that we should go ahead with a program in this area. We would be glad to explore with you on this to see what further work we might put into our program. But basically I think you would agree that this ought to be done in the contracting agencies.

Chairman PROXMIRE. Yes, but it would be very helpful to have at least some spot should-cost studies made by you.

Mr. STAATS. We would be glad to do that.

OFFICE OF FEDERAL PROCUREMENT POLICY—NOT UNDER WHITE HOUSE  
AND OMB CONTROL

Chairman PROXMIRE. I appreciate your interest in the proposed Office of Federal Procurement Policy, and I support setting up some mechanism for coordinating policy and for changes that are required. One concern, I have, however, is for independence of such an office. It seems to me that if the office is placed in the executive branch it will be under the control of the White House or OMB—and I am not sure that that would be a good idea. Do you agree that the new office should be free of the pressure that the military and its contractors will attempt to exert on it?

Mr. STENNIS. Yes.

Chairman PROXMIRE. What feeling do you have about making it—

NOT EVEN THE PRESIDENT CAN MAKE DIRECTIVES CONCERNING DEFENSE  
DEPARTMENT PROCUREMENT POLICIES

Mr. STAATS. The reason that it is important to have legislation in this area is partly for the reason that you have just indicated. We think that there needs to be greater accountability to the Congress. We think whoever heads it up should be confirmed by the Senate. The importance of having a point here, though, which is recognized as having authority, is underscored also by the fact that under present law the Defense Department makes its own regulations as final authority, and there is no authority in anyone else, including the President of the United States, to issue any directives to the Defense Department with respect to procurement policy.

Chairman PROXMIRE. No authority in the President of the United States, the Commander in Chief?

Mr. STAATS. No, sir. The President could always remove the Secretary of Defense. I am not suggesting that Defense would not adhere to the President's directive—but the statute today literally places the Defense Department in charge.

Chairman PROXMIRE. How, as a matter of practicality, has this operated under the past two or three Presidents?

Mr. STAATS. I'm afraid pretty much that way.

Chairman PROXMIRE. The Defense Department has had autonomy?

Mr. STAATS. That is right. There has been no one concerned on a continuing full-time basis in the central level.

We can supply the citations for the record. The 1949 statute gave the President the right to do this. But independent authority was given to the Defense Department in 1952.

Chairman PROXMIRE. Then, do you think it might have a substantive effect if we give the President that authority, or that it would continue simply as it is?

Mr. STAATS. I think it would have a substantive effect. I think if Congress enacted legislation this would be very determining, very controlling.

Chairman PROXMIRE. Do you know any other agencies of the Federal Government other than, of course, the independent agencies such as the Federal Reserve Board and the quasi-judicial agencies—do you know of any other strictly executive agencies in the Defense Department that are outside the jurisdiction of the President by statute?

Mr. STAATS. No, sir. The Federal Reserve Board obviously is.

Chairman PROXMIRE. This is a different thing, they are independent because the Constitution gives the money power to the Congress, and we created the Federal Reserve Board independently of the President. The President doesn't have the money power, Congress does, and its creature, the Federal Reserve Board does. But you can't apply that to the Defense Department. If there is any agency that is peculiarly subject to the Commander in Chief, it ought to be the Defense Department, and subject to the President's authority as Commander in Chief, strictly in the executive department. They have no judicial functions, and no independent constitutional functions.

Mr. STAATS. The reference here is 10 U.S.C. 2202. We will supply the full text of that for the record.

[The following information was subsequently supplied for the record:]

10 U.S.C. 2202 was originally enacted in 1952 and reads as follows :

"§ 2202. Obligation of funds : limitation

"Notwithstanding any other provision of law, an officer or agency of the Department of Defense may obligate funds for procuring, producing, warehousing, or distributing supplies, or for related functions of supply management, only under regulations prescribed by the Secretary of Defense. The purpose of this section is to achieve the efficient, economical, and practical operation of an integrated supply system to meet the needs of the military departments without duplicate or overlapping operations or functions."

10 U.S.C. 121 authorizes the President to issue regulations concerning DOD activities as a whole. Also, the Secretary of Defense is subject generally to the President's direction as a subordinate official in the executive branch. However, the absolute terms of the language quoted above give the Secretary of Defense authority with respect to procurement regulation issuance which is not subject to Presidential direction. This section is cited in the Foreword of the 1973 edition of the Armed Services Procurement Regulation as the statutory authorization for that regulation. The language of 10 U.S.C. 2202 may be contrasted with the regulation issuance authority provided the Administrator of GSA under the Federal Property and Administrative Services Act of 1949, which is generally subject to the President's direction.

Also, in 1965, Title III of the Federal Property and Administrative Services Act was amended to make procurement by civilian executive agencies subject to the procurement procedures required by Title III and to provide for issuance of implementing regulations by the Administrator of GSA. See 41 U.S.C. 252(a). (Prior to this time Title III had been applicable to civilian executive agencies only by permissive delegation from the GSA Administrator: had exempted DOD agencies, NASA and the Coast Guard from GSA delegation authority; and had not provided the GSA Administrator with separate regulation issuance authority with respect to procurement procedures.) This amendment, however, exempted DOD, NASA and the Coast Guard from the mandatory application of its provisions, including the newly added authority of the Administrator to issue implementing regulations. Thus, with respect to Title III procurement procedures, DOD acts independently of the Federal Property and Administrative Services Act.

Mr. STAATS. Mr. Chairman, in addition to this, this is expensive from another standpoint. And that is that, for industry itself, and for the contracting agencies, many of the regulations and the statutes which apply are different for no reason other than that they were enacted that way 20, 30, or 40 or 50 years ago, 100 years ago in some cases, and there has been no modernization effort really made in this field.

Chairman PROXMIRE. I think that is right. And you are aiming at one part of it, and with complete justification, and I applaud it and support it. I am talking about one other facet of this, however, and that is making this proposed Office of Federal Procurement Policy independent of the OMB, and of the Defense Department, so that it could—

Mr. STAATS. Set up as a separate regulatory body?

Chairman PROXMIRE. That is exactly right; yes.

CAN THE PROCUREMENT COMMISSION BE INDEPENDENT OF THE PRESIDENT'S CONTROL?

Mr. STAATS. Well, we discussed this possibility in the Procurement Commission and the consensus was against it on the ground that the procurement is so intimately related to budget and legislation that it would be very difficult to have a regulatory body which is completely independent of the President.

Chairman PROXMIRE. Let me put it another way. What we are mainly concerned about is the undue influence of the military and the contractors. Is there a way, do you think, that it could be insulated from that while within the executive department?

I think you make a good point, that constitutionally it is very hard to put it outside the executive.

Mr. STAATS. I think the greatest protection against that would be to provide for some way in which that body could be brought before the Congress on some regular basis and held accountable for its actions. This committee, to be quite candid about it, has no central place to turn to in the executive branch to justify and to support and to defend what has been done. And that is why you have to call before you several different agencies without any point which you can hold centrally accountable for the reasons why those actions haven't been taken.

Let me give you another illustration—

Chairman PROXMIRE. Are you talking about the Navy, the Army, the Air Force, as well as NASA, GSA, and so forth?

Mr. STAATS. I can give you another illustration of what kind of thing can happen. The Defense Department follows one buy America policy and the rest of the Government follows a different policy. And there is no one that really pays enough attention to this to know why that is being done, except for the fact that Secretary McNamara decided one day that he wanted one policy, and the rest of the agencies didn't like it, and they didn't go along with it, and that was the way it developed.

STRUCTURE OF OFFICE OF FEDERAL PROCUREMENT POLICY

Chairman PROXMIRE. Shouldn't we also be concerned with the structure and the makeup of the new office? What if the President nominated, under one of the current proposals, persons to head it up who

were biased in the direction of no controls over contractors, and those persons in turn hired staff with similar biases. Wouldn't that be a setback to those of us who are trying to improve procurement policy and save the taxpayers money?

Mr. STAATS. You shouldn't confirm under those circumstances.

Chairman PROXMIRE. He should be sent for confirmation?

Mr. STAATS. I think I would go along with that.

Chairman PROXMIRE. Why not have an office structured somewhat like the Cost Accounting Standards Board, which is located in the legislative branch, or an office whose leadership was chosen partly by the President and partly by Congress?

Mr. STAATS. We think that you have in the General Accounting Office an arm of the Congress concerned with procurement. And, as you know, that is one of the reasons we set up a separate Division in GAO which we call the Division of Procurement and Systems Acquisition, to look at procurement and systems acquisition Governmentwide. Mr. Gutmann is the head of that Division. And Mr. Morris has general surveillance over that.

Chairman PROXMIRE. But you only investigate it, you don't make policies.

Mr. STAATS. That is right. The new Office also makes policies, as I understand it—all it can do is make recommendations and provide for disclosure of policy problems. But we don't have any directive powers. We doubt if it would be feasible to have directive powers in an agency of the legislative branch here, for constitutional reasons, among others. The Cost Accounting Standards Board is a different proposition, although there are some who challenge that, on the ground that that is an executive function. But the difference is that in the CASB we are promulgating general principles and standards which apply, and which become incorporated by law into the procurement regulations. And we do not get into actions involving individual contract organizations or an individual weapons program.

#### MORE ON THE BUILD AND CHARTER PROGRAM

Chairman PROXMIRE. I would like to spend just a very few minutes, before we are through, on the build and charter program.

Are you satisfied that the recent lease agreement for Navy tankers represents a good deal for the taxpayer? Are we paying more or less for tankers with this arrangement than we would if they were purchased outright?

I think that your conclusion is that it depends on the discount factor.

Mr. STAATS. It does.

Chairman PROXMIRE. The way you put the discount factor, I think you are wrong, as I interpret the conclusion—and when I say that you are wrong, I think that the 6-percent discount factor is inadequate. The 10-percent discount factor is much more realistic. As a matter of fact, I think you could justify a 12-percent discount factor, given present interest rates and the opportunity cost of money.

Mr. STAATS. Well, there are several things involved. The reason that we said what we have here is that the policy of the executive branch today results in a 6-percent rate. They did not follow that policy. And it would have made a difference—

Chairman PROXMIRE. I think you are absolutely right; it is inconsistent, but I think the policy itself is mistaken.

Mr. STAATS. Here again, no one is really in charge of the store in the sense of leadership on policy matters of this type. We have been explaining about the discount rate issue for several years, as you know. We would agree with you that 6 percent alone is too low. What we suggested before this committee some time back was to take the long-term yield rate and put the Federal income taxes forgone on top of that, which gets to about 10 percent. But that is a separate question from the one that we were dealing with here. There is another issue—

Chairman PROXMIRE. It is not entirely a separate question, though. You say that if you used the 10-percent discount factor the decision made saves money?

Mr. STAATS. That is right.

Chairman PROXMIRE. If you use a 6-percent factor it does not. My conclusion would be that 10-percent factor is a justifiable factor, given present interest rates and so forth, and the return on capital in the private sector, that their decision was justifiable.

Mr. STAATS. Well, if they wanted to violate the rules—

Chairman PROXMIRE. You are right, from the standpoint of the rule, it is inconsistent—but from the standpoint of whether this was a way to invest your money, it seems to me it makes sense.

Mr. STAATS. You are correct in that. But the other consideration here is that normally the way that you would do this would be to go through the front door and get an appropriation for it—and if in this case they used operation and maintenance funds in kind of a roundabout way to acquire something which normally would have been acquired in a different way. We don't think Congress really has a full opportunity to consider the merit of the case or the need of the program itself.

Chairman PROXMIRE. So it is a way of getting around a decision of the Congress as to whether to go ahead and make a substantial capital acquisition, Congress never had that option.

Mr. STAATS. That is correct.

Chairman PROXMIRE. They just did it on the basis of using their operating funds.

You say, I take it, that you think 6 percent is the legal way to proceed, the discount factor of 6 percent, but that 10 percent perhaps could be better justified on the basis of economic factors.

Mr. STAATS. We don't quarrel with the higher discount rate.

Chairman PROXMIRE. What actually happened as a practical matter is that by going through the lease procedure the Navy was able to avoid congressional control, and all they had to do with a lease procedure was simply to talk to some committee staff members before going ahead with the deal, is that right, whereas otherwise they would have had to have had a formal appropriation through the Appropriations Committee, through the House and through the Senate, and so forth?

Mr. STAATS. That is correct.

If the decision had been made, then they would have had to have had an authorization as well.

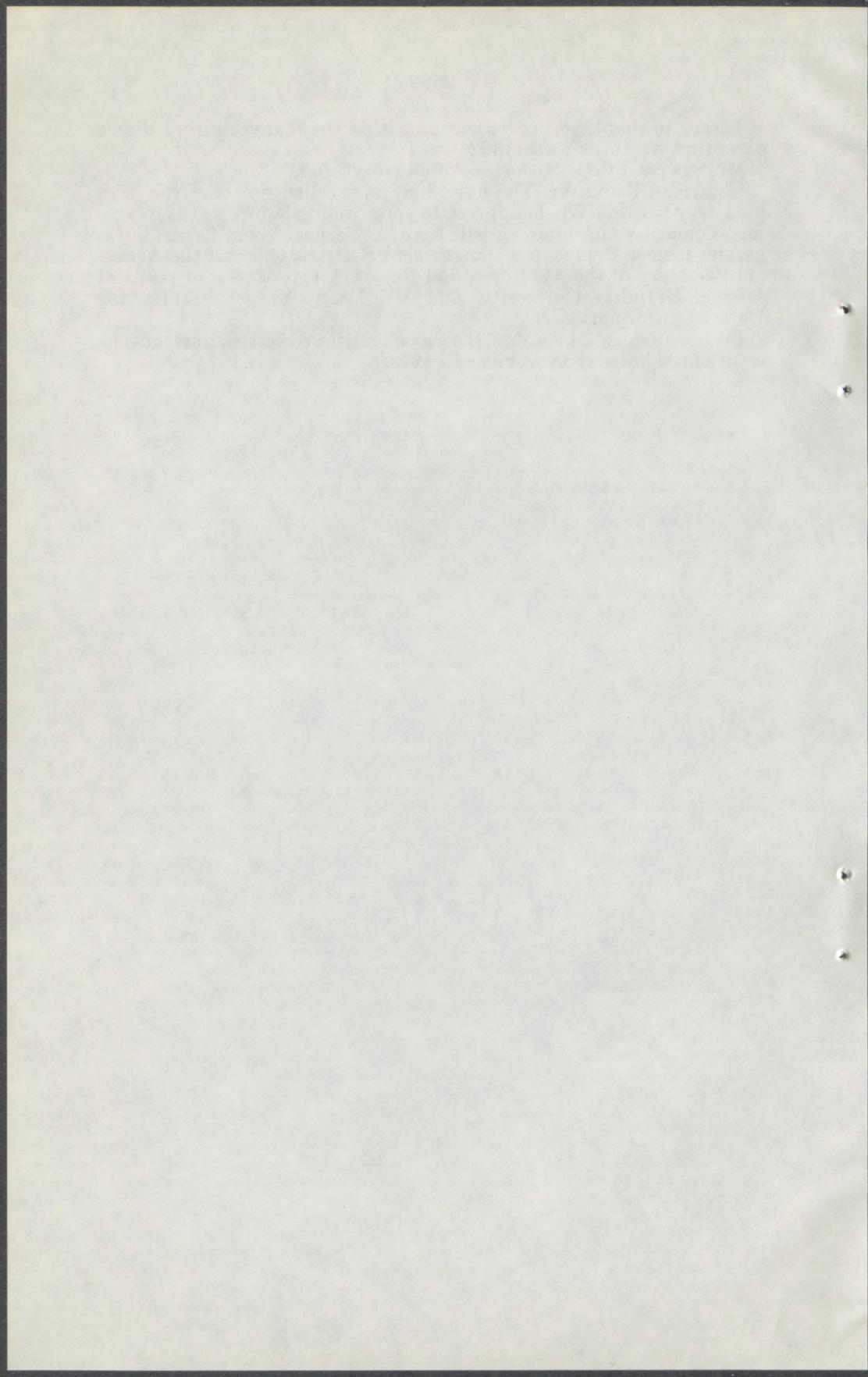
Chairman PROXMIRE. I might say that I am in the process of preparing legislation on that subject which I hope to introduce in the near future.

I want to thank you very, very much. Is there anything we didn't cover that you think we should?

Mr. STAATS. I think we have covered everything.

Chairman PROXMIRE. You have done an excellent job, and you have been very helpful. We do appreciate your coming before us this morning. Tomorrow morning we will have in the same room Ernest Fitzgerald, former Deputy for Management Systems, Office of the Assistant Secretary of the Air Force, and Robert Art, professor of political science, Brandeis University, and Mr. Larry Yuspeh, Center for Defense Information.

[Whereupon, at 11:55 a.m., the subcommittee recessed, to reconvene at 10 a.m., Thursday, November 15, 1973.]



# THE ACQUISITION OF WEAPONS SYSTEMS

THURSDAY, NOVEMBER 15, 1973

CONGRESS OF THE UNITED STATES,  
SUBCOMMITTEE ON PRIORITIES AND  
ECONOMY IN GOVERNMENT OF THE  
JOINT ECONOMIC COMMITTEE,  
*Washington, D.C.*

The subcommittee met, pursuant to recess, at 10:05 a.m., in room S-407, the Capitol, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard F. Kaufman, professional staff member; Michael J. Runde, administrative assistant; and Walter B. Laessig, minority counsel.

## OPENING STATEMENT OF CHAIRMAN PROXMIRE

Chairman PROXMIRE. The subcommittee will come to order.

I do not know what there is about the appointment of a Secretary of Defense, but whether it is a Democrat or Republican President, it seems that the first thing that the President does is equip a Secretary of Defense with what is known as a fun house mirror. You know those mirrors that they have in fun houses, if you are thin they make you look fat, and if you are fat they make you look thin. Apparently they always get one for the Secretary of Defense, so that no matter how fat the Defense Department is, it makes it look thin.

A few months ago, on the eve of the debate over this year's military bill, Defense Secretary James R. Schlesinger chastised the critics of excessive defense spending by saying: "It is an enchanting illusion that you can simply take large amounts out of the defense budget and get only fat and not muscle."

Year after year Presidents and Pentagon spokesmen assure Congress and the public that the defense budget is a bare bones minimum request without an ounce of fat. For the past several years Congress has been able to identify large quantities of fat in defense and we have been moderately successful in reducing it. But somehow that fun house mirror that the Pentagon secretaries have will not enable them to see the reality.

Anyone who believes we are getting our tax dollars' worth out of military spending is the real victim of enchanting illusions. This is especially so in the area of defense procurement.

About half the dollars that go into procurement end up in the hands of subcontractors. The relationship between prime contractors and subcontractors receives only the most cursory attention from the

(2591)

Pentagon. The potential for waste and corruption in this area alone is very large, as we learned yesterday.

Problems of gold plating on major weapon systems, poor performance, late deliveries, cost overruns and high profits are far from illusory. They are real and they add up to an enormous waste of tax dollars and national resources.

The military man is, figuratively speaking, a fat man. He would be happier, healthier and more effective, and the rest of us would be better off if he would only trim down.

Our witnesses this morning have each attacked the problem of procurement excesses from different perspectives. Their prepared statements are highly original and provocative analyses of defense contracting.

Robert Art, professor of political science at Brandeis University; A. E. Fitzgerald, formerly the Deputy for Management Systems, Office of the Assistant Secretary of the Air Force; and Larry Yuspeh of the Center for Defense Information. The Subcommittee on Priorities and Economy in Government welcomes you to these hearings.

I understand that in view of the nature of your prepared statements the best order would be Mr. Yuspeh first, and then Mr. Fitzgerald, and then Mr. Art.

Mr. Yuspeh, I might say that in view of your detailed study, the entire study, including the very helpful tables, will be printed in full in the record.

I would appreciate it if you gentlemen could confine your opening remarks if possible to 10 or 15 minutes. It would be very helpful to the subcommittee if you could do that.

Mr. Yuspeh, go right ahead.

#### STATEMENT OF LARRY YUSPEH, STAFF ASSOCIATE, CENTER FOR DEFENSE INFORMATION

Mr. YUSPEH. The size of the Federal budget is a prime concern for those who worry about inflation in our shaky economy. If Government expenditures are high, aggregate demand may outrun output by such a large factor that runaway prices could be with us for a long time.

##### EFFICIENT PROCUREMENT CRUCIAL FOR SAVING TAX DOLLARS

Since military and related outlays compose a large part of the Federal budget and an even larger part of its controllable shares, it is apparent that one of the primary ways to stabilize these expenditures is to impose stiff controls on military spending. Many people have suggested areas of the defense budget that could be cut. Specifically, the necessity and wisdom of individual weapons systems have often been questioned. Few, however, have analyzed generally accepted procurement policies in the Department of Defense. If these policies were more efficient, reductions in military expenditures would be far reaching. Not only would dollar savings be great, but efficiency arguments also avoid the irreconcilable disarmament problems that accompany calls for a reduction in weapon system procurement. DOD could have its weapons systems and the efficiency minded could have their budget cuts. Efficiency combined with the discontinuation of unneeded weapons sys-

tems would surely be best. But if a choice between the two had to be made, efficiency would get mine, since it provides savings for procurement of all systems, not just a few. In this way all could live together in a state of fiscal détente.

My study, therefore, focuses on a specific area of Defense Department procurement policy. Through use of the case study method, my investigation determines the effect on unit price and learning curve slope of a change from sole source to competitive procurement. I will review the conclusions that may be culled from the 20 case studies. We will look at the price reductions experienced in some of them. And last, I will suggest a policy approach that Congress might use to scrutinize the way material is procured at DOD.

### THREE REASONS WHY COMPETITION SHOULD BE USED MORE OFTEN

The case studies refute three prime arguments that the Department of Defense uses against implementing competitive procurement. The first one says that competition is almost impossible for procuring electronics, missile, and other sophisticated weapons and equipment. But several cases involve competitive procurement of just the material that DOD says cannot be purchased that way. Complex and expensive electronics like the TD-204 cable combiner, the TD-202 radio combiner, the TD-352 and TD-660 multiplexer, and the 60-6402 electric control were all purchased competitively and showed significant price reductions due to the use of competition. The same is true for the procurement of the Standard 66-A and 67-A missiles, the Shillelagh, Talos, and Hawk missiles. These examples indicate that competition is both a feasible and desirable procurement method for purchasing technologically complex equipment.

The military also argues that only marginal producers are interested in the low profit business of competitive procurement, which would result in poor quality goods for DOD and possibly higher than normal prices. But the cases reject this assertion. Competition winners include such large and prominent corporations as Honeywell, Maxson, Hazeltine, Bendix, and General Dynamics. None of this group is a marginal producer. It appears, then, that top quality manufacturers want the Defense Department's business regardless of the way DOD buys from them.

The last of the Defense Department's basic arguments says that competition takes too long in times of emergency. Many of the cases involved procurement of equipment during the war in Vietnam, which certainly could be characterized as an emergency. The AN/SQS23 208A transducer, the TD-204, and the TD-352, Talos, Shillelagh and Standard missiles, were all competed during the Vietnamese conflict. Here is convincing evidence that competition can be used effectively even in times of severe emergency.

### PRICE REDUCTIONS RESULT FROM SHIFT FROM SOLE SOURCE TO COMPETITIVE

Beyond refuting these three arguments, the cases generated a few conclusions of their own. The basic hypothesis that derives from them is that when the procurement method is changed from sole source to competitive, notable price reductions occur, but will be accompanied

by a flattening of the learning curve. All of the cases showed an average unit price reduction of some 51 percent, which easily offsets the flattening behavior. Savings from competition would remain great in those cases, even assuming prices would decline along the learning curve of the sole source purchases.

Now, it would be helpful to review the price reductions experienced in a few of the cases. Two bar graphs showing them appear here. For each, the sole source and competitive contractors are listed. And next to the respective company name is a bar representing its production unit price. The actual unit price data are written beside the bars. Following the graph I will review the percent savings experienced in the chosen cases. Both of the complete graphs will be submitted for the record.

Our first example is a Standard RIM 66-A missile. Sole source contractor, General Dynamics. Unit price, \$149,766. Competitive contractor, General Dynamics. Unit price, \$60,230. Percent reduction, 60 percent.

The Standard ER RIM 67-A missile. Sole source contractor, General Dynamics. Units price, \$149,766. Competitive contractor, General Dynamics. Unit price, \$61,039. Percent reduction, 59 percent.

On the next graph we have a few more cases.

Chairman PROXMIRE. Do you want that graph moved out?

Mr. YUSPEH. Yes, please.

One case, the TD-352 multiplexer, the sole source producer was Raytheon. Unit price, \$10,269.

Chairman PROXMIRE. Which one is that, the third one?

Mr. YUSPEH. The TD-352 is the fourth one from the top.

Chairman PROXMIRE. I see.

Mr. YUSPEH. The TR-352 multiplexer. Sole source producer, Raytheon. Unit price, \$10,269. Competitive producer, Honeywell. Unit price, \$4,291. Percent reduction, 58 percent.

The next case is the Mark 48 torpedo. And within this one we have four systems. You see that one near the bottom. On the first, the warhead, the sole source producer was Delco at \$11,019. The competitive producer was Goodyear-Aerospace, at \$5,078. Percent reduction 54 percent.

Next, the Exploder. Sole source producer, Delco, at \$5,800. Competitive producer, Goodyear-Aerospace at \$5,165. Percent reduction, 80 percent.

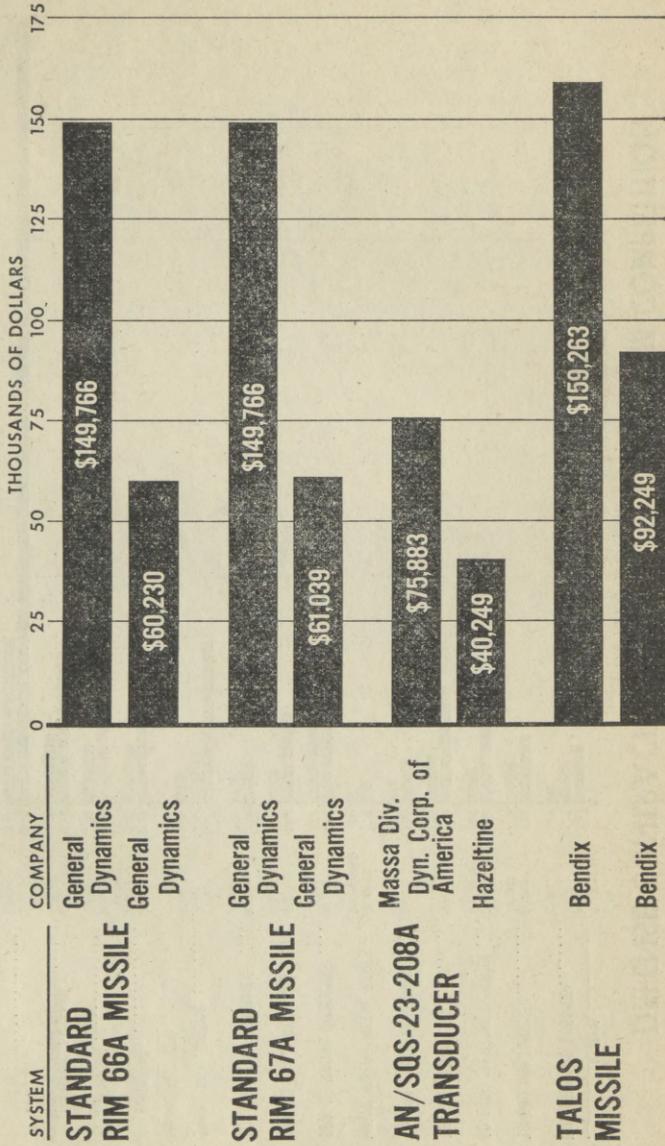
The electric assembly, sole source producer, Delco, at \$13,356. Competitive producer, Goodyear-Aerospace, at \$6,027. Percent reduction, 55 percent.

And the test site, sole source producer, Delco, at \$69,525. Competitive producer, Goodyear-Aerospace, at \$14,717, a 79-percent reduction.

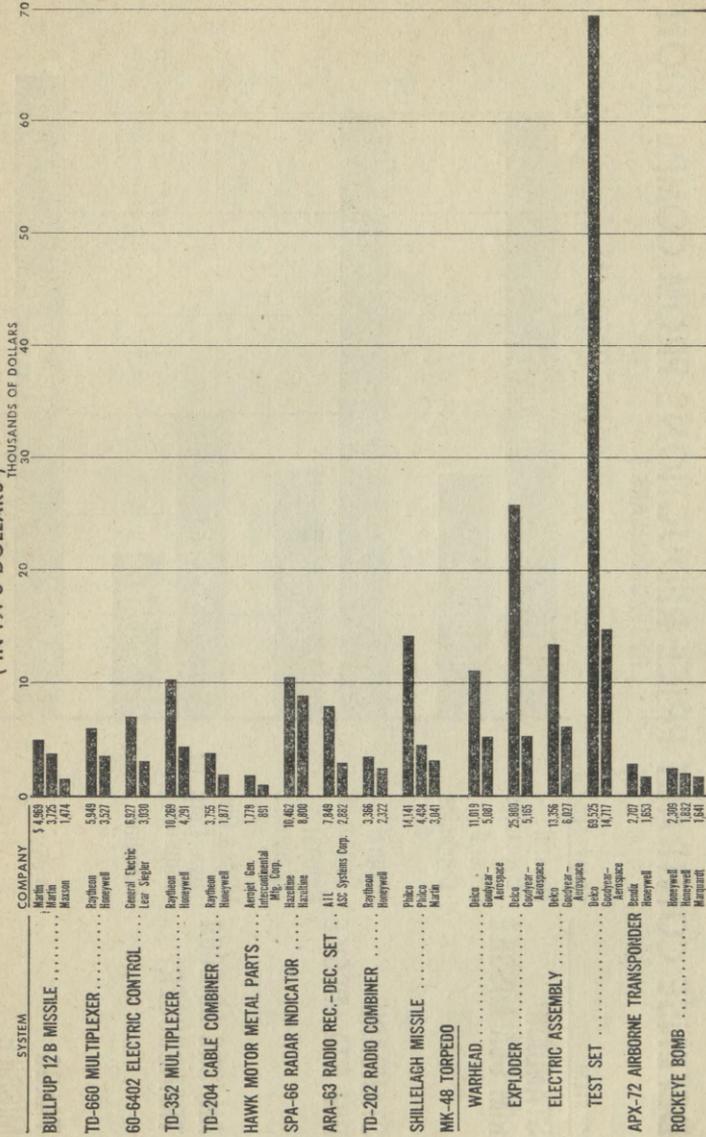
And the last example is the Rockeye bomb. Sole source producer was Honeywell at \$2,309. And there were two competitive producers, since there was a decision to have a learning buy. And the first was Honeywell at a unit price at \$1,882 and the second, Marquardt, at \$1,641. And for Honeywell, there was a 19-percent reduction, and for Marquardt there was a 29-percent reduction due to competition.

[The graphs referred to above follow:]

# DEFENSE CONTRACT PRICE REDUCTIONS FROM COMPETITION ( IN 1970 DOLLARS )



# DEFENSE CONTRACT PRICE REDUCTIONS FROM COMPETITION ( IN 1970 DOLLARS )



## WINNER-TAKE-ALL COMPETITION GIVES GREATEST SAVINGS

Mr. YUSPEH. Two other points may also be culled from the case studies. The Bullpup 12-B missile case shows us that DOD experiences some price economies when a learning buy is used. But maximum reductions are experienced only after winner-take-all competition is activated. In this case, unit price fell when the Bullpup was procured competitively from both Maxson and Martin, but it fell most dramatically once the decision to award Maxson all of the production on a competitive basis.

This case and the Shillelagh missile one may point out another conclusion. By competing the weapon on each successive buy after the decision to go competitive, the sole source company was forced to maintain a steep learning curve in order to hold its share of the market. In this way, assuming DOD needs two production sources, it could experience large unit price reductions and also avoid the flattening of the learning curve that usually accompanies the change in the procurement method.

SOLE SOURCE NEGOTIATION SHOULD BE USED ONLY AFTER CAREFUL  
CONGRESSIONAL SCRUTINY

Now that we have reviewed the study's conclusions we should look to the study's policy implications. It is obvious that competition gives significant price reductions in comparison to the unit prices achieved from sole source negotiation. And since it is possible to use some form of competitive procurement for many systems, no excuse for not using it should be accepted, unless solid reasoning against its implementation has been established.

Congress should, therefore, have some way to determine whether or not DOD's decision to negotiate an item is valid. I suggest that a basic form asking several questions about procurement be filled out by the Defense Department, that would be reviewed by Congress along its regular procurement request. The form could include questions like these: How many possible reliable producers exist? Justify your response by explaining what you perceive "reliable" to mean in this case.

What is the probable delivery date for the system? Could the need for it be classified with emergency status? Justify if your answer is affirmative.

How technologically complex is the item? If more than one producer built it, would problems arise due to its technological complexity? Justify.

How complete is the data package for the production of this system? If it is incomplete, explain why.

Are there any other comments that would justify procuring this item on a sole source rather than a competitive basis?

Congress could use the answers on these questions to analyze whether the Department of Defense is implementing the most economical procurement method possible. If the reviewing body is not satisfied with DOD's responses and justifications, it could refuse to approve expenditure on the system until it is satisfied that procurement officers are doing an acceptable job. In this way Congress could assure the American people that it is allowing sole source negotiation, and the

usually higher prices that accompany it, only after solid reasoning has been established supporting its action. The case studies prove that this process is warranted, since in each circumstance conscientious procurement on the part of the purchasing agent saved the Government many millions of dollars. And the American taxpayer deserves serious achievement of such economy in government. Nothing less is acceptable.

Thank you.

[The study by Mr. Yuspeh follows:]

THE GENERAL ADVANTAGES OF COMPETITIVE PROCUREMENT OVER SOLE SOURCE  
NEGOTIATION IN THE DEFENSE DEPARTMENT\*

A STUDY PREPARED FOR THE USE OF THE SUBCOMMITTEE ON PRIORITIES AND ECONOMY  
IN GOVERNMENT OF THE JOINT ECONOMIC COMMITTEE, CONGRESS OF THE UNITED  
STATES, NOVEMBER 12, 1973

(By Larry Yuspeh)

INTRODUCTION

The size of the federal budget has always been a prime concern of those who worry about inflation in our shaky economy. To be sure, if government expenditures are very high, aggregate demand may outrun output by such a large factor that an already severe inflation might worsen. Since military and related outlays compose a large percent of federal expenditures and a larger percent of controllable federal expenditures, it is apparent that the budget may be stabilized if stiff controls are imposed on military spending.

Many people have suggested areas of the military budget that could easily be cut. But while the necessity and wisdom of individual weapon systems have often been questioned, the amount saved if procurement of the questionable systems had been discontinued or modified might not be very great. However, if generally accepted Defense Department procurement policies had experienced similar scrutiny and change, the decrease in federal budget outlay due to the reduction of military expenditures could be more far reaching. Not only would dollar savings be greater, but such efficiency arguments also avoid the irreconcilable disarmament problems that accompany such a call for reduction in weapon system procurement. DOD could have its weapons and the efficiency-minded could have their budget cuts. All could live together in a state of fiscal detente.<sup>1</sup>

This investigation will therefore focus on a specific area of Defense Department procurement policy. Through use of the case study method, it will determine the effect on unit price and learning curve slope of a change from sole source to competitive procurement. After looking at the price reductions experienced in these cases, I will look to possible future savings that could be expected if the Defense Department competed the procurement of a greater number of complex systems. This paper will also refute many of DOD's arguments against the more widespread use of competitive procurement. In this way, then, I will establish both the advantages and feasibility of competitive procurement of sophisticated military equipment.

A NOTE ON THE DATA

All data in the case studies come from original contracts. Through the aid of contracting officers in the Department of Defense, relevant systems were identified. These people were also helpful in tracking down the actual contracts that held the pertinent data.

Calculations from the data are identical in each case study. All unit prices were first adjusted to 1970 dollars using the *Economic Indices for Avionics*

\*This study was done at the request of the chairman of the Subcommittee on Priorities and Economy in Government and has not been reviewed by the other members of the subcommittee.

<sup>1</sup>To be sure, efficiency combined with the discontinuation of unneeded weapon systems would be best. But if a choice between the two had to be made, efficiency would get mine, since it provides savings for procurement of all systems, not just a few.

Equipment from the Naval Air Development Center or price indices from guidance, control, and airframe equipment. With these adjusted data, price reductions were calculated from the unit price for the last sole source contract and the unit price for the first competitive contract. If "a" is the sole source price and "b" the competitive price, the percent reduction is simply

$$\frac{a-b}{a} \cdot 100.$$

To determine learning curve slopes, a canned program on the G.E. Mark I time-sharing system was used. Unlike normal learning curve data, prices rather than costs were used. Since prices for Defense Department contracts are a function of cost, the unit prices reliably reflect a contractor's operation costs. The Y axis of the cases' learning curves is therefore labeled unit price rather than unit cost. These curves are nevertheless valid indicators of the contractor's efficiency. Also, the data points are plotted on semi-log paper, because learning curves are linear when plotted in this way. If plotted on Cartesian coordinates, the curve is curvilinear and much more difficult to analyze. This adjustment is common for this sort of analysis.

## CHAPTER 1

### DEFINING THE TERMS

In order to grasp the import of the concepts under consideration here, an explanation of exactly what the concepts are is essential. The first is sole source procurement. In special cases, the federal government permits Defense Department contract negotiators to purchase equipment on the basis of cost negotiations from a single source. Margulis and Yoshpe explain that "negotiation generally involves informal discussion and bargaining with a view to reach agreement on prices and other terms under a proposed contract." They say further that "the purpose of negotiation . . . is to procure in the most effective manner for the best interest of the Government."<sup>2</sup>

While these brief statements give us both the what and the why of sole source procurement—at least from DOD's point of view—it hardly provides a valid understanding of the concept. To be sure, no matter how experienced the negotiator and how dogged the bargaining, there is virtually no way that price agreements following negotiations will be the lowest available to the government. If for no other reason than that profit is figured as a function of cost, negotiation would be a sub-optimal procurement technique. But when one realizes that DOD generally is not overly concerned with what it pays for equipment—just how it performs—the true inadequacy of sole source procurement becomes evident. The defense contractor knows that the Defense Department needs what he can make. And he also knows that he is the only person that has been approached to make it. Combine these two factors, and you have the essence of sole source negotiation at DOD.

A project manager wants a weapon system, and not just a good one, it has to be the best; and he wants that system at a particular time. Cost is a minor concern, at best. With this mentality coordinating logistics for a weapon system, little pressure is placed on the contract negotiator to really beat down the contractor. Also, if the negotiation process is dragging on, he might decide it best for himself to wrap up his talks, take whatever reductions have already been agreed upon, and initiate the production stage. It is neither the most effective procurement method, nor its it in the government's best interest. The negotiator feel he has done his job, and if he is too conscientious in demanding low prices from contractors, he may throw the long-term procurement plan off schedule and actually lose points for doing his job too well. The conflicts are real, and they often result in outrageously high unit prices, unacceptably high levels of inefficiency among defense contractors, and often low quality equipment. But the Defense Department nevertheless poses several arguments supporting sole source procurement in spite of the arguments against it presented here. Certainly some are valid, but most are not; my refutation of them appears in the concluding part of the paper.

The second concept is competitive procurement. For the purposes of this study, competition will encompass three forms. The first is the most basic, formal advertising. Theoretically the Defense Department is directed by law to use this

<sup>2</sup> H. Margulis and B. Yoshpe, *Procurement*, Washington, D.C.: Industrial College of the Armed Forces, 1964.

procurement method at all times, except for those specifically listed as exceptions to the rule of law. Unfortunately, in the eyes of the Defense Department, there seems to be many weapon systems that fall into the exception category.

Formal advertising for weapon systems proceeds in the following way. A detailed and accurate data package must exist and be available to all potential bidders. The contractors, after carefully studying the data provided to them, must decide on a unit price at which they can produce the needed item. That price and justifications for it are sealed in an envelope, mailed to the Defense Department, and together all of them are opened. Whatever company bid the lowest unit price wins the competition and is then contracted to produce the system at its bid price. No negotiation occurs. Since the winning contractor decides on the price at which he can afford to produce, he must live with his decision. Formal advertising is an optimal procurement method, because it avoids all of the pitfalls associated with negotiation.

Sometimes, circumstances make the use of formal advertising impossible. Data packages may be very ambiguous or simply incomplete. If procurement of such items were formally advertised, the uncertainties in the data would come back to haunt DOD in the form of the goblin of cost-overrun claims from the contractor. And since such claims are usually honored by the government, formal advertising used here could result in higher costs rather than lower ones. Also if an item is technologically very complex, it may be difficult to find enough companies capable of producing the item to warrant the issuing of invitations for bids. Because the decision as to whether this circumstance actually exists is quite subjective, it can easily be used as an excuse to negotiate procurement on a sole source basis. And it often is. But the abandonment of formal advertising need not free DOD to shoot across the procurement spectrum to sole source negotiation. An intermediate position on that spectrum saves the need for spanning the whole expanse. That intermediary is competitive negotiation. Competitive negotiation proceeds very much like formal advertising. However, when the bids are opened, the lowest bidder is not guaranteed the contract. Rather, negotiations with each bidder follow. To be sure, the trappings of negotiation exist here as in sole source procurement. But the contractor's knowledge that he is not the only source being approached significantly weakens his bargaining position. If he wants DOD's business, he may be forced to soften his position or risk losing the contract to one of the other bidders. In this way, the Defense Department avoids many of the problems associated with sole source procurement while also avoiding the problems that could arise if formal advertising were implemented under improper conditions.

Related to competitive negotiation is a modification of pure competition that is necessary when no second sources exist, the educational contract. An educational contract is only for a small lot, usually about two hundred items. And its purpose is to permit another contractor to perfect operations for producing a particular weapon system. The price on this type of buy is always higher than the sole source price, because the new contractor has never produced the item before and therefore has no experience that could reduce his operation costs. For underwriting the added expense of the educational buy, the Defense Department receives in return a well-trained, efficient second source. Now that it has a reputable second source, DOD can compete the next contract buy for the system and enjoy the economies that usually accrue to such a change in procurement method.

We might characterize the competition spectrum in the following way. At one end there is sole source negotiation, in which competition plays no role at all. At the other end is formal advertising, free competition in its purest form. And falling somewhere between the two is competitive negotiation. Whether it leans more toward a competition factor of 0 or 1 depends on how many competitors there are, how complete the data package is, how complex the technology is, and how much responsibility is placed on the negotiation process instead of the bid in arriving at the contract unit price. The closer the environment is to pure formal advertising, the better the chance for competitive negotiation to approach a competition factor of 1. However, if the procurement process leans more forward the 0 end of the spectrum, results will approach those that would be expected to follow from sole source negotiation.

The competition spectrum is diagrammed in Figure 1.

## Spectrum of competition (fig. 1)

Sole source negotiation	Competitive negotiation	Formal advertising
0	$\frac{1}{2}$	1

## COMPETITION FACTORS

## Less competitive:

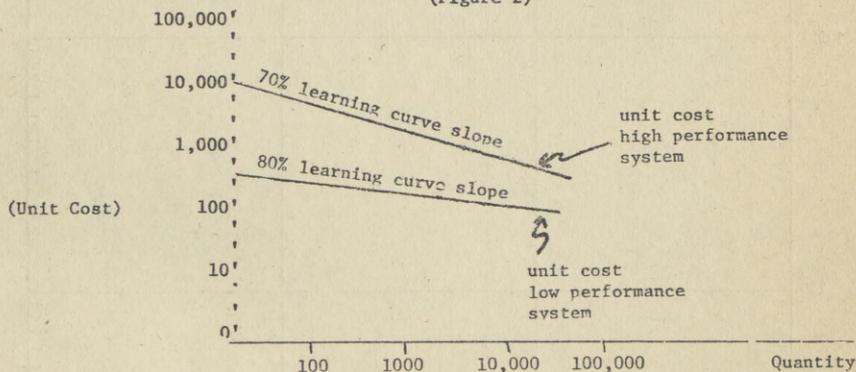
- (1) Few competitors
- (2) Incomplete data
- (3) Very high technology
- (4) High responsibility on negotiation

## More competitive:

- (1) Many competitors
- (2) A relatively complete data package
- (3) Low to moderate technology
- (4) Low responsibility on negotiation

The last general concept is the learning or progress curve. Learning curves tell managers how efficient their operations are. By graphing output as a function of cost, an administrator learns how price level changes as output is expanded. A learning curve is usually identified by whatever its slope is. To say that operations for a new avionics equipment proceed along an 80 percent learning curve means that as the quantity produced doubles, the cost is reduced by 20 percent. If the learning curve has a 70 percent slope, then cost is reduced by 30 percent when the quantity doubles. Also, the higher the numerical slope, the flatter the curve is. A 60 percent progress curve is very steep; a 95 percent curve is very flat. Another basic characteristic of learning curves is their high-low unit cost performance mix. In a high performance system, say with a 70 percent learning curve, the first unit cost will be very high. Conversely, in a low performance system with a learning curve of 80 percent, the first unit cost will be very low. The importance of these factors will become obvious in the case studies. Figure 2 graphically depicts the characteristics of the learning curve developed in this simple explanation.

(Figure 2)



From Figure 2 we see that if a sole source learning curve were a unit cost high performance system and a competitive learning curve were a unit cost low performance system, the two curves would intersect at some quantity produced in the respective operations. If that intersection quantity were not very large, the savings that might be achieved from competing an item could quickly be lost and reversed to losses on all items produced after intersection was achieved. If this situation occurred, it might not pay for the government to compete an item procured on a negotiated sole source basis. In each case, where the data is available, the possibility of a small intersection quantity will therefore be assessed.

## CHAPTER 2

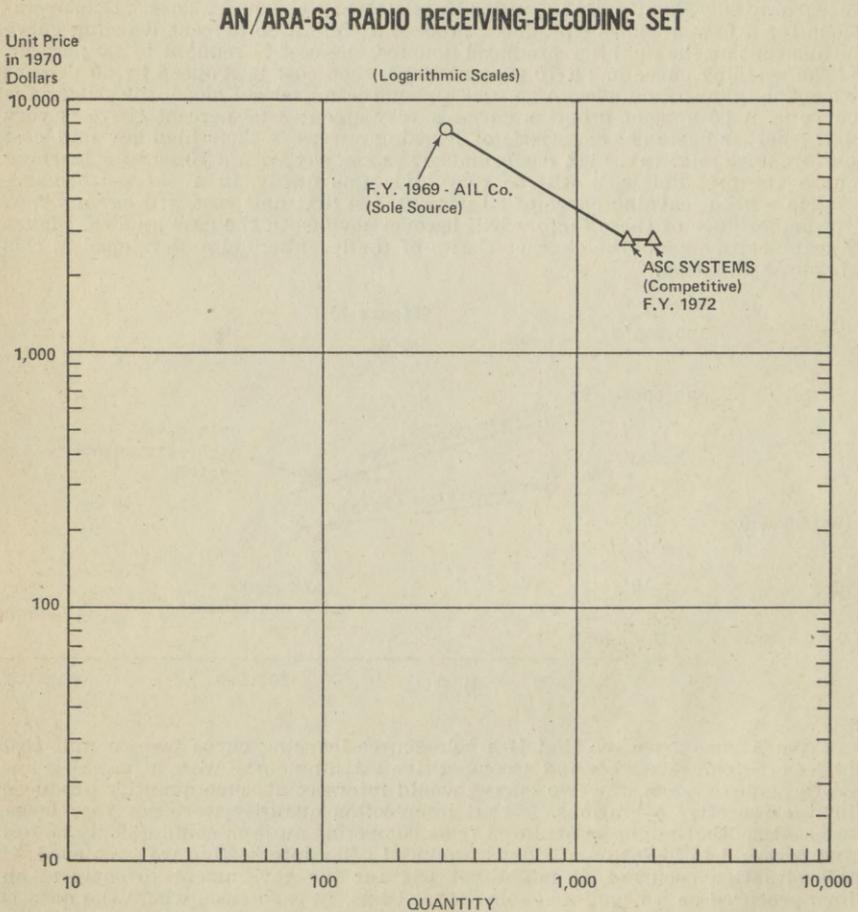
## CASE STUDIES

*Case 1: AN/ARA-63 Radio Receiving—Decoding Set*

The AN/ARA-63 is a radio receiving-decoding set used on carrier aircraft. It is the airborne portion of the carrier system for the C-SCAN program. The ARA-63 presents azimuth and elevation information on a data link from the carrier on an overhead display in the cockpit.

While there is insufficient data (because there has not been enough buys—only two contracts) to derive any learning curves, the data does reveal one important factor in the decision to move from sole source to competitive. When the government put purchase of the AN/ARA-63 on a competitive basis, its price dropped by more than 50 percent (from \$7,540 for AIL to \$3,146.54 for ASC). The graph shows the plot points, and the line traces the dramatic price reduction due to the decision to purchase by competitive bidding.

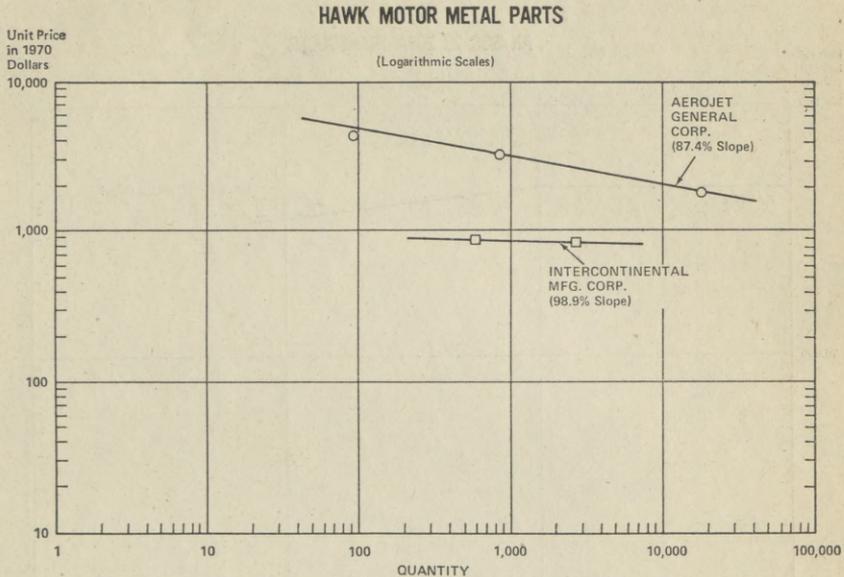
From this case all that can be concluded is that the change from sole source to competitive procurement provides a significant reduction in unit price.



## ARA-63 RADIO RECEIVING-DECODING SET

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
AIL Co.....	N00024-69-C-1300	1969	1,325	SS	\$7,540.00	\$7,849.13
ASC Systems Corp.....	N00019-72-C-0276	1972	685	C	3,146.54	2,882.24
	N00019-72-C-0276	1972	1,382	C	3,146.54	2,882.23

<sup>1</sup> Option.



*Case 2: Hawk Motor Metal Parts*

Hawk Motor Metal parts are composed of the motor casing or aft body of the Hawk Missile and the hardware for fittings used to attach the front end and fins to the body.

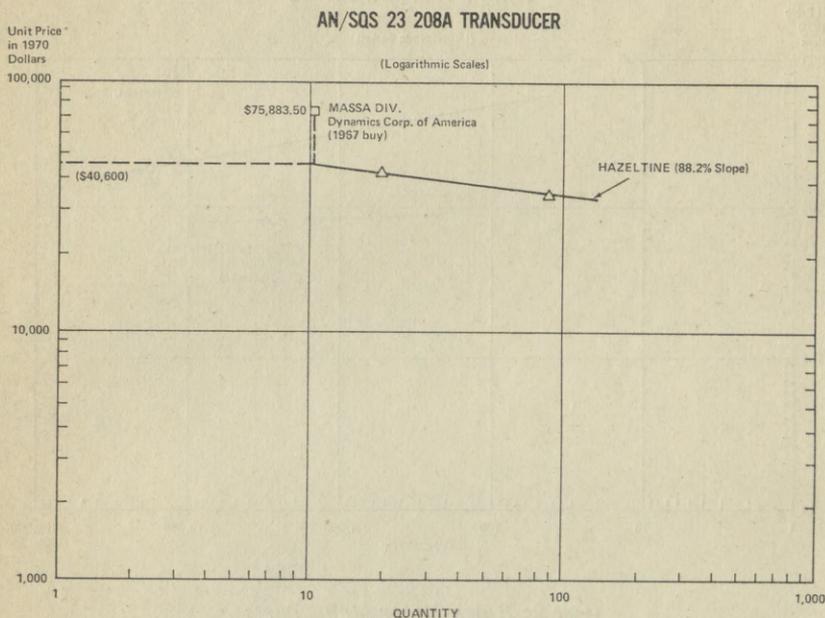
In 1958, Aerojet General Corporation received the initial contract, sole source to build the motor metal parts for the Hawk Missile. It held that contract through 1961 and produced 44,622 units during that period of operations. Each successive buy brought the government a lower price, as Aerojet produced along an 87.4 percent learning curve.

In 1964, the procurement method for Hawk motor metal parts was switched from sole source to competitive bidding. Intercontinental won that competition. Its unit price was almost one-half of Aerojet Manufacturing Corporation's lowest previous unit price (\$678 for Intercontinental to \$1224 for Aerojet). Intercontinental's learning curve was, however, very much flatter than its competitor's (98.9 percent slope for IMC to 87.4 percent slope for AGC).

This particular case supports the hypothesis that says that when procurement method changes from sole source to competitive, unit price falls considerably while learning curve slope concomitantly becomes very flat. Here, unit price fell from \$1224 to \$678 and learning curve slope changed from a relatively steep 87.4 percent slope to an extremely flat 98.9 percent slope.

## HAWK MOTOR METAL PARTS

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Aerojet General Corp.	ORD-4300	FY 1958	256	SS	\$2,574	\$4,165
	ORD-4300	FY 1959	1,366	SS	2,192	3,420
	ORD-1052	FY 1960-61	43,000	SS	1,224	1,778
Intercontinental Manufacturing Corp.	AMC-01482	FY 1964	1,545	C	678	891
	AMC-01872	FY 1964	2,279	C	662	870



*Case 3: AN/SQS 23 208A Transducer*

The AN/SQS 23 208A is a transducer used on many Navy aircraft.

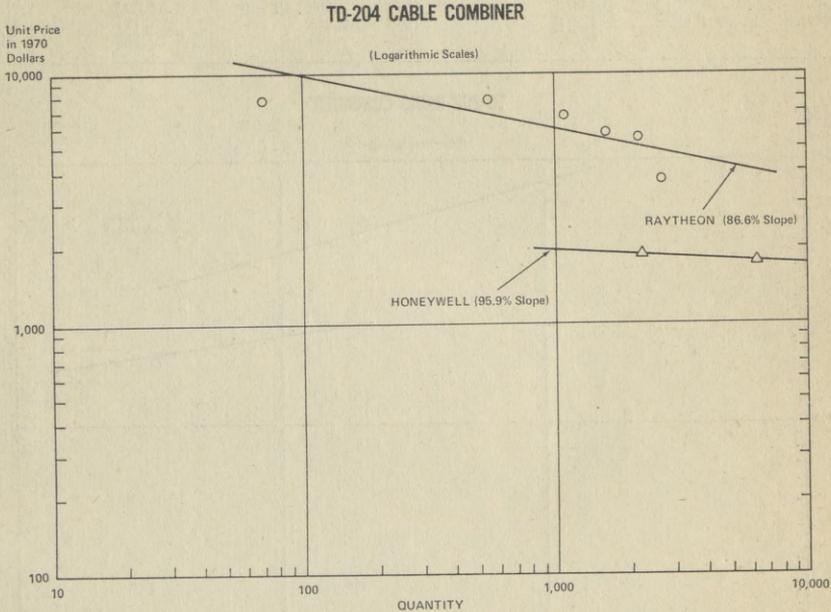
Massa Division of Dynamics Corporation of America received the first procurement contract for the SOS 23 208A transducer in 1967 on a sole source basis. There was only this one sole source buy.

Procurement of the SQS 23 was changed from sole source to competitive bidding in 1968. Hazeltine won that competition and has produced the transducer since reception of its first contract in 1968. Since Massa had only one contract and therefore only one plot point no conclusions can be drawn concerning learning curve slope. However, in the price area, again we notice a sizeable drop in unit price level (Hazeltine's unit price was \$36,926 on its first contract as compared to \$65,700 for Massa's).

This case supports the hypothesis that asserts that when procurement method is changed from sole source to competitive, a considerable fall in unit price level can be expected in the first competitive contract. As was previously explained, because there is only one plot point for Massa and therefore no learning curve, no learning curve comparison can be made. It is noteworthy, however, that Hazeltine's learning curve slope is a fairly steep 88.2 percent. And while it is impossible to say whether this slope is flatter than Massa's; considered alone, it is steep to be sure for a contractor who has received the business from a competitive bid.

## AN/SQ S-23 208-A TRANSDUCER

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Massa Division, Dynamics Corp. of America.	67-C-1406	May 16, 1967	29	SS	\$65,700	\$75,883.50
Hazeltine	69-C-1084	Oct. 25, 1967	54	C	36,926	40,249.34
	69-C-1084	Fiscal year 1973	69	C	35,400	30,691.80



## Case 4: TD-204 Cable Combiner

The TD-204 is a cable interface unit that is used between the multiplexer and coaxial cable in a cable communication link. It processes signals to convert them to acceptable form for cable transmission and demultiplexing. It also is used as an attended repeater and as an interface unit in radio-to-cable conversion stations.

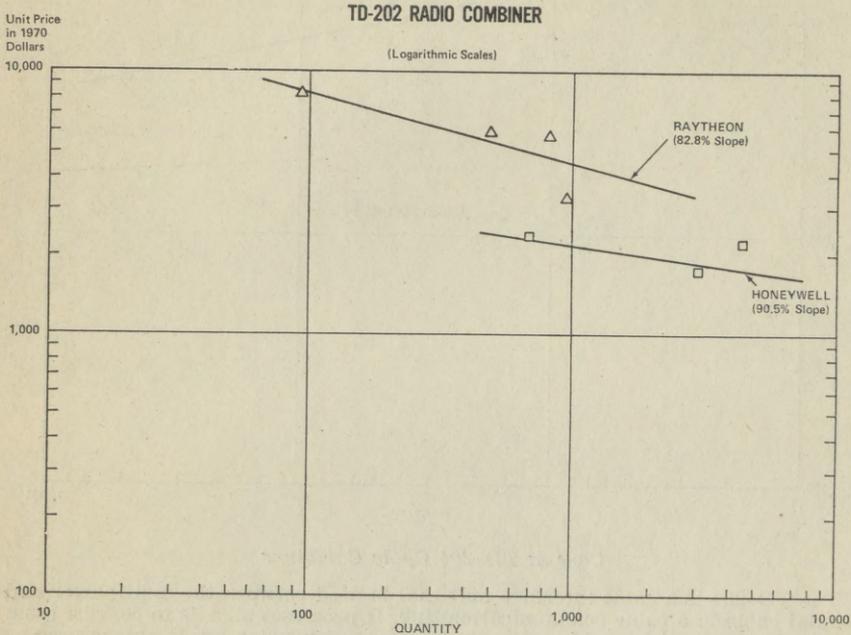
Raytheon received the initial sole source contract for the TD-204 in 1965. It continued to produce the cable combiner through 1968, when Honeywell won the contract on a competitive bid. At the outset, Raytheon's price reductions due to learning were moderate. After the competition, however, its 1968 final unit price dropped significantly (from \$5019 to \$3423). Raytheon's learning curve therefore reflects a relatively steep 86.6 percent slope.

Honeywell won the 1968 competition for production of the TD-204 and in that year received a contract calling for production of more cable combiners than Raytheon had produced in all its years of production combined (5943 units as compared to 2887). Honeywell's unit price for the first contract was less than half of Raytheon's lowest unit price (\$1711 as compared to \$3423). Again we also see that while the competition's winner boasts a much reduced unit price, its learning curve is nevertheless very much flatter than that of the sole source producer (86.6 percent slope for Raytheon as compared to a 95.98 percent for Honeywell).

This case supports the hypothesis that contends that when procurement method changes from sole source to competitive, unit price drops significantly but learning curve slope flattens significantly as well. Here, the unit price fell from \$3423 for Raytheon to \$1711 for Honeywell, the competition winner. But Honeywell's learning curve slope flattened to about 96 percent from Raytheon's fairly steep 86.6 percent.

## TD-204 CABLE COMBINER

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Raytheon.....	04878	1965	200	SS	\$86,083	\$87,780
	04878	1967	760	SS	6,603	7,732
	04878	1967	225	SS	5,723	6,702
	04878	1967	633	SS	4,951	5,798
	04878	1968	484	SS	5,019	5,506
	04878	1968	555	SS	3,423	3,755
Honeywell.....	1225B	1968	5,943	C	1,711	1,877
	0613	1968	145	C	1,689	1,765
	0613	1969	145	C	1,689	1,765

*Case 5: TD-202 Radio Combiner*

The TD-202, a radio combiner, is used as a radio transmission interface unit. It accepts outputs from multiplexers and processes them for transmission. It is also used at radio repeater stations and as interface units at radio-to-cable conversion terminals.

In 1965, Raytheon received the first sole source production contract for the TD-202 radio combiner. Through 1966 it was the only producer, but in 1967 Honeywell captured virtually all of the market after winning the competition between it and Raytheon. (Honeywell produced 1955 units in 1967 as compared to 185 for Raytheon; 2635 to 170 in 1968). Raytheon's unit prices declined with each new buy, and its operations progressed along a fairly steep 82.8 percent learning curve.

As was explained above, due to winning a competitive bid, Honeywell captured the bulk of the TD-202 market. Again we see that its unit price was far less than Raytheon's lowest and less than half of Raytheon's 1967 bid (\$4806 in 1967 for Raytheon as compared to \$1983 for Honeywell). But accompanying this much lower price is a flatter learning curve (82.8 percent slope for Raytheon compared to 90.5 percent for Honeywell). It should be noted, though, that while Honeywell's learning curve is flatter than Raytheon's, it is nevertheless a respectably steep learning curve. To be sure, Honeywell is even more attractive as a pro-

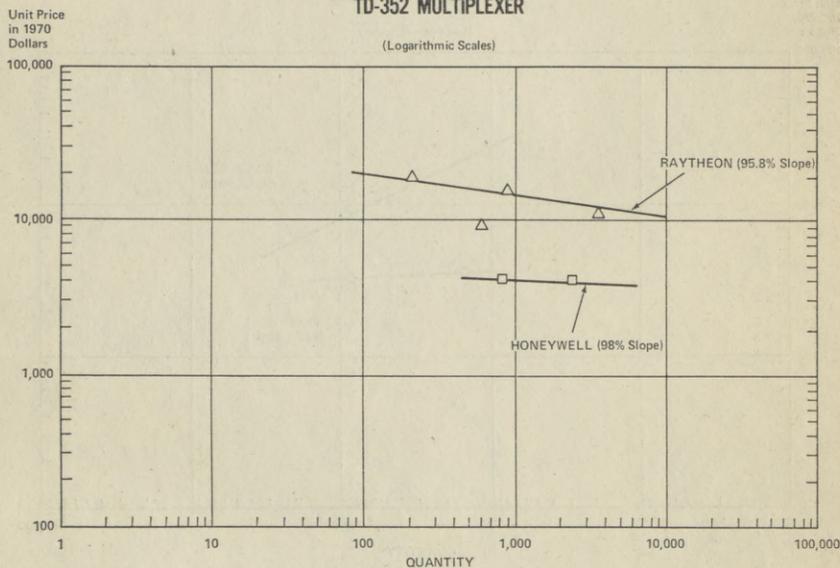
ducer, because not only is its unit price much lower than Raytheon's, but its learning curve is also steep enough to afford the government significantly lower future prices.

This case supports the hypothesis that when procurement method changes from sole source to competitive, unit price falls and learning curve slope flattens. Here, unit price fell from \$4806 for Raytheon to \$1983 for Honeywell. And learning curve slope flattened from 82.8 percent for Raytheon to 90.5 percent for Honeywell. It is noteworthy, though, that Honeywell's learning curve is not as flat as some from other cases—it surely reflects progress and lower prices for future buys.

## TD-202 RADIO COMBINER

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Raytheon.....	04878	1965	280	SS	\$6,432	\$8,226.53
	04878	1966	422	SS	4,710	5,821.56
	04878	1967	185	SS	4,806	5,627.83
	04878	1968	170	SS	3,068	5,365.60
Honeywell.....	1225B	1967	1,955	C	1,983	2,322.09
	1225B	1968	2,185	C	1,587	1,740.94
	0613	1968	450	C	2,009	2,203.87

## TD-352 MULTIPLEXER



## Case 6: TD-352 Multiplexer

The TD-352 is a multiplexer that converts voice-frequency signals in several communications channels to a time-division multiplex, pulse-code-modulated signal.

Raytheon was the first producer of the multiplexer. It held the TD-352 contract on a sole source basis for three years, until it lost almost all of the market in 1968. Raytheon's production demonstrated some learning, but not very much. Its learning curve had a 95.8 percent slope. Necessarily, price level varied little over this production period.

In 1968, procurement of the TD-352 was placed on a competitive basis. Honeywell won that competition and was given an order for 2218 units as compared to 87 for Raytheon. Also, Honeywell's price was far lower than Raytheon's (\$3912 for Honeywell as compared to \$9361 for Raytheon). While the winner's price was much lower, once again its learning curve slope was flatter than that of

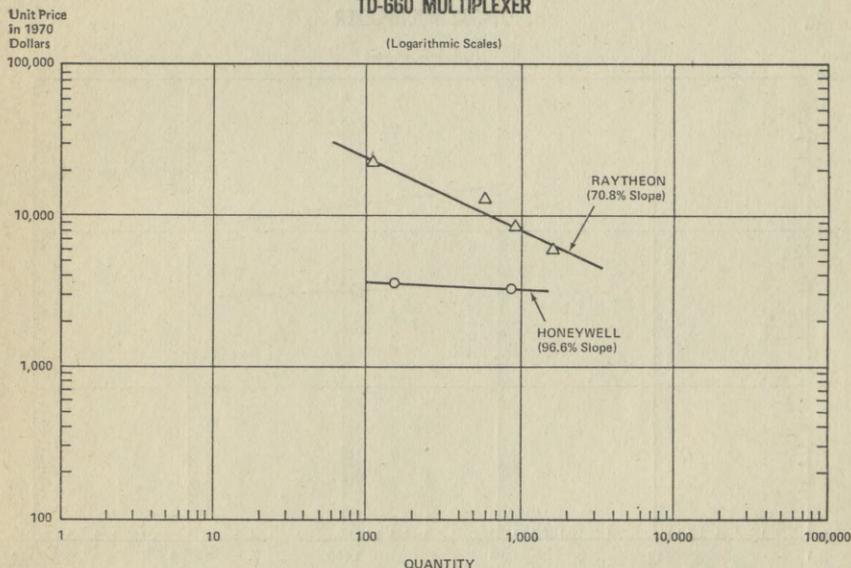
the sole source producer. In this case, Honeywell had a 98 percent slope as compared to Raytheon's 95.8 percent slope. To be sure, neither reveals excessive learning effects but the trend prevails nevertheless.

This case again supports the hypothesis that asserts that when procurement method changes from sole source to competitive, price drops notably, and learning curve slope flattens. Here, the TD-352 price dropped from \$9361 to \$3912. Learning curve slope flattened from 95.8 percent to 98 percent. It is noteworthy, though, that although Honeywell's learning curve is very flat, Raytheon's is not significantly better (although it produced at a much higher price).

TD-352 MULTIPLEXER

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Raytheon.....	04878	1965	560	SS	\$9,312	\$11,910.00
	04878	1966	61	SS	7,735	9,560.46
	04878	1967	675	SS	9,330	10,925.43
	04878	1968	87	SS	9,361	10,269.00
Honeywell.....	1225B	1968	2,218	C	3,912	4,291.46
	0613	1968	140	C	3,836	4,118.35
	0613	1969	140	C	3,941	4,208.09

TD-660 MULTIPLEXER



#### Case 7: TD-660 Multiplexer

The TD-660 multiplexer converts voice-frequency signals in several communications channels to a time division multiplex, pulse-code-modulated signal.

Raytheon was the initial producer of the TD-660. It held the procurement contract for the multiplexer on a sole source basis for three buys. In 1969, procurement method changed from sole source to competitive, and Raytheon lost more than one half of its market (1418 purchased from Honeywell as compared to 1070 purchased from Raytheon). Throughout its operations period, Raytheon demonstrated significant price reductions. Its learning curve slope is therefore very steep, 70.8 percent.

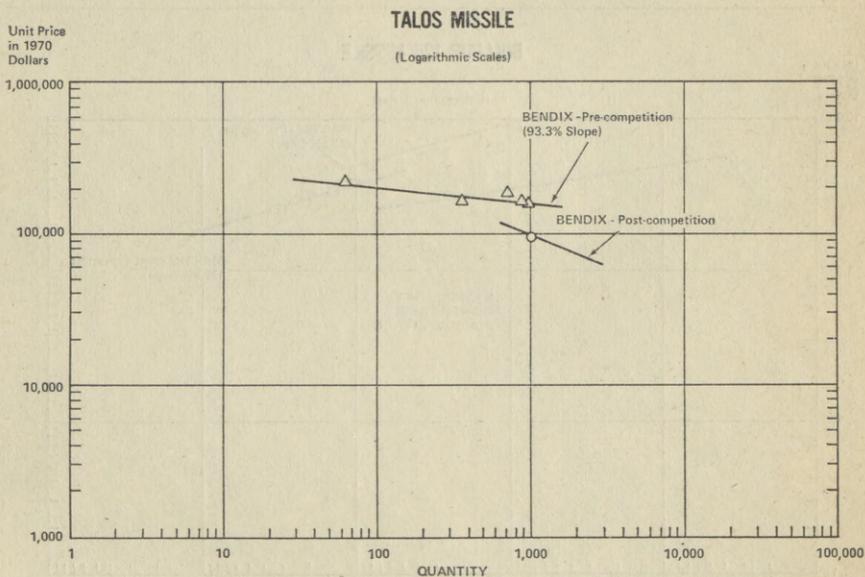
Honeywell supplied part of the TD-660 procurement by winning a 1969 competition with Raytheon. The multiplexer's price fell markedly in comparison to Raytheon's lowest production price (Honeywell—\$3,375 as compared to Raytheon's \$5,693). Also, as happened with several other cases, the low production price

was accompanied by a very flat learning curve slope (Honeywell had a 96.6 percent slope as compared to Raytheon's 70.8 percent slope.)

This case supports the hypothesis that asserts that when procurement method changes from sole source to competitive, price falls significantly, but learning curve slope flattens significantly as well. Here, price fell from \$5,693 for Raytheon to \$3,375 for Honeywell. But Raytheon's very steep 70.8 percent learning curve slope shifted to Honeywell's very flat 96.6 percent learning curve slope.

## SYSTEM TD-660

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Raytheon.....	0167	1967	400	SS	\$19,010	-----
	0167	1968	350	SS	10,889	\$12,751
	0332	1969	355	SS	7,931	8,288
	1012	1969	1,070	SS	5,693	5,949
Honeywell.....	1036	1969	425	C	3,375	3,527
	1037	1969	993	C	3,092	3,231



## Case 8: Talos Missile

Bendix was awarded the initial Talos missiles contract on a sole source basis in 1961. It produced the missile sole source until 1966, when the government changed procurement method from sole source to competitive. Bendix won the competition, however, and continued to produce the Talos through 1968, its last buy.

While producing sole source, Bendix demonstrated moderate learning and therefore moderate price reductions. Its price varied from \$167,181 in FY 61 to \$135,658 in FY 65. For that production period, its learning curve slope was 93.3 percent.

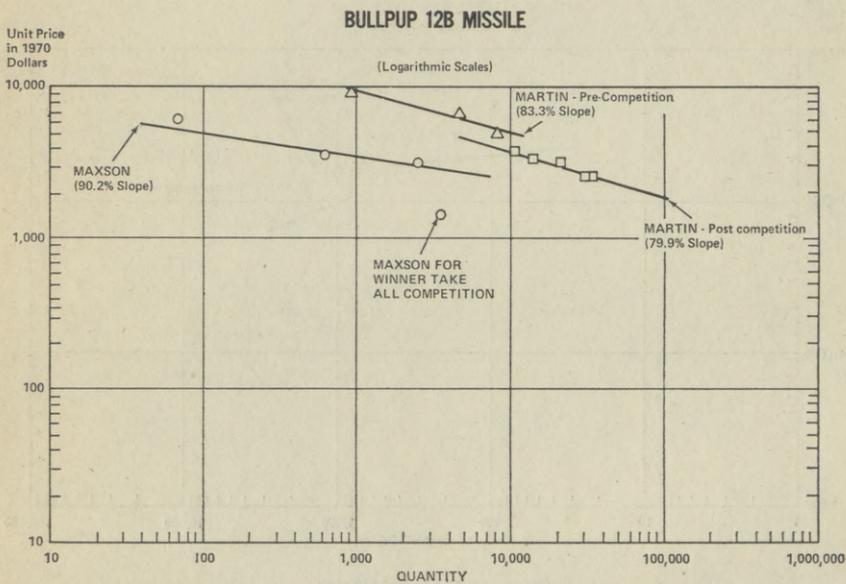
In 1966, the Defense Department competed the Talos Missile in order to receive a lower price. Bendix's bid won this competition and continued production of the weapon. As in other cases, the winning bid was significantly lower than the previously lowest sole source price (\$80,356 after competition as compared to \$135,658 before competition).

NOTE.—On the TD-202, TD-204, TD-352, TD-660, the data was extracted from a Booz-Allen Applied Research, Inc. report, *Development of Acquisition Cost Model*.

Since Bendix was bidding on a three-year multi-year buy, it offered one unit price that would be effective for each of the contract's three years. Because of this state, the prices were inflated according to the 1966 price inflator. Since all prices were the same, there is no competitive learning curve. Regardless, this case study proves that change in procurement method from sole source to competitive bring significant unit price reductions (from \$159,263 sole source to \$92,249 [1970 dollars] competitive).

## TALOS MISSILE

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Bendix	NOW-61-0365	1961	178	SS	\$167,181	\$218,506
	NOW-62-0441	1962	407	SS	130,378	166,232
	NOW-63-0460	1963	240	SS	146,223	179,854
	NOW-63-0460	1964	94	SS	135,572	162,822
	NOW-65-0227	1965	94	SS	135,658	159,263
	NOW-66-0272	1966	94	C	80,356	92,249
	NOW-66-0272	1967	188	C	80,300	
	NOW-66-0272	1968	188	C	80,330	



## Case 9: Bullpup 12B Missile

The Bullpup A (numbered the 12B) Missile was procured initially on a sole source basis from Martin. After one sole source buy in 1961, the Defense Department switched to a competitive procurement method. The purpose of the change was to create a second production source that would be efficient enough to permit a future winner-take-all competition. Therefore, Bullpups were purchased from the original producer, Martin, and from a new one, Maxson. From FY 61 through FY 63, a far greater number of missiles was purchased from Martin rather than Maxson (1961—1078 vs. 200; 1962—15,904 vs. 1,000; 1963—9,155 vs. 3,238). Also,

Martin's price was always lower than Maxson's for all buys in that period (1961—\$2,848 vs. \$4,760; 1962—\$2,547 (& \$2,448) vs. \$2,772; 1963—\$2,047 vs. \$2,548). Yet in 1963, the difference in efficiency had narrowed greatly; both producers were on relatively equal terms. At this point, the Department of Defense switched procurement of the Bullpup from this type of competition to a winner-take-all competition. Maxson submitted the lower bid and won the 1964 contract for 3,580 Bullpup A Missiles; unit price was \$1,227, a significant savings from any previous prices.

When Martin produced the Bullpup A on a sole source basis, its learning curve was fairly steep (83.3%) due to significant price reductions at each buy (a range from \$6,687 in 1959 to \$3,802 in 1961). When Martin won the larger part of a competitive buy, its unit price fell sharply (from \$3,802 to \$2,848). What is important is that this sizeable price drop came in the same year, 1961. Not only did price fall, but learning curve slope became steeper, not flatter, after competition was introduced (a shift from 83.3% to 79.9%). This increased progress was probably the result of yearly competition, rather than learning. That is, each buy from 1961 through 1963 was competed between Martin and Maxson. Necessarily, Martin was forced to offer its best price in order to hold its share of the market. Thus, its learning curve slope became steeper, because on each successive buy it was forced to lower its bid to keep the larger part of the Bullpup A market.

Maxson was asked to produce the Bullpup A in order to give the Defense Department a second procurement source for the missile. In 1961, its price was much higher than Martin's (\$4,760 as compared to \$2,848), but by 1962, the difference between the prices had closed considerably (\$2,772 as compared to \$2,547). Because of its short production history, Maxson's learning curve was relatively flat (90.2% slope). But in 1964, Maxson won the winner-take-all competition for Bullpup A production. Its bid was \$1,227, much lower than its previous low price, \$2,548, or Martin's previous low, \$2,047.

As in the other cases, when procurement method was changed from sole source to competitive, significant price reductions followed. On the first competition, price fell from \$3,802 to \$2,848. On the winner-take-all competition, price fell from \$2,047 to \$1,227. These data indicate a new hypothesis—winner-take-all competition brings the lowest possible price, while simple competition (one in which both competitors receive part of the buy) brings only a lower price. Another possible hypothesis is—learning curve slope can be improved forcibly by competing the item year to year, either on a winner-take-all or simple basis. In this case, Martin's competitive learning curve slope was steeper than its sole source one, because each buy was competed just as the initial buy was. By keeping pressure on its procurement sources, the Defense Department probably would receive its lowest price.

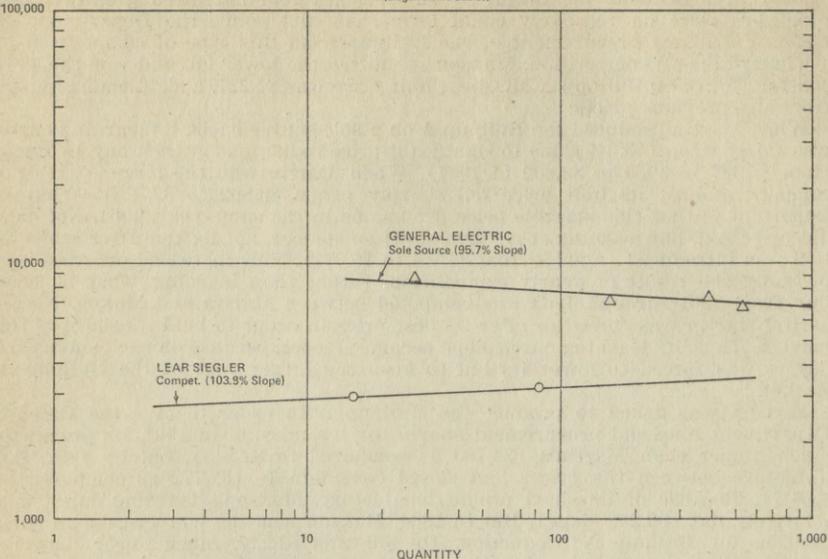
## BULLPUP 12-B MISSILE

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Martin.....		1959	3,015	SS	\$6,687	\$9,208
		1960	3,805	SS	4,987	6,693
		1961	3,375	SS	3,802	4,969
		1961	1,078	C	2,848	3,725
		1962	6,363	C	2,547	3,427
		1962	9,541	C	2,448	3,121
		1963	6,355	C	2,047	2,518
Maxson.....		1963	2,800	C	2,047	2,518
		1961	200	C/lrn.	4,760	6,226
		1962	1,000	C/lrn.	2,772	3,534
Maxson.....		1963	3,238	C/lrn.	2,548	3,134
		1964	3,580	C/wta	1,227	1,474

Unit Price  
in 1970  
Dollars  
100,000

## 60-6402 ELECTRIC CONTROL

(Logarithmic Scales)



*Case 10: 60-6402 Electric Control*

General Electric was awarded the first production contract on a sole source basis in 1966. It maintained its absolute control of the market through 1968 (which included three more buys). In 1969, the procurement method was switched to competitive, and G.E. lost its production rights to Lear Siegler. In terms of price level, G.E. showed a significant unit price drop in the second contract (\$7,272 in 1966 as compared to \$6,135 in 1967). But after the \$6,155 unit price, price level shifted up, only to return to slightly below the 1967 level. Due to this form of price stabilization, learning curve slope was relatively flat. General Electric produced along a 95.7% learning curve.

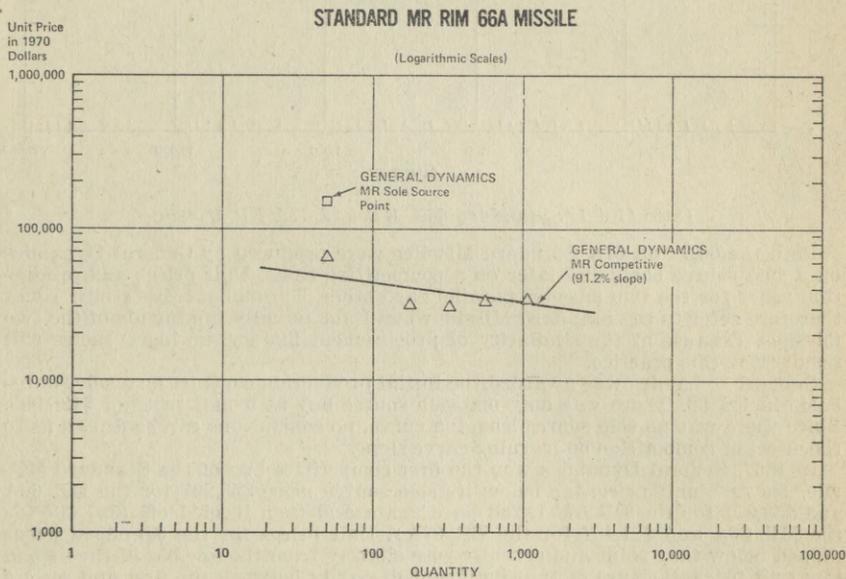
Lear Siegler assumed production of the 60-6402 electric control after it won the competition for producing the item. Its 1969 unit price was \$2,900, far below any price previously offered by General Electric. On the next buy, Lear's price rose slightly to \$3,314. And because there are only two identifiable production runs for Lear, its progress moves along a learning curve that slants upward (103.8 percent slope). Although Lear experienced a unit price increase, its higher unit price still well below G.E.'s lowest previous one.

We have again reviewed a case that supports the hypothesis that says when procurement method changes from sole source to competitive, price level falls significantly, but learning curve slope flattens significantly as well. In this circumstance, price level fell from \$6,927 (1970 dollars) for General Electric to \$3,030 (1970 dollars) for Lear Siegler. Learning curve flattened from 95.7 percent for G.E. to 103.8 percent for Lear. To be sure, neither slope was very steep, but the large price reduction after the switch to competitive procurement made the change very valuable in terms of monetary savings to the Defense Department.

## 60-6402 ELECTRIC CONTROL

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
General Electric.....	AF33(657)-15124	May 16, 1966	70	SS	\$7,272	\$8,988
	F33657-67C-0395-	June 30, 1967	194	SS	6,135	7,184
	P002					
	F33657-67C-0258-	Feb. 15, 1968	249	SS	6,755	7,410
Lear Siegler.....	P001,					
	P007,	June 5, 1968	22	SS	6,314	6,927
	P012.					
	F33657-69C-0662-	Jan. 15, 1969	39	C	2,900	3,030
	d P003	May 12, 1969				
	P0009 }	Oct. 21, 1970	180	C	3,314	3,314
	P00010 }					
	P00012	June 22, 1972	112	C	3,314	3,314

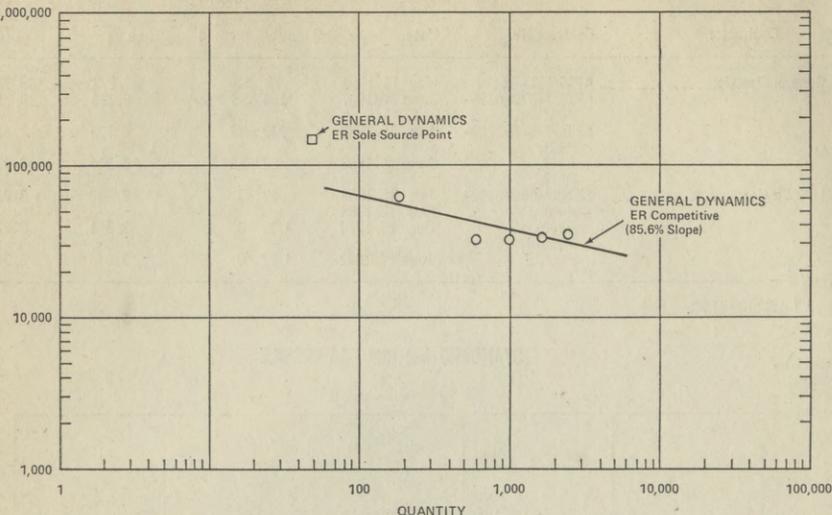
<sup>1</sup> 1 quantity of 92.



## STANDARD ER RIM 67A MISSILE

Unit Price  
in 1970  
Dollars  
1,000,000

(Logarithmic Scales)

*Case 11 & 12: Standard 66A MR and 67A ER Missile*

Both the 66A and 67A Standard Missiles were produced by General Dynamics on a sole source basis and later on a competitive basis. Unit prices and production years for the two missiles parallel each other. Throughout this study, I will therefore refer to the Standard Missile when I am actually talking about the two missiles. Because of the similarity of procurement history, no inaccuracies will result from this practice.

General Dynamics was awarded the initial production contract on a sole source basis in FY 66. There was only one sole source buy at a unit price of \$128,005. Since there was no sole source learning curve, no conclusions can be drawn as to the effect of competition on learning curve slope.

In 1967, General Dynamics won the first competitive buy of the Standard Missile. Its first unit price, far below its sole source price \$53,207 for the MR 66A and \$53,921 for the ER 67A), fell once again and then leveled off (\$27,117 for the MR 66A and \$27,451 for the ER 67A). Unit prices for the Standard never dipped below that point and actually rose slightly from the low bid of the second buy unit price. Because of the significant disparity between the first and second competitive unit prices, the learning curve for the Standard was relatively steep (91.2 percent for the MR 66A and 85.6 percent for the ER 67A).

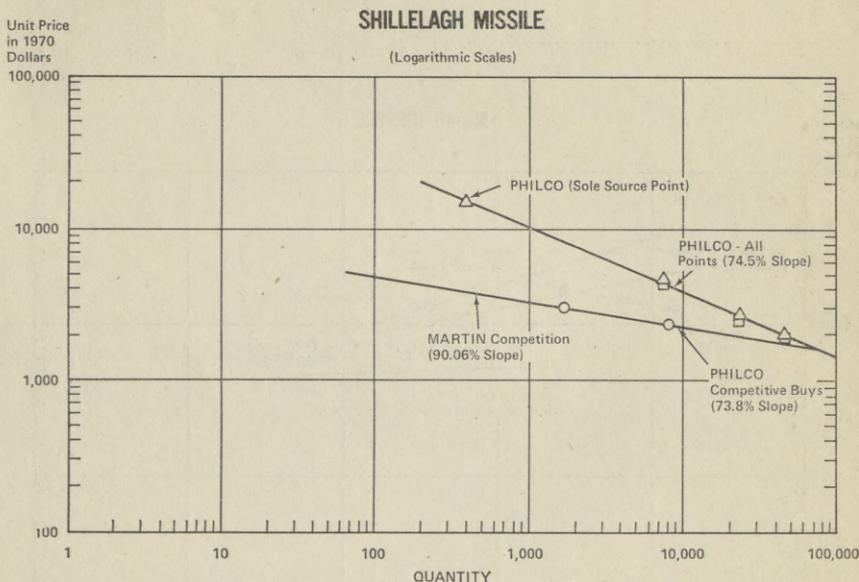
Only half of our hypothesis obtains in this case. We observe that due to competition, significant unit price reductions were experienced (from \$128,005 to \$53,207 for the MR 66A and from \$128,005 to \$53,921 for the ER 67A). Because there was no sole source learning curve, no conclusion can be drawn pertaining to that part of the hypothesis.

## STANDARD MISSILE MR RIM 66A

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
General Dynamics		1966	50	SS	\$128,005	\$149,766
		1967	144	C	53,207	60,230
		1967	72	C	27,177	30,764
		1968	240	C	27,177	29,786
		1969	240	C	31,167	33,767
		1970	400	C	33,767	33,767
		1971	400	C	33,767	32,653

## STANDARD MISSILE ER RIM 67A

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
General Dynamics	-----	1966	50	SS	\$128,005	\$149,766
		1967	575	C	53,921	61,039
		1967	109	C	27,451	31,075
		1968	660	C	27,454	30,090
		1969	660	C	31,424	32,712
		1970	500	C	34,024	34,024
		1971	500	C	34,024	32,901

*Case 13: Shillelagh Missile*

Philco was awarded the first production contract on a sole source basis in January of 1966. It produced only 1,393 missiles before the Defense Department decided to compete the item. Later in 1966 Philco won the larger part of the Shillelagh production (16,552 for Philco as compared to 4,960 for Martin). It held its share of the production market throughout its entire period of operations for the missile. Also during that time it demonstrated consistent price reductions and produced along a very steep learning curve (73.8 percent slope). It should also be noted that Philco's competitive unit price was far below its sole source one (\$4,036 competitive as compared to \$12,318 sole source).

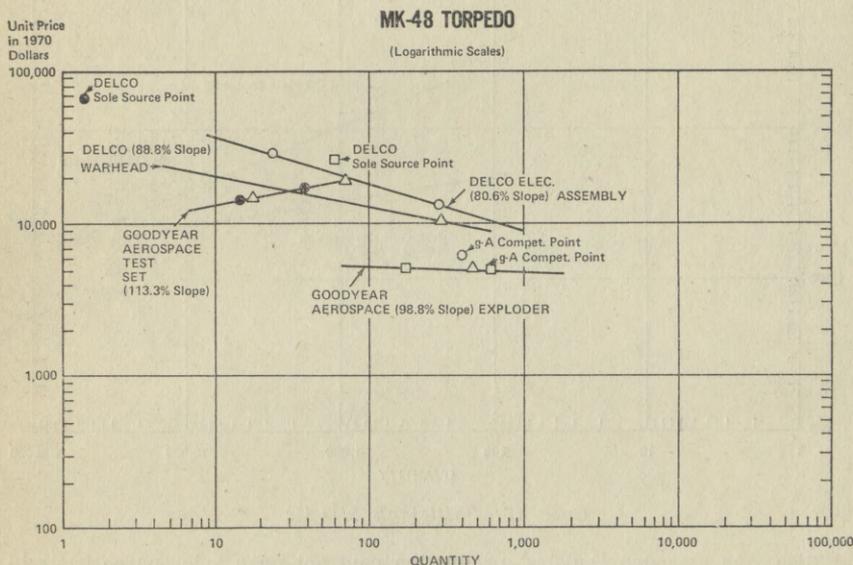
When the Shillelagh has competed, Martin also won a part of the production market. Its 1966 unit price was less than Philco's, but it received a contract to produce far fewer missiles (\$4,036 unit price for Philco as compared to \$2,649 unit price for Martin). Possibly, although Martin's bid was lower, it was not sufficiently tooled-up to meet the government's demand. Philco could, and therefore it received the larger contract regardless of its higher bid. Throughout the entire production run, Martin only produced about one-seventh the number of Shillelaghs as Philco. It, too, produced along a fairly steep learning curve (90.6 percent slope).

We see here that the switch from sole source to competitive has again brought with it significant price reductions. Unit prices fell from \$12,318 to \$4,036 for Philco and \$2,649 for Martin. It is impossible to draw any conclusions about competition's effects on learning curve slope, because there is no sole source learning curve. The competitive learning curves are unusually steep however.

This occurrence is likely due to the repetition of competition that was implemented after the initial, competitive buy. Use of competition on each subsequent buy forced the competitors along a steep curve in order that they maintain unit prices that were competitive with the other's.

## SHILLELAGH MISSILE

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Philco	-----	1/66	1,393	SS	\$12,318	\$14,141
		11/66	16,552	C	4,036	4,484
		3/68	21,846	C	2,563	2,673
		10/68	35,903	C	1,814	2,015
Martin	-----	12/66	4,960	C	2,649	3,041
		12/68	7,540	C	2,287	2,385



Case 14, 15, 16, 17: MK-48 Torpedo—Warhead, Exploder, Electric Assembly, Test Set

The MK-48 Torpedo system gives us several components that have been purchased both sole source and competitive. Unfortunately, of the four systems that will be investigated here, none has both sole source and competitive learning curves. On all of these cases, we can draw conclusions only on the effect of competition on unit price level.

*Warhead.*—Delco was awarded the first contract for the MK-48 warhead in May of 1970 on a sole source basis. It controlled the market for a total of three buys. Over that time, Delco produced along an 88.8 percent slope learning curve and was able to reduce its units price from \$15,500 to \$11,019. In 1972, the Defense Department decided to compete the production of the warhead. Goodyear Aerospace won that competition with a bid of \$5,355. Unit price was reduced by more than 50 percent due to the change in procurement method.

*Exploder.*—Delco produced the MK-48 exploder on a sole source basis for only one year, 1970. Its unit price for that buy was \$25,800. In 1971 the Defense Department competed this item. That competition was won by Goodyear Aerospace with a bid of \$5,319. Goodyear had only one other buy but did not reduce its price significantly. Its learning curve had a slope of only 98.8 percent. We see again an extremely large unit price reduction accruing to the decision to use competition. Unit price fell almost 75 percent in the case of the exploder.

*Electric assembly.*—Delco was awarded a sole source production contract in

June 1971. It produced only one more lot but showed a significant unit price reduction for it (\$29,921 on the first contract as compared to \$13,356 on the second). Delco produced along an 80.6 percent learning curve. In 1972 the item was competed; the competition was won by Goodyear Aerospace. Goodyear's bid was \$6,027, well below Delco's lowest price, \$13,356. Competition again brought with it significant price reductions.

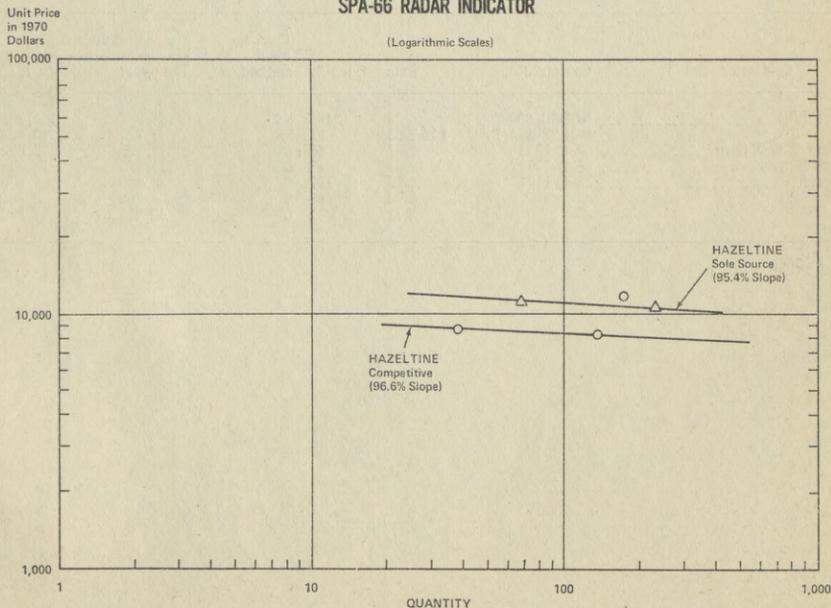
*Test set.*—Delco was the sole source producer for the MK-48 test sets. It had only one production run of four items at \$69,525 unit price. Goodyear Aerospace won the competition for production of the sets. Its bid price was \$15,156, well below Delco's sole source price. Goodyear's unit price for the test set rose to \$18,460 for its second buy but this was probably due to the low lot size for that buy (6 units). Because of its rising unit prices, Goodyear Aerospace's learning curve had a slope of \$113.3 percent.

In all cases analyzed here, the change in procurement method from sole source to competitive brought with it very large price reductions. For reasons previously noted, no conclusions on changes in learning curve slope can be drawn from these cases.

## MK-48 TORPEDO

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
<b>Warhead:</b>						
Delco	70-C-1213	May 20, 1970	48	SS	\$115,500	\$15,500
	71-C-1310	June 28, 1971	47	SS	19,970	19,391
	72-C-1208	Dec. 8, 1971	457	SS	11,348	11,019
Goodyear, Aerospace	73-C-1207	Dec. 7, 1972	480	C	5,355	5,087
<b>Explosive:</b>						
Delco	70-C-121	May 20, 1970	58	SS	25,800	25,800
Goodyear	72-C-1201	July 19, 1971	546	C	5,319	5,165
Aerospace	73-C-1207	Dec. 7, 1972	417	C	5,308	5,043
<b>Electric assembly:</b>						
Delco	71-C-1310	June 28, 1971	71	SS	29,921	29,053
	72-C-1208	Dec. 8, 1971	546	SS	13,755	13,356
Goodyear, Aerospace	73-C-1207	Dec. 7, 1972	417	C	6,344	6,027
<b>Test set:</b>						
Delco	70-C-1213	May 20, 1970	4	SS	69,525	69,525
Goodyear	72-C-1201	July 19, 1971	34	C	15,156	14,717
Aerospace	73-C-1207	Dec. 7, 1972	6	C	18,460	17,537

## SPA-66 RADAR INDICATOR



## Case 18: SPA-66 Radar Indicator

The SPA-66 is a 12-inch to 15-inch radar indicator.

Hazeltine was awarded the first production buy in 1963 on a sole source basis. It produced the SPA-66 for only one contract, including some option. The next procurement came four years later, 1967. In that year, procurement method was changed from sole source to competitive. However, unit price did not fall. Dero Research and Development won the competition with a bid of \$13,022 (in 1970 dollars), well higher than Hazeltine's lowest price of \$10,462 (1970 dollars). Dero produced only 56 indicators. Gulf Aerospace won another competition later in 1967. Its winning bid was \$12,208 (1970 dollars). Gulf, due to corporate difficulties, was never able to deliver the 73 SPA-66's that it was contracted to produce. The order remained inoperative for several years. In 1970, Hazeltine won the competition and once again produced the SPA-66. Its unit price was \$8,800, far lower than any previous unit price. Not only did it receive the competitive contract, but it was also permitted to assume the aborted Gulf Aerospace contract. For the purpose of this analysis, we will study the learning curve and price history of only the Hazeltine sole source and competitive production runs. There are two reasons for this decision. First, Hazeltine was the only company that had more than one competitive buy. Second, Hazeltine was the only company that ever had a significantly long production run for the SPA-66.

Hazeltine was awarded the first production contract for the SPA-66 on a sole source basis. It produced for only two buys and showed little price reduction over its production run (\$11,366 on the first buy which fell to \$10,462 on the next). The learning curve was necessarily very flat (95.4 percent slope).

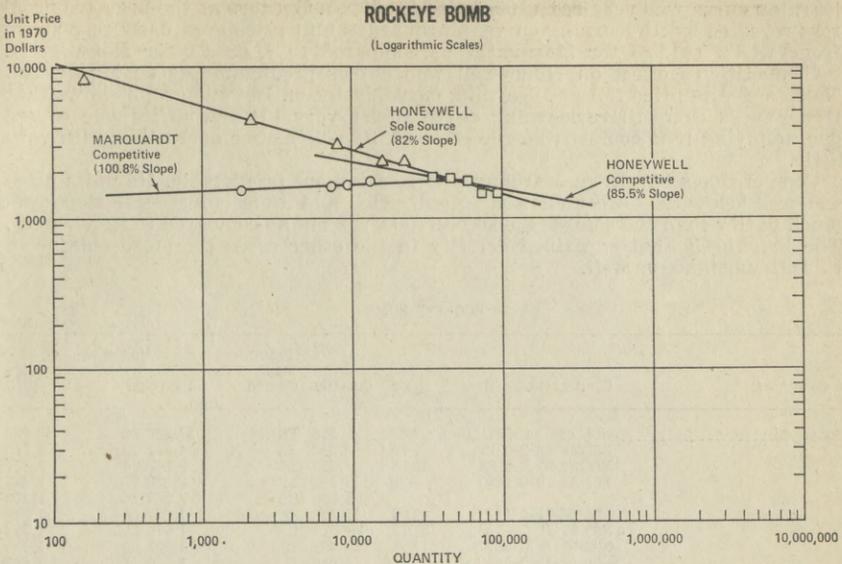
Seven years passed before Hazeltine regained the contract for the SPA-66. Its unit price was far lower than its previous lowest production price (\$10,462 as compared to \$8,800). Again we note the characteristic of flatter learning curve accompanying the lower price. Here we see the learning curve slope flatten from 95.4 percent to 96.6 percent. To be sure, neither curve demonstrates significant progress effects. Regardless though, the competitive slope demonstrates less learning than the sole source one.

This case also supports the hypothesis that contends that when procurement method is changed from sole source to competitive, unit price level falls accompanied by a flattening of the learning curve. Here, price level fell from \$10,462 to \$8,800 while learning curve slope flattened from 95.4 percent to 96.6 percent.

SPA-66 RADAR INDICATOR

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
Hazeltine.....	NOBSU-89497	6/63	186	SS	\$8,388	\$11,366
	NOBSR-89497	<sup>1</sup> 10/7/63	91	SS	7,721	10,462
Dero R. & D. Corp.....	67-C-1273	2/67	56	C	11,120	13,022
Gulf Aerospace.....	68-C-1098	12/67	73	C	10,425	12,208
Hazeltine.....	70-C-1404	6/70	102	C	8,800	8,800
		6/70	68	C	8,200	8,200
		6/71	1	C	12,411	11,890

<sup>1</sup> Option.



#### Case 19: Rockeye Bomb

Unlike our other cases, competitive procurement did not affect the production process of the Rockeye Bomb, as it did in other cases. To be sure, Marquardt entered the market as a second source primarily because DOD decided it should for logistics reasons. And also its price was competitive with Honeywell's. But the competition itself had no effect on Honeywell's unit prices. Regardless of Marquardt's influence on the market, Honeywell produced essentially along its sole source learning curve. While competition had a predictable effect on Marquardt, it had far less of one on Honeywell.

Honeywell was awarded the first production contract for the Rockeye Bomb on a sole basis in 1967 and continued its production through 1970, covering five contracts. Each one was negotiated at a lower unit price than the one before it. These price economies necessarily reflect production along a steep learning curve (82 percent slope). Honeywell's prices ranged from \$7,200 on its first contract to \$2,309 on its last.

In 1971, DOD decided to bring in a second source and therefore competed the Rockeye Bomb. Regardless, Honeywell held tight to its share of the production market. Its unit price fell from \$2,309 to \$1,937.96. Its competitive production run also revealed a strong price reducing trend—with a range from \$1,937.96 to \$1,660. Honeywell produced along an 85.9 percent learning curve.

Marquardt was awarded part of the Rockeye production when the Defense Department sought a second production source. Its unit price was well below the lowest sole source unit price (\$2,309.34 for Honeywell as compared to \$1,690.16 for Marquardt). And as would be expected, Marquardt's competitive

learning curve was very flat (100.8 percent slope). Because of the negative progress revealed by its learning curve, Marquardt's unit price eventually rose above Honeywell's (\$1,825 for Marquardt as compared to \$1,686.21 for Honeywell).

Competition's effect on Honeywell was not as predictable as on Marquardt. To be sure, its price fell and learning curve flattened. But the graph shows that Honeywell's competitive learning curve varies very little from its sole source one, implying that competition forced it off its sole source operations path very little.

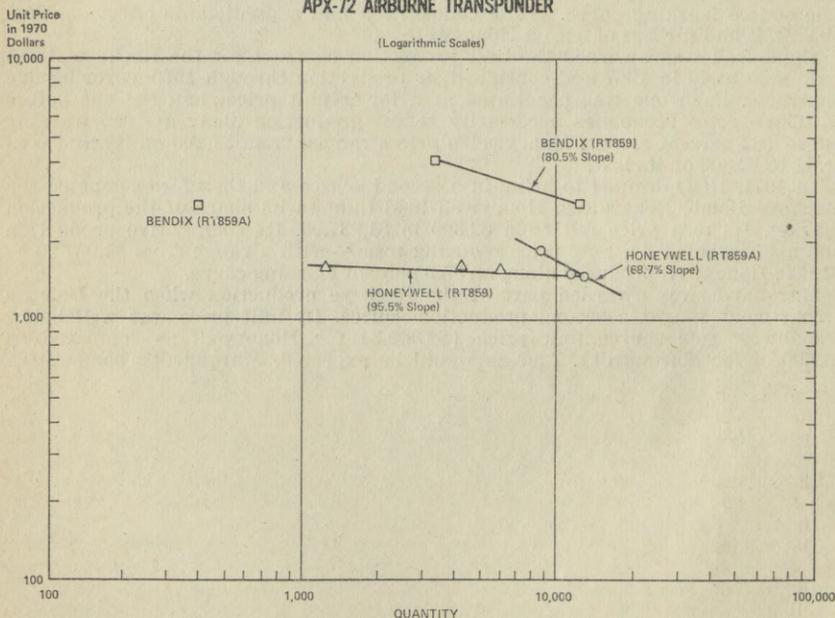
Competition's effects on Marquardt were far more predictable. Its units price was well below the lowest sole source unit price, and its learning curve slope was much flatter than the sole source slope (100.8 percent as compared to 82 percent). The hypothesis that explained activity in the other cases therefore obtains in this circumstance as well.

## ROCKEYE BOMB

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price		
					Then year	1970	
Honeywell.....	N00123-67-C-2051	4/67	535	SS	\$7,200.00	\$8,021	
	N00019-68-C-0215	2/68	4,270	SS	4,143.00	4,470	
	N00019-69-C-0163	10/68	7,150	SS	2,892.64	3,121	
	N00019-70-C-0140	7/70	18,100	SS	2,343.72	2,344	
				15,800	SS	2,309.34	2,309
	N00104-71-C-A037	10/71	18,058	C	1,937.96	1,882	
	N00104-71-C-A037	12/71	19,029	C	1,970.00	1,738	
	N00104-72-C-A027	12/71	13,431	C	1,822.00	1,769	
	N00104-72-C-A060	5/72	4,000	C	1,686.21	1,602	
	N00104-72-C-A073	2/73	2,500	C	1,660.00	1,540	
	N00104-72-C-A021	5/73	28,098	C	1,660.00	1,540	
	Marquardt.....	N00104-71-C-A083	7/71	5,000	C	1,690.16	1,641
		N00104-72-C-A054	4/72	2,500	C	1,690.16	1,606
N00104-72-A054			14,500	C	1,690.16	1,606	
N00104-72-C-A072		8/72	3,500	C	1,825.00	1,734	

1 Option.

## APX-72 AIRBORNE TRANSPONDER



## Case 20: APX-72 Airborne Transponder

The APX-72 is an airborne transponder used on all DOD aircraft and various Naval vessels.

**Bendix:** Bendix was the first producer of this item, number RT859. Its learning curve shows an 80.5 percent slope and is derived from points representing two government buys. The RT859 was later modified to correct problems with a warning light due to a malfunctioning mode four board. For the new model, RT859A, there was only one government buy. The price was about equal to the price for the last RT859 purchased. Because of the design change, Bendix's strong learning effect was halted.

**Honeywell:** Honeywell began production of the RT859 in 1970. As can be seen from the learning curve labeled "Honeywell (RT859)," the company's first-unit price is considerably less than that of Bendix, but the learning curve slope is much flatter (98.5 percent as compared to 80.5 percent). Further, to support the belief of an approximate 98 percent learning curve for Honeywell, all Honeywell production points are plotted. Only the point representing the first RT859A production is omitted, because we believe that the \$1,877.90 unit price would hide the learning effects experienced at all other points by Honeywell. The reason for this high initial price is due to retooling for production of a slightly new design. After the adjustment, learning reappears at Honeywell's usual 98 percent rate.

This case again proves that the switch in procurement method from sole source to competitive brings significant price reductions but also a flattening of the learning curve.

APX-72 AIRBORNE TRANSPONDER

Contractor	Contract No.	Date	Quantity	Procurement method	Unit price	
					Then year	1970
<b>Bendix:</b>						
RT859	NIW-66-0637	10/9/69	10,887	SS		\$4,150.71
RT859	N00019-70-C-0471	10/70	2,363	SS	\$2,766.30	2,766.30
RT859A	N00019-70-C-0471	10/70	1,150	SS	2,706.97	2,706.97
<b>Honeywell:</b>						
RT859	N00019-70-C-0370	2/3/70	3,373	C	1,653.00	1,653.00
RT859	N00019-70-C-0370	12/31/70	1,687	C	1,630.00	1,630.00
	Lot 1 Option					
RT859	N00019-70-C-0370	6/21/71	1,500	C		1,585.75
	Lot 2 Option					
RT859A	N00019-70-C-0370	6/21/71	3,798	C		1,877.90
RT859A	N00019-70-C-3070	3/6/72	3,202	C		1,561.78
	Lot 3 Option					
RT859A	N00019-70-C-0370	1972	469	C		1,537.05

## CONCLUSION

## MORE COMPETITION, A BOON FOR THE DEFENSE DEPARTMENT

Early in the study, I mentioned that the Department of Defense usually activates a few arguments against the implementation of competitive procurement. But these twenty cases powerfully refute them. The Industrial College of the Armed Forces says that advertised bidding is almost impossible for electronics, missiles, and other sophisticated weapons and equipment. Since several cases involved competitive procurement of just the material the military said could not be bought that way, the validity of the argument is very suspect. Complex and expensive electronics like the TD-204 cable combiner, TD-202 radio combiner, TD-352 and TD-660 multiplexers, and 60-6402 electric control were all purchased competitively and showed significant price reductions due to the use of that procurement method. The same results apply to the procurement of the Standard 66A and 57A missiles, the Shillelagh missile, the Talos missile, and the Hawk missile. Competition is both a viable and desirable procurement method for purchasing technologically complex equipment.

The military argues that often only marginal producers are interested in the low profit business of competitive procurement, which would result in poor quality goods for DOD and possibly higher than normal prices. Again the cases conclusively reject this assertion. Winners of the competitive bids include such large and prominent corporations as Honeywell, Maxson, Hazeltine, Bendix and General Dynamics. Certainly none of this group could be characterized as marginal producers. Top quality manufacturers want the Defense Department's business regardless of the way DOD buys from them.

The last major argument against the use of competition is that it takes too long to implement the process in times of emergency. Surely war should be a condition sufficient to warrant description as an emergency. But in many of the cases, we find that complex equipment was purchased competitively during the height of the Vietnamese conflict. The Hawk was competed in 1964, the AN/SQS-23 208A in 1967-1973, the TD-204 and TD-352 in 1968 and 1969, the TD-202 in 1967 and 1968, the TD-660 in 1969, the Talos and Shillelagh missiles in 1966-1968, and both of the Standard missiles were competed in 1967-1971. The procurement histories of these systems provide convincing evidence that competition can be used effectively even in times of severe emergency such as the war in Vietnam.

Beyond refuting these three arguments, the case studies have provided a rule that applies in virtually all cases where the switch from sole source to competitive takes place. When procurement method is changed from sole source to competitive, notable price reductions will occur but will be accompanied by a flattening of the learning curve. The two tables in this chapter review the basic data that lead to this hypothesis. In virtually each case large price reductions resulted from the change in procurement method. Competition brought the second lowest price drop in the procurement of the Rockeye Bomb; Honeywell's competitive price fell by only 19 percent. The lowest was a 16 percent price reduction in the procurement of the SPA-66 radar indicator. But even these are large reductions in price level. All of the cases showed an average price reduction of 51.9 percent, which easily offsets the flattening of the learning curve. Savings from competition would remain great in most cases even assuming prices would decline along the learning curve of the sole source purchases.

If an average reduction of that size can be achieved, there is no excuse why procurement officers should not always strive for it. And if competition is the way to achieve it, it should be implemented. Any lesser action cheats the American taxpayer.

Two other points may be culled from the case studies. From the procurement of the Bullpup 12B Missile, we see that when a learning buy is used. DOD experiences price economies. But it maximizes those reductions when it implements winner-take-all competition. In this case, unit price fell when the Bullpup was procured competitively from both Maxson and Martin, but it fell most dramatically in response to the decision to award Maxson all of the production on a competitive basis. This case and the Shillelagh Missile one lead to another conclusion. By competing the weapon on each successive buy, and by giving part of the production to the two competitors, the sole source company was forced to maintain a steep learning curve in order to keep its share of the market. In this way, the Defense Department could experience large price reductions and also avoid the flattening of the learning curve that usually accompanies the change in procurement method.

We see, then, that by switching to competitive procurement, sizeable unit price reductions will be experienced. The competitive learning curve is usually flatter, but the large price reductions more than offset the reduced progress in the operations. Also all twenty cases demonstrate conclusively that three of the Defense Department's strongest arguments against the use of competition are simply not valid. It is not only possible to use some form of competitive procurement for complex systems, but also no excuse for not using it should be accepted unless solid reasoning has been established against its implementation. Not until DOD is able to convince Congress that competition is impossible, should it be allowed to negotiate any equipment on a sole source basis. And also Congressional criteria for deciding competition's impossibility should be vigorous and unyielding to the Defense Department's usual excuses. The case studies prove that this action is surely warranted, since in each circumstance conscientious procurement on the part of the purchasing agent saved the government hundreds of millions of dollars. And the American taxpayer deserves Congressional assurance of serious achievement of such economy in government. Nothing else is acceptable.

TABLE I

System	Contractor	Last sole source contract No.	Date	Unit price		1st competitive contract No.	Date	Unit price	
				Then year	1970			Then year	1970
60-6402 elec. control	General electric.	3365F7-67C-0395-P01Z.	June 5, 1968	\$6,314.00	\$6,977.00	F33657-69C-065Z and P013.	January 15 and May 12, 1963.	\$2,900.00	\$3,030.00
AN/SQS-23-208A transducer.	Massa, Division of Dynamics Corp. of America.	67-C-1406	May 16, 1967	65,700.00	75,883.50	69-C-1084	Oct. 25, 1967	36,926.00	40,249.34
Rockeye bomb	Honeywell	N00019-70-3-0140	July 1970	2,309.34	2,309.00	N00104-71-C-A037 N00104-71-C-A083	October 1971 July 1971	1,937.96 1,690.16	1,882.00 1,641.00
MK-48 torpedo:									
Warhead <sup>1</sup>	Delco	72-C-1208	Dec. 8, 1971	11,313.00	11,019.00	73-C-1207	Dec. 7, 1972	5,355.00	5,037.00
Explosive <sup>2</sup>	do	70-C-1213	May 20, 1970	23,300.00	23,300.00	72-C-1201	July 19, 1971	5,313.00	5,165.00
Electric assembly	do	72-C-1203	Dec. 8, 1971	13,755.00	13,356.00	73-C-1207	Dec. 1, 1972	6,344.00	6,027.00
Test set.	do	70-C-1213	May 20, 1970	63,525.00	63,525.00	72-C-1201	July 19, 1971	15,156.00	14,717.00
Standard missile:									
ER-RIM-67A.	General Dynamics.	N00019-70-C-0471	Fiscal year 1965	128,005.00	149,765.00		Fiscal year 1967	53,921.00	61,039.00
ER-RIM-66A	do			128,005.00	149,765.00			53,207.00	60,230.00
APX-72	Bendix	N00019-70-C-0471	Oct. 1970	2,706.30	2,759.30	N00019-70-C-0370	Feb. 3, 1970	1,553.00	1,633.00
Hawk motor metal parts.	Aerofast General Corp.	ORD-1052	Fiscal years 1959, 1961	1,244.00	1,778.00	A MC-01432	Fiscal year 1964	673.00	831.00
TD-362 multiplexer	Raytheon	04878	1968	9,361.00	10,263.00	1225-B	1963	3,912.00	4,291.45
TD-204 cable combiner	do	04878	1968	3,423.00	3,595.00	1225-B	1963	1,711.00	1,877.03
SPA-66 radar indicator	Hazeltine	N06SR-89497 option.	Oct. 7, 1963	7,721.00	13,432.00	70-C704	June 1970	8,831.00	8,800.00
Bullpup 12-B missile	Martin		Fiscal year 1961	3,802.00	4,969.00		Fiscal year 1961	2,848.00	3,725.00
Shilleagh	Philco		January 1966	12,318.00	14,141.00		Fiscal year 1964	1,227.00	1,474.00
TD-660	Raytheon.	1012	1969	5,693.00	5,949.00	1036	November 1966	4,036.00	4,484.00
TD-202 radio combiner	do	04878	1968	3,058.00	3,365.60		December 1966	2,649.00	3,041.00
Talos missile	Bendix	NOW-65-0227	Fiscal year 1965	135,658.00	159,263.00	NOW-65-0272	1967	3,375.00	3,522.00
ARA-63 rad. rec dec set.	AIL Co.	N00024-69-C-1300	1969	7,540.00	7,849.14	ASC Systems Corp.	Fiscal year 1966	80,300.00	92,249.00
							1972	3,146.54	2,882.23

1 ER RIM67A. 2 MR RIM66A.

TABLE 2

System	Percent unit price reduction	Learning curve slope (percent)	
		Sole source	Competitive
Hawk motor metal parts	50	87.4	98.9
TD-352 multiplexer	58	95.8	98.0
TD-204 cable combiner	50	86.6	96.0
SPA-66 radar indicator	16	95.4	96.6
Bullpup 12-B missile	125	83.3	179.9
	270		290.2
Shillelagh missile	168		173.8
	279		290.06
TD-660	41	70.8	96.6
TD-202	31	82.8	90.5
Radio combiner Talos missile	42	93.3	77.3
ARA-63	63		
Radio Rec-dec. set 60-6402 electric control	56	95.7	103.8
AN/Sqs23 208A transducer	47		88.2
Rockeye bomb	119	82.	185.9
	229		2100.8
MK-48 torpedo:			
Warhead	54	88.8	
Exploder	80		98.8
Electric assembly	55	80.6	
Test set	79		113.3
ER RIM67A	59		85.6
MR RIM66A	60		91.2
APX-72	40	80.5	98.5

<sup>1</sup> ER RIM67A.

<sup>2</sup> MR RIM66A.

Chairman PROXMIRE. Thank you, Mr. Yuspeh. Mr. Fitzgerald, please proceed.

**STATEMENT OF A. E. FITZGERALD, CONSULTANT, AND FORMER DEPUTY FOR MANAGEMENT SYSTEMS, OFFICE OF THE ASSISTANT SECRETARY OF THE AIR FORCE**

Mr. FITZGERALD. Thank you, Mr. Chairman.

In my statement today I would like to comment on three particular items rather than two, as I mentioned in my prepared statement, with your permission. I would like to add to the discussion of Mr. Yuspeh's fine study and to the Army Materiel Command should-cost study some comments on the should-cost presentation by the Comptroller General yesterday, and some other information that we have received on this.

**ENORMOUS POTENTIAL FOR COST REDUCTION IN MILITARY PROCUREMENT—  
SOME OBSTACLES TO OVERCOME**

First, I would like to say that I think that Mr. Yuspeh's study is one of the most revealing and potentially useful studies ever presented to this subcommittee. I think the facts in his study demonstrate conclusively that there is enormous potential for cost reduction in military procurement. And I would hope that a majority of the Congress and the proponents of good stewardship in the administration will concentrate on ways of capturing this saving potential, and not be deterred or become preoccupied with the obstacles, genuine or contrived, to wider use of competition.

I think it useful to recognize that there are some genuine obstacles. Mr. Yuspeh has alluded to one of them when he mentioned the data package problem. It is a very difficult problem to communicate requirements, work requirements, for these complex systems to a variety of

contractors. This is done primarily through engineering design specifications and supplementing documentation.

There has been a great drive in recent years to cut out the paperwork, as the expression goes, and I would be the first to say that much of the paperwork involved in the procurement business should be cut out. But it has been my observation that some of the zeal has resulted in cutting the muscle as well as the fat, to borrow a phrase. The muscle is the engineering documentation that enables you to go out for competitive bids. There is a lot of pressure from the industry, particularly the sole source homesteaders who have been on the same program for 10 or 12 years, to make themselves competition-proof. One of the ways they can do this is to avoid having the Government get usable bid packages.

#### COMPETE TENANCY OF GOVERNMENT-OWNED PLANTS

There is another problem that I think is a big obstacle in successfully competing many of our largest and most expensive programs. That is the sheer size of some of the complex military equipment and the tooling necessary to build it. Some of the specialized tooling, especially the assembly jigs for large aircraft, is truly monumental. Fortunately, I believe there is a way, or at least often there is a way, around this obstacle, too. Many of our large military planes are assembled in Government-owned factories. I believe that it would be entirely practical to hold competitions for the tenancy, for the maintenance and the management of production in these plants, even in the midst of a production run, if the need was great enough.

A classic example of a lost opportunity of this sort was the case of the Lockheed production of the C-5A transport. The C-5A, as you know, was assembled in Air Force Plant No. 6 in Marietta, Ga. A number of people now present in this room proposed allowing different management groups to compete for the management of Air Force Plant No. 6 at the time that Lockheed was threatening to default on their contracts if they did not get their way in renegotiations. The proposal for competing the tenancy was shouted down in the emotional climate at that time, but I still think it was a good idea. My feeling on this was bolstered when in testimony quoted in the July 2, 1971, staff study of Lockheed by the House Banking and Currency Committee, Mr. David Packard, who was then Deputy Secretary of Defense, stated: "I frankly would have no trouble in having somebody go down and run that plant"—he was speaking there of Air Force Plant 6—"independently of the rest of the company."

Now, from the taxpayer's point of view the tragic aspect of Mr. Packard's statement was that he apparently arrived at that conclusion only after he had approved a bailout equivalent to about four times the net worth of the company. But it is still a good idea. It has been done from time to time. The Army in the past has changed management of its so-called GOCO plants, its Government-owned contractor-operated plants, and I believe it could be done again.

Furthermore, I would suggest that the Army's experience in changing managements of the GOCO plants—the ammunition plants, the tank arsenals, and that sort of thing—be studied to remove some of the fear of the unknown involved in competing tenancy.

## CLARIFYING THE IMPORTANCE OF LEARNING CURVES

This brings me now, Mr. Chairman, to a point of clarification, I think would be the best way to term it, of Mr. Yuspeh's discussion of the learning curves. And if I could use the easel—and incidentally, you will notice a sharp decline in the quality of the charts, Mr. Chairman. Being a penny pincher, I have drawn this myself on the back of an old capitol directory, a small cost reduction.

Mr. Yuspeh mentioned the business of learning curves. I want to use this as an explanation of how we often do illogical things.

In the absence of any other information, a learning curve specialist, a purist, would look at the curve I have drawn here at the top of this chart<sup>1</sup> and say that it slopes down sharply, the improvement is quite rapid, and, therefore, it is a good curve. He had no previous experience with the articles, the new thing he is buying, or he did not have any competition, or comparative data. This weakness in logic is often taken advantage of by folks submitting bids to prepare a steep curve by inflating the starting point. It is very easy to do. All you have to have is a lot of extra people in the beginning. We are speaking here usually of man-hours per unit plotted against units produced. So I think it is easy to see that in the absence of really incisive analysis, in the sole source environment of a project such as Minuteman, or the Trident missiles or whatever, it is very easy to build any kind of curve that you want here, to jack it up very sharply, and you could show a good improvement if you were so inclined or motivated. On the other hand, what Mr. Yuspeh alluded to, and what other people have sometimes called a bad curve, a flat one, may in fact be more efficient. What counts obviously is the area under the curve, the total cost involved.

But I think there is another thing, and this begins to get to one of the points that Mr. Staats mentioned. How can we tell whether we have a lot of fat in it? Fortunately, especially in the case of factory man-hours, which is the basis on which most costs are factored or multiplied to arrive at total price, we have well-established methods of measuring the work content. And this, I think, will give you another aid to judgment in telling how much fat is left in the contract. Neither the steepness nor the beginning point in itself will tell you how much fat is in the contract.

Incidentally, I have submitted for the record—it is a little too lengthy to go into the testimony—a description of this whole process of analyzing the degree of fat, particularly in direct labor.<sup>2</sup>

## ARMY SHOULD-COST STUDY CENSORED AND ESOTERIC

Now, this is the essence of the next study that I want to comment on, the concept of measuring and quantifying work content of articles, no matter how complex. As I indicated, this is the basis of the next study, which is entitled "Review of the U.S. Army Materiel Command Should-Cost Study." It was completed on May 5, 1972. It was prepared by a contractor, Performance Technology Corp., with whom I was associated in one of my earlier incarnations before I went in the Pentagon.

<sup>1</sup> See exhibit 1, n. 2630.

<sup>2</sup> See app. A, beginning on p. 2635.

This is a long study, and somewhat esoteric. In addition, it was heavily censored by the Army prior to submittal to the subcommittee. In my opinion, the censorship was entirely unwarranted, and the Army should provide the complete uncensored study for the record of this hearing.

I believe it is important, both because of the information it contains and because it is likely that similar information is not going to be available again in the foreseeable future, for reasons that I will touch on later.

#### HOW A SHOULD-COST STUDY IS DONE

Now, I want to go to my next tightwad chart<sup>1</sup> to explain very briefly the concept of should cost that was in the minds of all of us practitioners who recommended it to your committee years ago, and perhaps to give an idea of whether we have deviated from that in recent practice.

To begin with, we usually start with a proposal which has been received from a contractor. It is stated in terms of total cost, and it is capable of being exploded or analyzed. To analyze, as I learned it, meant to take the whole apart into its components. And, of course, the standard components in cost accounting in industry are the standard labor content, and the variance from that standard labor content. This could be called the measured work content; the total of these two would be the actual labor hours projected. Then on top of that we will have material and subcontract estimates, and we will have overhead estimates, and then on top of that general and administrative expenses.

Now, all of these are present, with the exception of the split between the standard labor and the labor variance, on reports that have been received for many years in the Department of Defense, the DD-633 form,<sup>2</sup> in much greater detail than this. They are by no means proprietary. If so, there are ways of getting around it which we can get to later, if you desire.

Having taken this apart, the real guts of the should-cost operation is to squeeze the fat out of each segment, each slice of it, by whatever means are at your disposal. It is always the easiest, I think, in the factory, because for a hundred years, now, almost a hundred years, we have developed reasonably reliable methods of measuring and evaluating factory work. So that is easy. Oftentimes you will find measurement programs in use in the overhead areas and in purchasing and places like that. But you cannot count on it. So you just do the best you can in each one of these areas. It becomes very complex, depending on how deeply you want to go. Then, having squeezed the fat out of them, you then stack up the reduced cost elements, and that is the should cost.

The next step you will have is a negotiation. Typically you lose a little something. Following that, it is possible to track actual cost on the same basis as you have analyzed, evaluated, and stacked up for should cost. Oftentimes the negotiated costs are negotiated as a lump.

<sup>1</sup> See exhibit 2, p. 2631.

<sup>2</sup> See app. B, beginning on p. 2648.

As a matter of fact, that is usually the case, except that both parties have an idea of what they had in mind and go back and write memoranda, pricing memoranda, to show the rationale for arriving at the price.

So we can easily track the progress of these things through the initial analysis evaluation of should cost and negotiation in actuals. That is why I am puzzled when I hear the Comptroller General say that they cannot quantify the changes that have taken place. The fact is, Mr. Chairman, that what is being done now in most of the so-called should-cost applications is not this. In particular, we are not, at least as far as we can tell in this committee, getting the kind of analysis or the measurement operations that we should be getting.

I would like to mark as exhibits some examples of how this has been done in the past.

#### SQUEEZING THE FAT OUT OF THE STANDARD MISSILE

Could I pass this to the chairman? This is an example<sup>1</sup> of squeezing the fat out of the basic standard content, which would be the bottom item on the bar of my second chart.<sup>2</sup> The circled items are the amount of standard time that was reduced. In other words, we found—this was a job that some of my associates and I did back in 1964 on the Standard missile while it was in development, as a matter of fact. This is one of the success stories of Mr. Yuspeh's presentation. You can see that the data was highly developed even at that point, and readily available to us. We had no problem getting it and we furthermore had no difficulty in adjusting the standards to what we considered reality.

We also could get a good measure of the amount of efficiency loss that could be expected. The difference in the line labeled "Standard Hour Content" and the top of the bars here<sup>3</sup> is a measure of the efficiency variance, that I have shown on that chart.<sup>4</sup>

As you can see, this was a reasonably good operation for the aerospace business at that time—40, 50, and 60 percent efficiency. That was not true in other areas. Exhibit 5<sup>5</sup> that I will mark for the record shows some of the worst that I ever encountered. You will see on this—this is a list of labor efficiency figures, the efficiency figures are those underlined—at the Autonetics division of North American Aviation, now Rockwell International. You can see that they range on individual items from—I think the lowest I see on an actual efficiency is 3.2 percent, and on occasion they worked up to a peak of frenzy of 14.1 percent of normally expected efficiency.

Now, right away you have to suspect that there is room for improvement in things like this. And there is, of course.

This table<sup>6</sup> illustrates the way basic quantification can be done, Mr. Chairman, and should be done. The information is quantitative, it should not be qualitative, and there is no problem on proprietary data, especially if the Comptroller General clauses in contracts are invoked. It can be successful. It has been done for many years.

<sup>1</sup> See exhibit 3, p. 2631.

<sup>2</sup> See exhibit 2, p. 2631.

<sup>3</sup> See exhibit 4, pp. 2632-2634.

<sup>4</sup> See exhibit 2, p. 2631.

<sup>5</sup> See exhibit 5, p. 2635.

<sup>6</sup> See exhibit 3, p. 2631.

I will mark as the next exhibit,<sup>1</sup> another old success story, a "should-cost" project—though we didn't call it that in those days—performed 4 years before the Pratt and Whitney exercise was done.

A \$400 TELEVISION FOR \$8,000—COMMENT ON CONTRACTOR INEFFICIENCY

Now, how can we measure from the standpoint of outsiders, how can we assess the effectiveness of efforts to squeeze the fat out of these contracts? I think a good technique is shown in the table of my prepared statement, which I extracted from the Army should-cost study. Page 9 of the Army study showed—and this, incidentally, was an accident of the censor apparently, because even though the contractor names and much other pertinent data were taken out of the earlier parts of the study, this was left in. It is simply a comparison of in-house contractor cost to the measured output of work. That is what the standard work is, measured output. To call it a standard hour is very confusing, because it has nothing to do necessarily with the passage of time. It is a unit of work output. They have simply divided the total cost, in this case the total in-house cost of the Government's position by the standard hour content, and come up with a figure, dollars per unit of output, per standard labor hour. This ranged from a low of \$19.52 for the best contractor who was reviewed to a high of \$195.33 per standard labor hour for the worst.

Now, what does this mean in practical terms? The typical commercial producer today probably begins to panic a little bit when his total cost of producing a standard hour's worth of work gets in the \$8 to \$10 range. I am sure he would be in a little trouble if it got above \$10. So we see here that the very best that we have is almost twice the cost level expected—or even tolerable, I think—in commercial activities, and the worst is about 20 times as bad. The worst is an electronic manufacturer. To bring this down to an everyday understandable level, Mr. Chairman, this would mean that if a typical \$400 television receiver were built at this efficiency level, at the efficiency level shown here—and I want to emphasize here that I do not know whether these numbers are valid or not, but they match others I have seen—the consumer, assuming the markups remain the same, would have to pay \$8,000 or so for that item. I think this has the most profound implication for our economy, for our competitive position in world markets, and if you are looking ahead a bit, the convertability of these companies to civilian work. There is no way that they can compete at this level of efficiency. They must continue to get work from the Government.

ATTEMPTS TO UNDERMINE SHOULD-COST EFFICIENCY

I am afraid that the qualitative approach to should-cost that has been taken has effectively converted it to a sterile, nonproductive overhead type function as far as the Department of Defense is concerned. I have no confidence whatever that real hard savings of the sort that should be attained and could be attained through competitive actions such as Mr. Yuspeh has described are being attained regularly. I do not deny that there has been some good come out of them, I think there

<sup>1</sup> See exhibit 6, p. 2635.

has. But there has been tremendous pressure to convert the should-cost approach from an incisive, quickly done, quantitative analysis to a long, drawn-out, vague, qualitative review of system and procedures—which is precisely the reason that the Comptroller General has difficulty putting numbers on them. If he went through the process correctly he would have no problem whatever in putting price tags on the results of the activity. But be that as it may, I think the emasculation has happened. My suspicions are heightened by the fact that the Army, which previously bragged about their success in these areas, is now censoring all practical results that would have appeared in the study, with the exception of what got through accidentally.

I would like to suggest to this committee that unless you can get numbers that give you confidence that we are indeed getting the savings attainable, that you give consideration to having scarce staff time directed elsewhere. I think that it is entirely possible to develop the standard hour figures and to build your own indices, if you can get the information.

Now, I have overrun. And I would like to reserve my general comments, if I may, Mr. Chairman, to the question and answer period.

[The exhibits and appendixes referred to in Mr. Fitzgerald's oral statement, and the prepared statement of Mr. Fitzgerald follow:]

## EXHIBIT 1

### LEARNING CURVE COMPARISON LOGARITHMIC SCALE

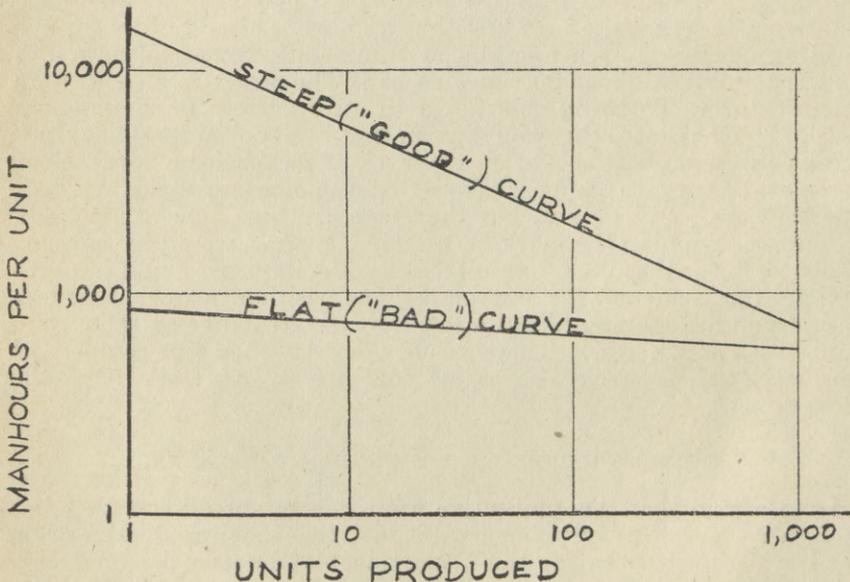


EXHIBIT 2

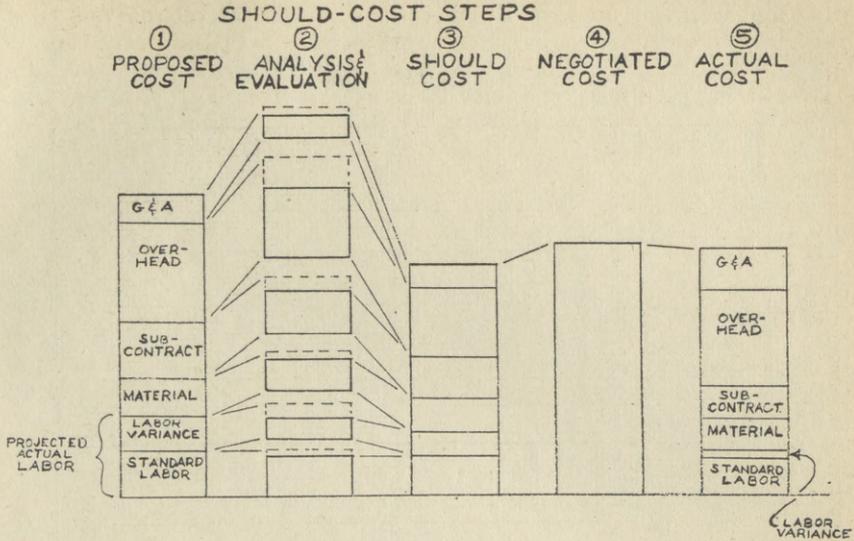


EXHIBIT 3

STANDARD MISSILE, TYPE I—STANDARD HOUR DISTRIBUTION BY FUNCTION BY END ITEM

	Machiu shop D/51	Proc- essing D/53	Mechani- cal assembly D/61	Elec- tronics D/63	Test D/63	Total
<b>MR version:</b>						
G.C. & O. final assembly .....		3.570				3.570
Guidance section .....	33.977	11.608	14.873	209.329	57.047	326.834
Ordnance section .....	13.229	4.519	5.791	96.441	15.201	135.181
Autopilot section .....	3.729	1.274	1.633	37.581	17.850	62.067
Aft section .....	40.083	13.696	17.547	9.429	7.350	88.110
Miscellaneous items .....	51.799	17.696	22.674	28.444	1.313	121.926
<b>Total, contractor .....</b>	<b>142.822</b>	<b>52.363</b>	<b>62.518</b>	<b>381.224</b>	<b>98.761</b>	<b>737.688</b>
Test allowance .....					(42.433)	(42.433)
Estimated cycle allowance .....	(12.984)	(4.760)	(5.683)	(34.657)		(58.084)
<b>Revised total .....</b>	<b>129.838</b>	<b>47.603</b>	<b>56.835</b>	<b>346.567</b>	<b>56.328</b>	<b>637.171</b>
<b>ER version:</b>						
G.C. & O. assembly .....		3.570				3.570
Guidance section .....	33.977	11.608	14.873	209.329	57.047	326.834
Ordnance section .....	13.229	4.519	5.791	96.441	15.201	135.181
Autopilot section .....	4.064	1.384	1.797	37.581	17.850	62.676
Aft section .....	43.276	14.754	19.131	9.429	7.350	93.920
Miscellaneous items .....	61.720	21.013	27.284	28.609	1.313	139.939
<b>Total, contractor .....</b>	<b>156.266</b>	<b>56.828</b>	<b>68.876</b>	<b>381.389</b>	<b>98.761</b>	<b>762.120</b>
Test allowance .....					(42.433)	(42.433)
Estimated cycle allowance .....	(14.206)	(5.166)	(6.889)	(34.673)		(60.934)
<b>Revised total .....</b>	<b>142.060</b>	<b>51.662</b>	<b>61.987</b>	<b>346.716</b>	<b>56.328</b>	<b>658.753</b>

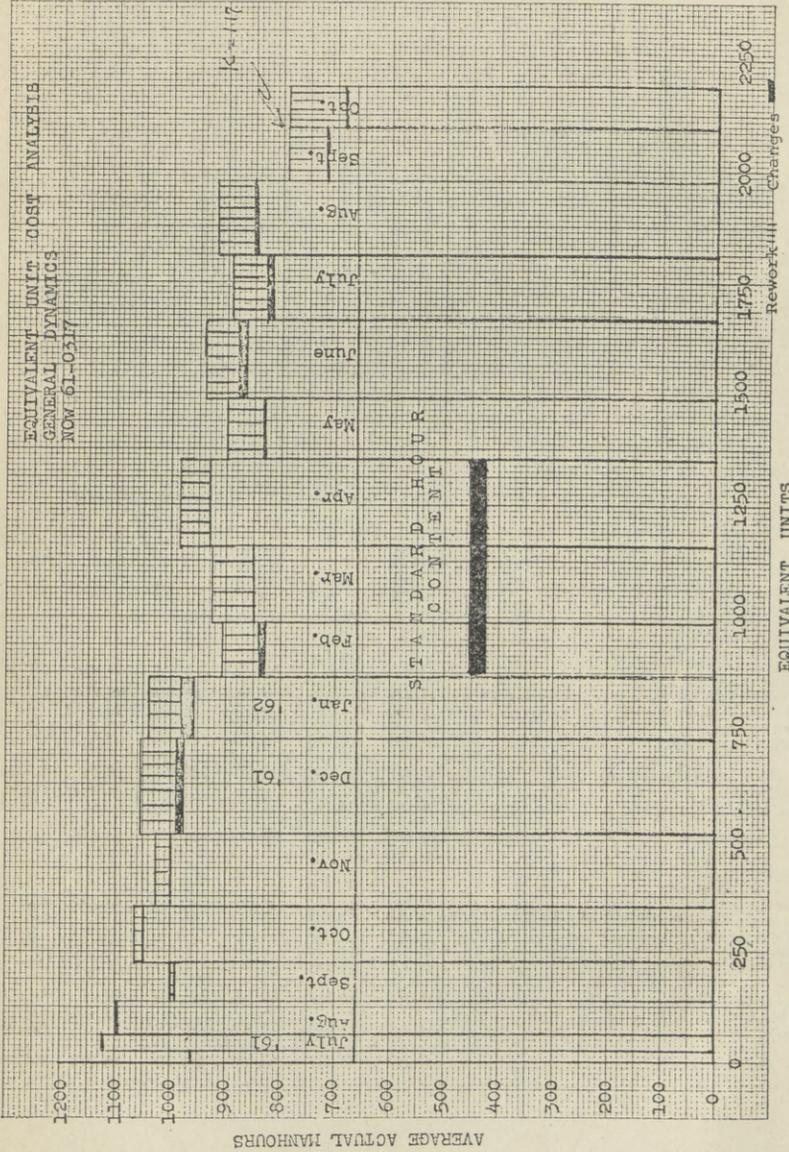


EXHIBIT 4—Continued

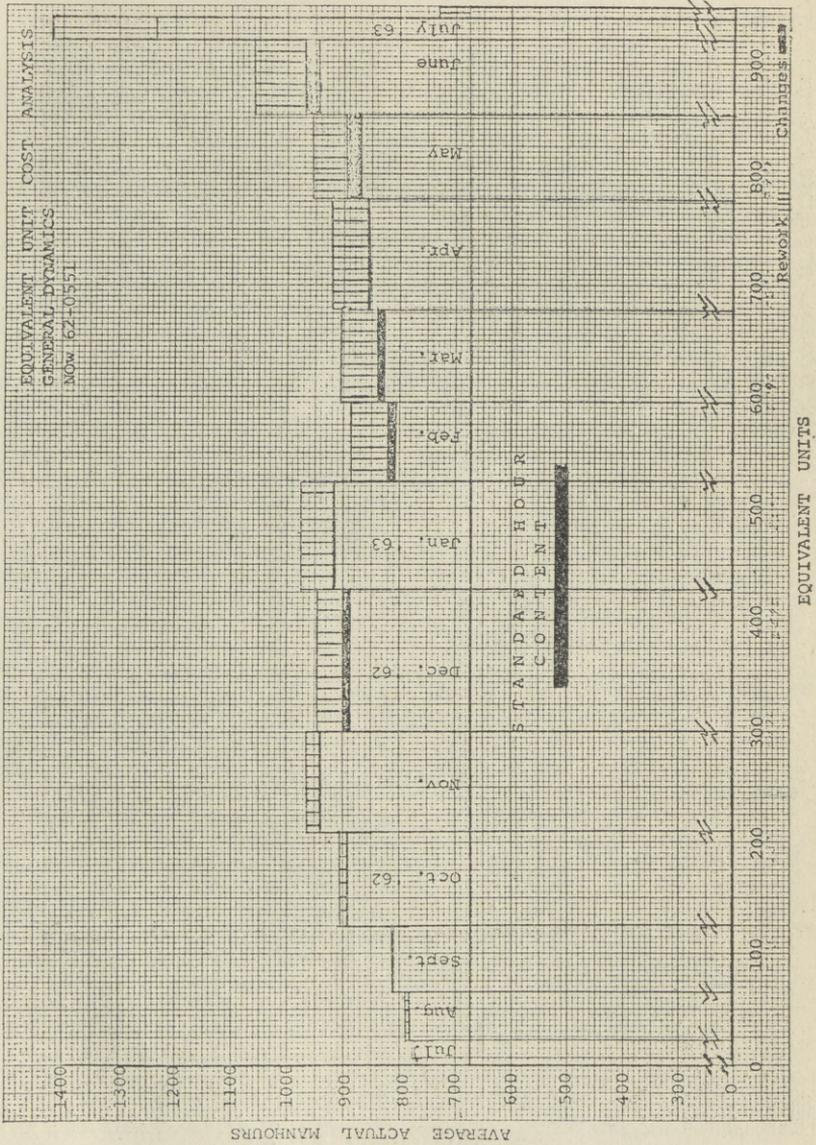
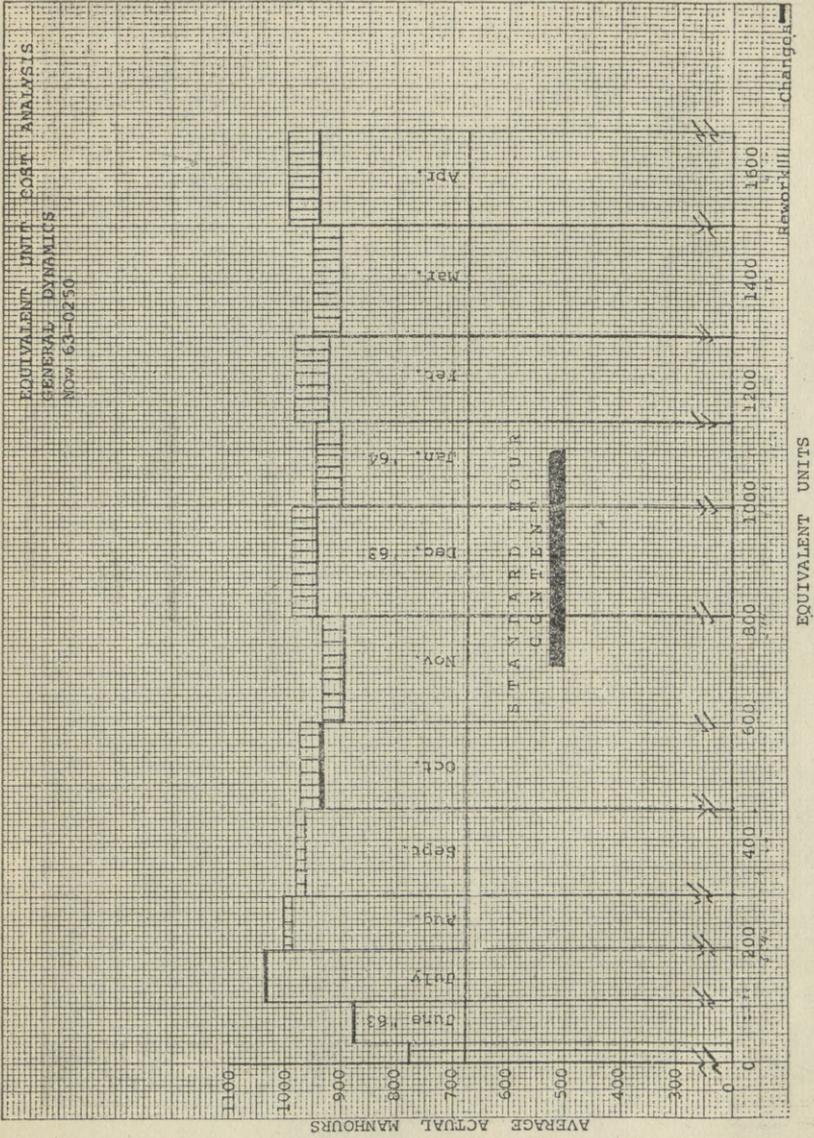


EXHIBIT 4—Continued



## EXHIBIT 5

## AUTONETICS—MINUTEMAN II—MANUFACTURING PERFORMANCE

Contract	-247						-402	
	Standard hours	Planned average hours	Actual hours			Planned		
			Unit 1	Unit 2	Unit 3	Actual unit	Hours	
Hardware end-item								
D-37B	772	9,999	(1)	(1)	(1)		(1)	
*R=(percent)		7.7						
P-92	143	1,873	6,138	4,312	4,462	60	1,183	
*R=(percent)		7.6			3.2		12.1	
D-43	40	559	1,486	1,168	1,120		(1)	
*R=(percent)		7.2			3.6			
P-68	58	706	1,016	961	1,051	49	724	
*R=(percent)		8.2			5.5		3.0	
P-91A	80	771	1,596	1,468	1,138	59	585	
*R=(percent)		11.5			7.0		13.7	
P-90	129	1,286	4,080	3,447	3,007	80	913	
*R=(percent)		10.0			4.3		14.1	
P-89	78	1,025	2,570	2,307	1,853	59	657	
*R=(percent)		7.6			4.2		11.9	
Total R=(percent)		8.0			4.2		12.0	

<sup>1</sup> Not available.

Note: \*R=Realization; R=Output, input; R=Earned hours plus applied hours; R=1:12.5 plan (-274); R=1:23.8 actual units.

## EXHIBIT 6

## MISSILE SYSTEM PROJECT—1963

	Before	After	Percent change
Manufacturing labor rate per hour	\$2.75	\$3.00	+9
Overhead rate per direct labor hour	5.10	3.85	-25
Total rate per direct labor hour	7.85	6.85	-13
Manufacturing hours per equivalent unit	(15,000)	(5,000)	-67
Labor and overhead cost per equivalent unit	117,750.00	34,250.00	-71
Standard hours per unit	(4,820)	(3,015)	-37
Dollars per standard labor hour	24.40	11.25	-54

<sup>1</sup> Later improved to less than \$9.

## APPENDIX A

## GENERAL

The Secretary of the Air Force has directed major cost reductions in our acquisition programs. He has further directed that the cost reductions are to be achieved without reduction of quantities of deployed hardware and without compromising availability, systems performance or quality. Although he has stated that he does not wish to dictate the methods to be used in achieving our financial goals, it is obvious that we must do something differently.

Secretaries Foster and Shillito have publicly deplored acquisition mistakes of the past, and have stated that we can do better in the future. We can, and it is time to get started.

One of the activities which we can always improve is our approach to estimating appropriate costs for contract pricing. The traditional methods of arriving at negotiated contract prices often fail to pinpoint avoidable costs in contractor operations. The traditional methods, while probably appropriate for projections of funding requirements by the Comptroller, are just not penetrating enough to support challenging analyses needed by contract negotiators in the new environment. Our negotiators need the support of staff cost specialists, government people resident in contractor plants and higher headquarters in identifying and, if possible, eliminating from contract prices any projected costs due to excessive discretionary expenses or contractor inefficiencies.

Discretionary expenses in contractor operations cover such things as independent research and development, marketing and advertising efforts, and staffing levels of some categories of support personnel.

Detectable inefficiencies are probably most prevalent in staffing levels. Stated in simplest terms, the inefficient contractor situation would be characterized by staffing levels in excess of those needed to perform necessary projected work.

The key, of course, to detecting such situations can be found in determinations of the requirements for necessary projected work.

Inefficiencies in contractor operations may often be detected using the outputs of the contractors' own systems, many of which we monitor routinely. Many contractors have systems for developing and displaying their industrial engineers' expectation of time which should be required by qualified personnel to accomplish their assigned tasks. While such contractor systems exist to some extent in all functional areas, they are most prevalent and well established in factory and test operations. Accordingly, practices in these areas can be examined to illustrate some fundamental features which should be included in analyses of proposed costs.

As examples of various ways of looking at projected contractor costs, it may be useful to examine some actual cases. For simplicity of explanation, the two cases which have been selected deal with factory labor hours.

### MISSILE LAUNCH FACILITIES MANHOURLY EXPENDITURES BY UNIT FAB., MINOR AND MAJOR ASSEMBLY

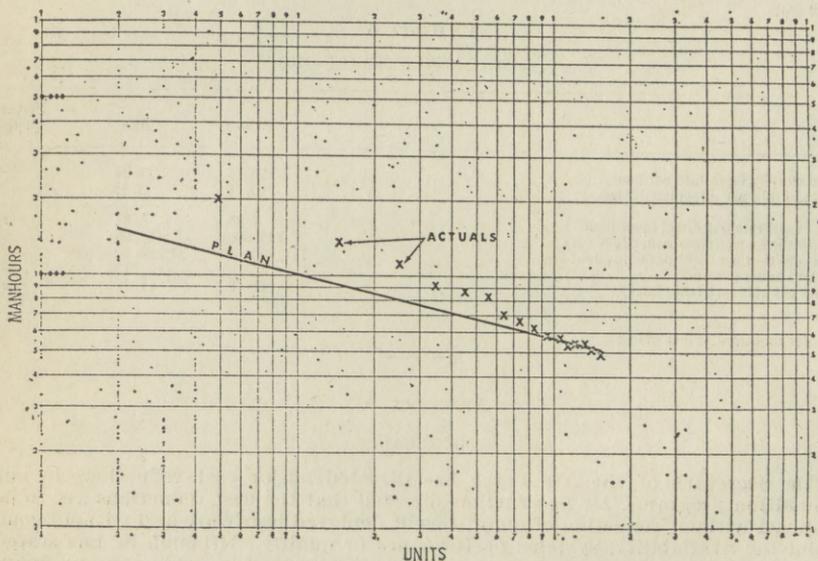


CHART A

Chart A depicts a typical situation encountered in examining factory hours. In this instance, manhours per unit were projected in accordance with a classical "learning curve." This curve, which is a straight line when plotted on logarithmic graph paper, is labeled "PLAN" on Chart A. Typically, the learning curve is developed initially using past experience on the same or analogous programs as the bases for estimating both the starting point and the slope of the curve.

Having projected the plan, the contractor plotted his actual cost in manhours as shown on the chart. This is the sort of information which is typically available to negotiators for projecting follow-on contract manhours.

**MISSILE LAUNCH FACILITIES  
MANHOURLY EXPENDITURES, BY UNIT  
FAB., MINOR AND MAJOR ASSEMBLY**

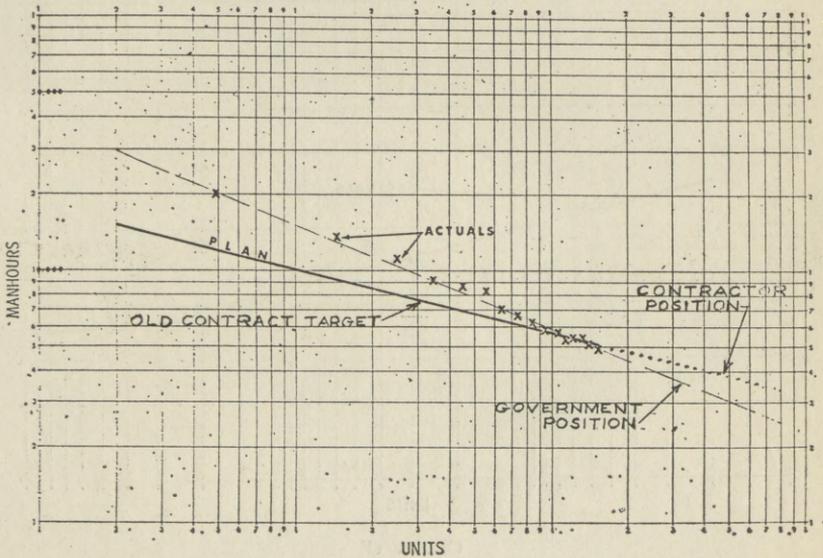


CHART B

Using the information available in our example, the contractor and the government would typically develop separate positions in preparation for negotiation of the follow-on contract. As shown on Chart B, the government negotiators would probably in this instance plot a line of best fit through the plotted points of actual manhours, projecting a steeper or more rapid improvement in manhours per unit than was envisioned in the original plan. Since the steeper projected curve would take off from approximately the end point of the previous plan, the total number of manhours envisioned in the government position would be lower than if the previous plan line were simply extended. The government negotiators would probably contend that the established steep trend was characteristic of the operations involved, and would base their case on the empirical evidence.

On the other hand, the contractor would probably contend that the original plan was a good one all along, and that the steeper curve developed by the government's line of best fit was biased because of peculiar problems early in the program which caused the actuals to exceed the plan. They would point to the fact that even though the early plot points were much above the plan giving rise to the steeper curve, more recent experience supports their position.

MISSILE LAUNCH FACILITIES  
MANHOOUR EXPENDITURES BY UNIT  
FAB.. MINOR AND MAJOR ASSEMBLY

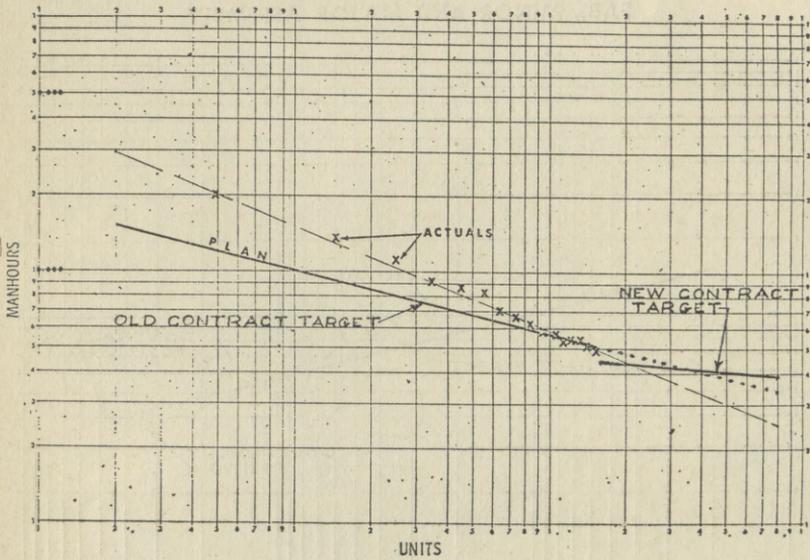


CHART C

After arguing back and forth, the negotiators would probably attempt to settle the issue by compromise. Typically, this compromise is nothing more than a splitting of differences. In our example, the contractor apparently was able to negotiate just about what he wanted in total manhours for the new contract. The government negotiators were allowed to save face by means of the agreement

to set the starting point for the new curve at a lower level. However, since the curve was flatter, the area under the contractor's projections appears to be about the same as that negotiated for the new contract.

In this particular case, the government negotiators, while lacking specific evidence to support their position, believed intuitively that manhours projected by the contractor were excessive. Consequently, they negotiated a type of contract in which the target could be reset in light of subsequent experience. At the same time, the contractor was strongly encouraged, even pressured, to attempt to drive down the actual manhours per unit.

MISSILE LAUNCH FACILITIES  
 MANHOOUR EXPENDITURES BY UNIT  
 FAB., MINOR AND MAJOR ASSEMBLY

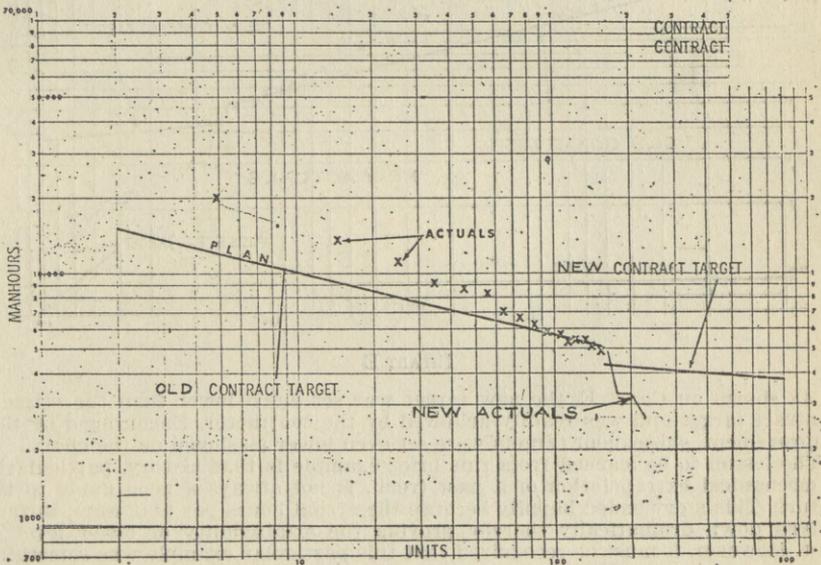


CHART D

The results of the contractor's improvement efforts were immediately apparent as shown by the dramatic and sudden decline in manhours per unit plotted against the new contract target. Based on the actual experience, this new experience set the stage for resetting the contract target.

MISSILE LAUNCH FACILITIES  
 MANHOURLY EXPENDITURES BY UNIT  
 FAB., MINOR AND MAJOR ASSEMBLY

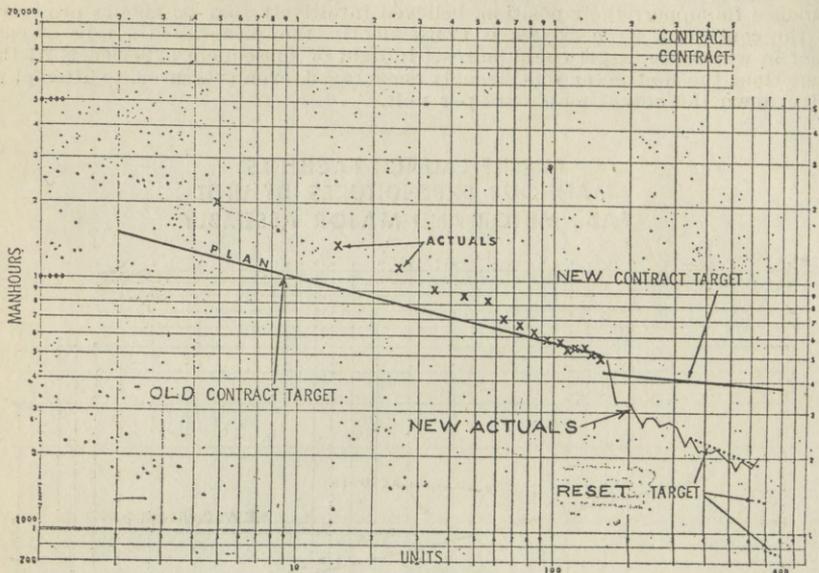


CHART E

As shown on Chart E, the new target was set much lower than the original contract target and was readily achieved by the contractor. Encouraged by this improvement, subsequent targets were set even lower as shown on the chart.

The lesson to be learned from this brief example is that history, particularly a mechanical extrapolation of a past trend, is not always a good guide to the future. This story ended happily because the actual hours per unit were, in fact, driven down dramatically thereby proving the attainability of lower level of cost. However, it must be recognized that this particular example was something of a happy accident. There was literally nothing in the basic data at the time of the follow-on contract negotiations to indicate the existence of the very worthwhile improvement potential. Without detracting from the value of the government negotiators' intuitive judgment, it is unrealistic to expect that this process could be repeated often in the absence of objective measures of manpower requirements.

## PRODUCTION LABOR PERFORMANCE DISPLAY CONTRACTOR "A"

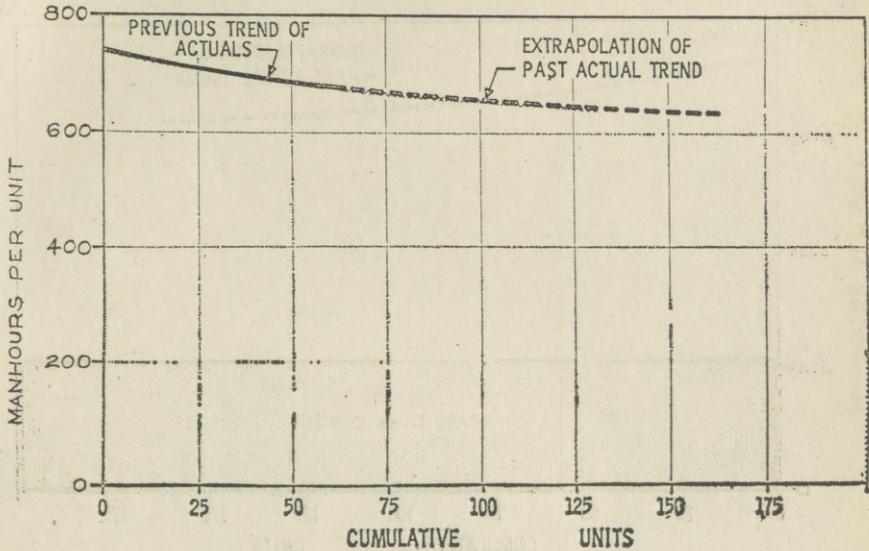


CHART F

Our second case example pictures a situation nearly identical to the first case except that all the dealings were internal to the contractor operations. The negotiations were conducted between the contractor's factory management and his top management control function. As was the case in our first example, the factory management presented a trend of past actuals and proposed extrapolating this trend to develop manhour targets for units of hardware to be produced in the future. To carry the parallel further, there was considerable doubt on the part of the contractor's top management people that the past actual hours per unit represented efficient performance. It was contended that the primary reason for the high level of manhours per unit was that they were planned that way, and that the future projections were "fat."

This contractor's top management control organization recognized that the future projections were something of a self-fulfilling prophecy, particularly if they were fat. If the staffing levels were developed from the target manhours per unit and the schedule was met, it would follow that the actual hours per unit experience would closely approximate the projections.

Accordingly, the top management control organization set out to systematically determine the needed manhours per unit as the basis for projecting a new target.

## PRODUCTION LABOR PERFORMANCE DISPLAY CONTRACTOR "A"

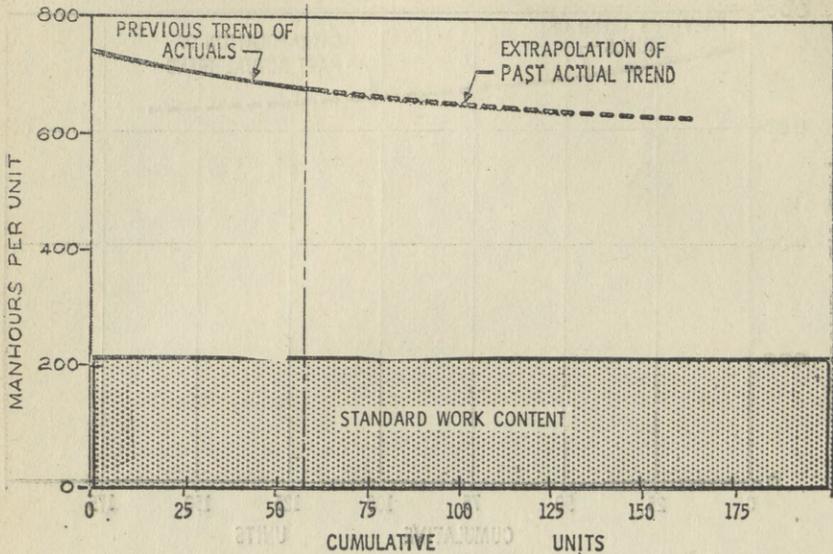


CHART G

The first step in building the "bottoms up" manhour requirements was to determine the standard work content of the manufactured article. The total standard work content was arrived at by adding up the "engineered" standard times for the manufacturing operations involved. This total constitutes the industrial engineers' expectation of time which should be required by qualified personnel to accomplish the work necessary to manufacture the article in question.

As Chart G shows, this level was far below the trend of past actuals, and the proposed target for future work. However, factory management contended that (1) the standard hour target could not be attained because the standards were improperly established, and (2) insufficient allowance had been made for the high incidence of rework and engineering change incorporation.

The industrial engineers' first chore was to prove that qualified personnel could indeed equal or exceed the manhour targets for standard work while working on standard work. This was accomplished in this instance by time studies on the factory floor which demonstrated that workers, while being studied, produced in excess of expectations. The factory workers "underran" the time standards while they were being studied, whereas they customarily "overran" them by large margins.

## PRODUCTION LABOR PERFORMANCE DISPLAY CONTRACTOR "A"

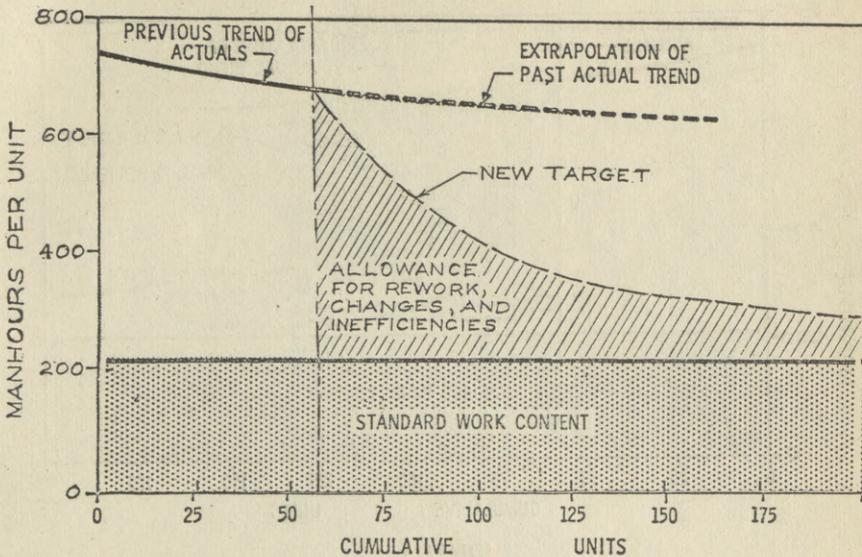


CHART H

After the validity of the standard work content figures had been established, the contractor's top management control function recognized the validity of factory management's arguments regarding the high incidence of rework and engineering changes. In addition, they recognized that some time would be required to change the work habits of factory personnel sufficiently to reduce inefficiencies to an acceptable level. Based on a combination of experience factors for rework, detailed analyses of upcoming changes and estimates of attainable efficiency improvement, a new target was developed which projected manhours per unit much lower than the extrapolation of the trend of past actual hours. The new target of manhours per unit then became the basis for a new schedule and staffing plan aimed at achieving a balance between necessary workload and people assigned.

As noted earlier, the factory employees had "underrun" the time standards while being studied. In order to take advantage of this phenomenon, a supervisor's assignment and follow-up system was designed which focused attention on individual and crew performance. In effect, this system was an on-going substitute for the industrial engineers with watches and clip boards whose presence had typically stimulated performance.

In addition, new time keeping codes were established to pinpoint hours spent on changes and rework and to record labor efficiency losses. Finally, control reports were established to measure organizational performance on a shift by shift and a weekly basis.

# PRODUCTION LABOR PERFORMANCE DISPLAY CONTRACTOR "A"

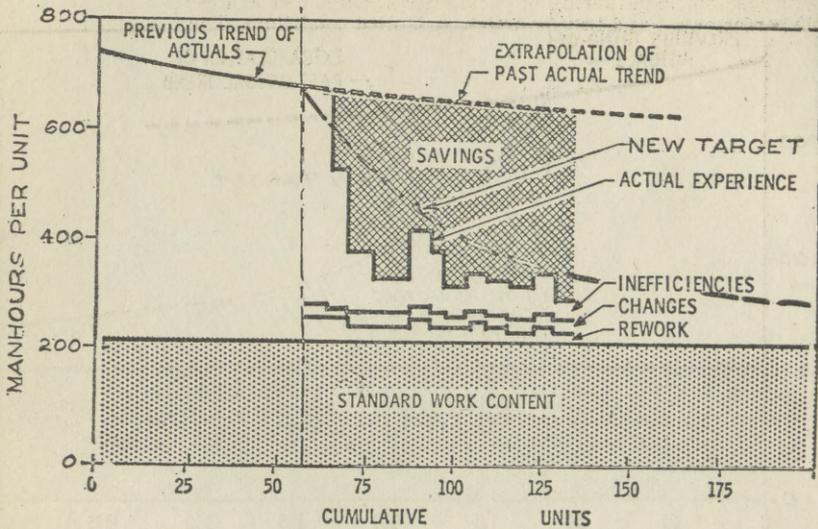


CHART I

The results of balancing the work force to the measured workload were dramatic. As in the case of our first example, manhours per unit declined immediately and steeply. The new target proved to be a readily attainable goal, and the very significant savings depicted on Chart I were captured. In addition, outgoing quality was improved, and a six-week behind-schedule condition was erased concurrently with the cost reduction.

## RESULTS OF COORDINATED IMPROVEMENT PROGRAMS\*

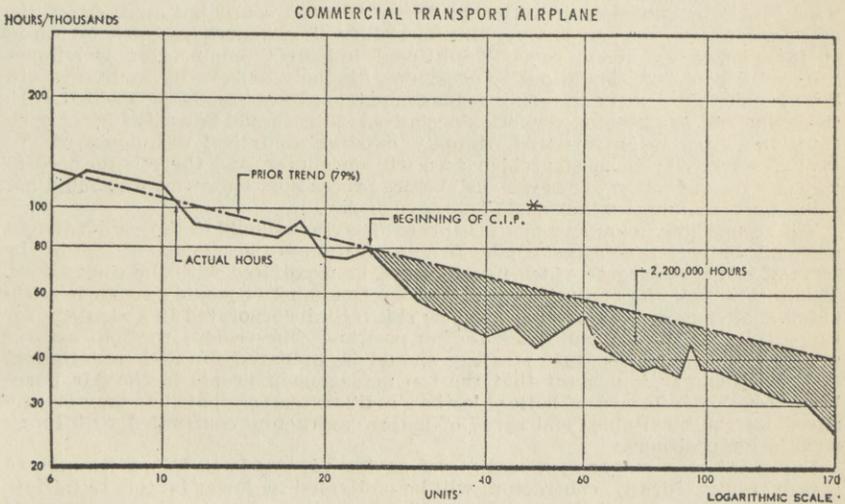
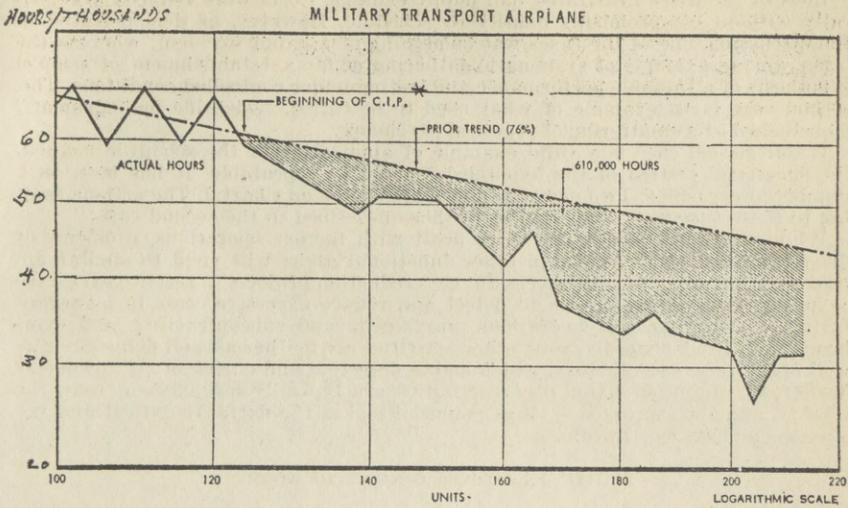


CHART J

\*"Coordinated Improvement Program" (C.I.P.) was the name of the program which marked the shift away from the more traditional mode of management.

## SUMMARY AND ANALYSIS OF CASES

Both of the cases illustrated had happy endings. Costs were reduced dramatically without compromising quality or schedule. However, as demonstrated in the discussion, one of the cases was something of a happy accident, whereas the other was an example of systematic gathering of facts, establishment of a novel hypothesis of attainable performance and testing under controlled conditions. The second case is an example of what used to be called, "scientific management," embellished by a smattering of practical psychology.

If our second case is a valid example of application of the scientific method, the successful testing of the hypothesis should be repeatable. It has been on a number of occasions. Two more examples are shown on Chart J. The actions leading to these successes were similar to those described in the second case.

While examples used so far have dealt with factory operations, problems of detecting labor inefficiencies in other functional areas will yield to similar approaches. Some of the most successful cost reduction projects in recent years have included simultaneous efforts to detect and reduce excessive costs in manufacturing, engineering, test operations, purchasing and subcontracting, and overhead activities. Unhappily, most other activities are neither as well defined nor as well organized as the factory, which makes detection and curing of cost problems harder. On the other hand, other activities are typically less efficient than the factory, and the increased savings potential makes the extra analytical and improvement effort worthwhile.

## PUTTING IMPROVED COSTING TO WORK

As discussed previously, successful reduction of costs of producing military systems can be achieved systematically. First, we need searching analyses of the activities whose costs we are seeking to reduce. These analyses must be aimed at pinpointing avoidable costs. Traditional industrial engineering techniques are useful here, but should not be considered the only tools in the analytical kit. Sound financial and engineering management analyses should be melded with the industrial engineering reviews. Specialized skills should be available for each functional area to be reviewed. Happily, existing analytical techniques can be applied effectively to most problems we will encounter, and there is no need to wait for the invention of "new tools" before proceeding. However, we should not reject new techniques which could help save money.

The second step in our systematic capture of savings should be the establishment of tough but attainable cost goals. In most instances these goals will be in the form of contract targets which usually must be negotiated with the contractors. This means that the analytical work of Step One must be sound enough to withstand challenge and the results must be skillfully incorporated in a strategy for supporting the government's negotiation position. Since each situation involves unique problems, a separate strategy should be prepared for each negotiation. It is particularly important that the top management people in the Air Force be thoroughly informed of both objectives and strategy so that they may be prepared for the inevitable "end runs" of major contractors confronted with tough negotiation positions.

The third step in our systematic cost saving process is to follow through to insure results. Ideally, contractors will be motivated by lower targets to initiate corrective actions on their own. In reality, however, we know that contractual incentives alone are not always sufficient motivations for the difficult actions needed to actually reduce costs. Many large contractors believe they will be let off

the contractual hook one way or another, and that it is therefore unnecessary to expend major efforts to achieve tough cost goals. We can begin to counter this belief by holding contractors to their commitments. Further, we should watch contractor performance to make sure actions are being taken which offer reasonable prospects of achieving lower costs. In this regard, we should recognize that some contractor managements have limited experience in conducting successful cost reduction and control programs. If a contractor with demanding cost reduction goals is not taking effective corrective actions, Air Force top management should be notified at once, so that the contractor may be stimulated before it is too late.

The concepts and approaches we have discussed are applicable to military system acquisitions at any stage of their life cycle. The earlier we act, the more we can save. At the same time, the more mature programs are easier to analyze, and one of our practical limitations is the small number of skilled and experienced people available to do the necessary work. Accordingly, we should concentrate our efforts at those points where potential pay off is greatest. Clearly, the best point in the weapon systems life cycle for influencing future cost control actions is at the time of contractor selection. Improvements initiated or stimulated at this point can pay off throughout the program. Furthermore, chances of success are much greater if negotiations of tough cost goals are conducted with more than one contractor, and initial selection is often the last opportunity to do this.

After initial selection, any significant contractual action with cost implications offers an opportunity to apply stringent, improved costing. These actions would include not only negotiation of follow-on development and production contracts, but procurement of spares and contract changes as well.

Because of the scarcity of skilled analysts and our need to move quickly and economically, cost analysis teams should be kept small. As mentioned previously, we should provide analytical skills for each functional area to be reviewed. Except in those instances where one man may be expert in more than one area, this means we will need as a minimum an industrial engineer, a cost accountant and an engineering management specialist in most cases. In addition, each team should have a full-time leader. If he is skillful, the leader can maximize return on the analytical work by directing concentration on areas most likely to produce savings. Often it is desirable to shift emphasis during the course of a review when new opportunities are presented or old avenues are blocked. A preliminary review of areas of savings potential, a "gold in the mine" study, will usually pay off handsomely. As in the analogous goldmining operation, there is no need to dig up the whole county to get a few nuggets if you know where the mother lode is.

After cost goals representing efficient operations are established, the analyses should be kept up to date, particularly in the plants of contractors where we have resident representatives and with whom we expect to do business in the future. Properly maintained, the analyses can be made useful for many contractual actions without the necessity for starting from scratch each time. This is especially applicable to overhead analyses. One good analysis of a contractor's overhead pools can be used with a minimum of modification and maintenance on large numbers of negotiations. Once an overhead pool is analyzed, there is nothing unique about the portions allocated to new contracts, contract changes or spares transaction.

Finally, the most important step in putting improved costing to work is to get started. Experience is the best teacher, and we can only get experience in systematic cost saving projects by working at them. An immediate start is necessary if we are to achieve the difficult goals which have been set for us.

DD Form 633: Contract Pricing Proposal

DEPARTMENT OF DEFENSE CONTRACT PRICING PROPOSAL		Form Approved Budget Bureau No. 22-R100	
This form is for use when submission of cost or pricing data (see ASPR 3-807.3) is required		PAGE NO.	NO. OF PAGES
NAME OF OFFEROR		SUPPLIES AND/OR SERVICES TO BE FURNISHED	
HOME OFFICE ADDRESS (Include ZIP Code)		QUANTITY	TOTAL AMOUNT OF PROPOSAL
DIVISION(S) AND LOCATION(S) WHERE WORK IS TO BE PERFORMED			\$
			GOVERNMENT SOLICITATION NO.
COST ELEMENTS		PROPOSED CONTRACT ESTIMATE	
		TOTAL COST <sup>1</sup>	UNIT COST <sup>2</sup>
			REFERENCE <sup>3</sup>
1. DIRECT MATERIAL <sup>4</sup> COSTS	A. PURCHASED PARTS <sup>5</sup>		
	B. SUBCONTRACTED ITEMS <sup>6</sup>		
	(1) RAW MATERIAL <sup>7</sup> (2) STANDARD COMMERCIAL ITEMS <sup>8</sup> (3) INTERDIVISIONAL TRANSFERS (at other than cost) <sup>9</sup>		
	2. MATERIAL OVERHEAD <sup>10</sup>		
	3. INTERDIVISIONAL TRANSFERS AT COST <sup>11</sup>		
	4. DIRECT ENGINEERING LABOR <sup>12</sup>		
	5. ENGINEERING OVERHEAD <sup>13</sup>		
	6. DIRECT MANUFACTURING LABOR <sup>14</sup>		
	7. MANUFACTURING OVERHEAD <sup>15</sup>		
	8. OTHER COSTS <sup>16</sup>		
	9. SUBTOTALS		
	10. GENERAL AND ADMINISTRATIVE EXPENSES <sup>17</sup>		
	11. ROYALTIES <sup>18</sup>		
	12. FEDERAL EXCISE TAX <sup>19</sup>		
	13. SUBTOTALS		
	14. PROFIT OR FEE		
	15. TOTAL PRICE (Amount)		
1. HAVE THE DEPARTMENT OF DEFENSE, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, OR THE ATOMIC ENERGY COMMISSION PERFORMED ANY REVIEW OF YOUR ACCOUNTS OR RECORDS IN CONNECTION WITH ANY OTHER GOVERNMENT PRIME CONTRACT OR SUBCONTRACT WITHIN THE PAST TWELVE MONTHS?			
<input type="checkbox"/> YES <input type="checkbox"/> NO    IF YES, IDENTIFY BELOW.			
NAME AND ADDRESS OF REVIEWING OFFICE (Include ZIP Code)		TELEPHONE NUMBER	
II. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS PROPOSED CONTRACT?			
<input type="checkbox"/> YES <input type="checkbox"/> NO    IF YES, IDENTIFY ON A SEPARATE PAGE.			
III. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT?			
<input type="checkbox"/> YES <input type="checkbox"/> NO    IF YES, IDENTIFY: <input type="checkbox"/> ADVANCE PAYMENTS <input type="checkbox"/> PROGRESS PAYMENTS OR <input type="checkbox"/> GUARANTEED LOAN			
IV. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR SIMILAR ITEMS WITHIN THE PAST THREE YEARS?			
<input type="checkbox"/> YES <input type="checkbox"/> NO    IF YES, SHOW CUSTOMER(S) AND CONTRACT NUMBERS BELOW OR ON A SEPARATE PAGE.			
V. DOES THIS COST SUMMARY CONFORM WITH THE COST PRINCIPLES SET FORTH IN ASPR, SECTION XV (see 3-807.3(c)(2))?			
<input type="checkbox"/> YES <input type="checkbox"/> NO    IF NO, EXPLAIN ON A SEPARATE PAGE			
This proposal is submitted for use in connection with and in response to _____			
_____ * and reflects our best estimates as of this date.			
in accordance with the instructions to offerors and the footnotes which follow:			
*DESCRIBE RFP, ETC.			
TYPED NAME AND TITLE		SIGNATURE	
NAME OF FIRM		DATE OF SUBMISSION	

14 February 1969

ASPM No. 1

*DD Form 633: Contract Pricing Proposal—Continued*

## INSTRUCTIONS TO OFFEROR

1. The purpose of this form is to provide a standard format by which the offeror submits to the Government a summary of incurred and estimated costs (and attached supporting information) suitable for detailed review and analysis. Prior to the award of a contract resulting from this proposal, the offeror shall, under the conditions stated in ASPR 3-807.3, be required to submit a Certificate of Current Cost or Pricing Data (see ASPR 3-807.3(e) and 3-807.4).

2. As part of the specific information required by this form, the offeror must submit with this form, and clearly identify as such, cost or pricing data (that is, data which is verifiable and factual and otherwise as defined in ASPR 3-807.3(e)). In addition, he must submit with this form any information reasonably required to explain the offeror's estimating process, including:

- a. The judgmental factors applied and the mathematical or other methods used in the estimate including those used in projecting from known data, and
- b. The contingencies used by the offeror in his proposed price.

3. When attachment of supporting cost or pricing data to this form is impracticable, the data will be specifically identified and described (with schedules as appropriate), and made available to the contracting officer or his representative upon request.

4. The formats for the "Cost Elements" and the "Proposed Contract Estimate" are not intended as rigid requirements. These may be presented in different format with the prior approval of the contracting officer if required for more effective and efficient presentation. In all other respects this form will be completed and submitted without change.

5. By submission of this proposals offeror, if selected for negotiation, grants to the contracting officer, or his authorized representative, the right to examine, for the purpose of verifying the cost or pricing data submitted, those books, records, documents and other supporting data which will permit adequate evaluation of such cost or pricing data, along with the computation and projections used therein. This right may be exercised in connection with any negotiations prior to contract award.

## FOOTNOTES

NOTE 1. Enter in this column those necessary and reasonable costs which in the judgment of the offeror will properly be incurred in the efficient performance of the contract. When any of the costs in this column have already been incurred (e.g., on a letter contract or change order), describe them on an attached supporting schedule. When "preproduction" or "startup" costs are significant or when specifically requested in detail by the contracting officer, provide a full identification and explanation of same.

NOTE 2. The use of this column is optional for multiple line item proposals, except where the contracting officer determines that a separate DD Form 633 is required for selected line items.

NOTE 3. Attach separate pages as necessary and identify in this column the attachment in which the information supporting the specific cost element may be found. No standard format is prescribed; however, the cost or pricing data must be accurate, complete and current, and the judgment factors used in projecting from the data to the estimates must be stated in sufficient detail to enable the contracting officer to evaluate the proposal. For example, provide the basis used for pricing the bill of materials such as by vendor quotations, shop estimates, or invoice prices; the reason for use of overhead rates which depart significantly from experienced rates (reduced volume, a planned major rearrangement, etc.); or justification for an increase in labor rates (anticipated wage and salary increases, etc.). Identify and explain any contingencies which are included in the proposed price, such as anticipated cost of rejects and defective work, anticipated costs of engineering redesign and retesting, or anticipated technical difficulties in designing high-risk components.

NOTE 4. Provide a list of principal items within each category of material indicating known or anticipated source, quantity, unit price, competition obtained, and basis of establishing source and reasonableness of cost.

NOTE 5. Include material for the proposed contract other than material described in the other footnotes under the cost element entitled "Direct Material."

NOTE 6. Include parts, components, assemblies, and services to be produced or performed by other than you in accordance with your designs, specifications, or directions and applicable only to the prime contract.

NOTE 7. Include raw and processed material for the proposed contract in a form or state which requires further processing.

NOTE 8. Include standard commercial items normally fabricated in whole or in part by you which are generally stocked in inventory. Provide explanation for inclusion at other than the lower of cost or current market price.

NOTE 9. Include all materials sold or transferred between your plants, divisions or organizations under a common control at other than cost to the original transferor and provide explanation of pricing method used.

NOTE 10. Indicate the rates used and provide an appropriate explanation. Where agreement has been reached with Government representatives on the use of forward pricing rates, describe the nature of the agreement. Provide the method of computation and application of your overhead expense, including cost breakdown and showing trends and budgetary data as necessary to provide a basis for evaluation of the reasonableness of proposed rates.

NOTE 11. Include separate breakdown of costs.

NOTE 12. Provide a separate breakdown of labor by appropriate category and furnish basis for cost estimates.

NOTE 13. Include all other estimated costs (e.g., special tooling, facilities, special test equipment, special plant rearrangement, preservation packaging and packing, spoilage and rework, and warranty) which are not otherwise included. Identify separately each category of cost and provide supporting details. If the proposal is based on a F.O.B. destination price, indicate separately all outbound transportation costs included in total amount.

NOTE 14. If the total cost entered here is in excess of \$250, provide on a separate page (or on DD Form 733, *Royalty Report*) the following information on each separate item of royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description, including any part or model numbers of each contract item or component on which the royalty is payable; percentage or dollar rate of royalty per unit; unit price of contract item; number of units; and total dollar amount of royalties. In addition, if specifically requested by the contracting officer, a copy of the current license agreement and identification of applicable claims of specific patents shall be provided.

NOTE 15. Selling price must include any applicable Federal excise tax on finished articles.

## PREPARED STATEMENT OF A. E. FITZGERALD

Mr. Chairman, in my statement today I wish to comment on two particularly significant studies which this Subcommittee has recently received and then to add some observations of my own.

The first of the studies I have referred to is Mr. Yuspeh's excellent paper, "The General Advantages of Competitive Procurement Over Sole Source Negotiation in the Defense Department." I think this study is one of the most revealing and potentially useful papers ever presented to the Subcommittee.

The facts in Mr. Yuspeh's study demonstrate conclusively that there is enormous potential for cost reduction in military procurement. Hopefully, a majority of the Congress and proponents of good stewardship in the Administration will concentrate on ways of capturing the savings potential and will not be deterred by obstacles, genuine or contrived, to wider use of competition.

To begin with, we should recognize that there are real problems in successfully competing complex acquisitions. Not the least of these is the problem of communicating requirements to several competitors clearly and in legally enforceable terms. For production contracts, this entails assembly of comprehensive bid packages of drawings and specifications. It would be reasonable to expect that workable bid packages would be routinely produced by design departments of the big contractors since the information necessary to a good bid package is exactly the same as that needed to communicate requirements to a designer's own factory. Unfortunately, design documentation is often grossly deficient due to lack of discipline in contractors' design departments, and factory work is often accomplished to the accompaniment of extensive arm waving on the part of engineers and frequent use of colored pencils to change drawings on the factory floor.

Ideally, responsibility for producing a usable bid package should be the responsibility of the designing contractor, who would guarantee both the completeness of the package and the acceptability of products built to the specifications. However, given the typically lax enforcement of contracts with large firms, I believe that Government representatives must play a role in this process. Practically speaking, we need a revitalization of the old-fashioned design check function in Government plant representatives' offices. Essentially this means that Government designers must examine drawings and specifications for form, fit and function and for realism in requirements laid on the factory. Then the factory and test work must be monitored to make sure that products are actually built to the specifications and that equipment so built actually performs as required.

If Mr. Yuspeh's study could be extended to cover the adequacy of the bid packages, I believe there would be a direct correlation between high quality bid packages and success in obtaining lower responsible bids. When my former associates and I worked on the development contract and the first contract buy of the Standard Missile, Type 1, we found the Navy's engineering office at the contractor's plant to be especially strong in design check and inspection. I believe the work of the Engineering Officer in this case, Lt. Cdr. Will Klemm, contributed significantly to the subsequent successful competition.

The trend in recent years has been away from the specific, factual quantitative monitoring we saw in Cdr. Klemm's operation at General Dynamics/Pomona. Instead, we have seen a general tendency to rely more on qualitative reviews of contractors' own systems as a substitute for specific factual monitoring. As might be expected, the existence of seemingly valid contractor procedures in no way guarantees that the procedures will be followed in practice.

None of my comments on the desirability of good bid packages should be interpreted as endorsement of mandatory freezing of designs by winning competitors. One of the consistently successful low-bidders in the sample selected by Mr. Yuspeh is a firm I know very well from my former consulting practice. In comparison to most other aerospace firms, this company is quite strong in cost management, and puts considerable emphasis on both labor efficiency and designing for ease of production. I have been told informally that this firm was able to achieve lower costs in large part through redesign for simplified production.

Another practical obstacle to wider competition is sheer size of some of the complex military equipment and the tooling necessary to build it. Some of the specialized tooling, especially assembly jigs for large aircraft, is truly monumental.

Fortunately, there is often a way around this obstacle, too. Many of our large military planes are assembled in Government-owned plants. I believe it would

be entirely practical to hold competitions for the tenancy, maintenance and management of production in these plants, even in the midst of a production run. A classic example of a lost opportunity of this sort was the case of Lockheed's production of the C5A transport. The C5A was assembled in Air Force Plant No. 6 in Marietta, Georgia. Several people now present in this room proposed allowing different management groups to compete for the management of the Air Force Plant No. 6 at the time Lockheed was threatening to default on their C5A contract if they did not get their way in renegotiating their contracts. The proposal was shouted down in the emotional climate of the time.

However, in testimony quoted in the July 2, 1971 staff study of Lockheed by the House Banking and Currency Committee, Mr. David Packard, then Deputy Secretary of Defense, stated:

"I frankly would have no trouble in having somebody go down and run that plant (i.e., Air Force Plant No. 6 in Marietta, Georgia) independently of the rest of the company."

From the taxpayers' viewpoint, the tragic aspect of Mr. Packard's assessment of the practicality of changing management in mid-stream was that he had already approved a bailout—a grant, in effect—of about four times Lockheed's net worth as an alternative solution.

I must concede that I believe that such a change of management would pose considerable but not fatal difficulties. In particular, I think the Government should make sure that a new management tenant would have the use of records, procedures and process instructions necessary to the uninterrupted operation of the plant. In addition, there is the problem of assuring that the new management agreement fully protects rights of employees in such matters as retirement benefits.

Despite the troublesome nature of changing management tenants, none of the problems seem insurmountable, and the stimulus of broader competition would be well worth the somewhat routine difficulties.

The Army has changed contractor managements in its GOCO (Government Owned Contractor Operated) plants from time to time, and a study of these changeovers should do much to reduce legitimate fears of the unknown in this potentially fruitful approach.

Moving to a point of mild disagreement with the fine competition study, I now wish to comment on the discussion of so-called learning curves. Learning curves, or more appropriately, progress curves, are useful in tracking changes in cost levels, especially with respect to factory labor hours. However, progress curves do *not* specifically "tell managers how efficient their operations are". Neither the starting point nor the slope of the improvement curve has any necessary relationship to true efficiency. Improvement curve experts often assume that a curve with a steep downward slope, one depicting a rapid rate of improvement, reflects an "efficient" operation. It is obvious, however, that a rapid rate of improvement could be facilitated simply by *planning* an extremely fat and inefficient operation in the beginning, then making relatively easy staffing, schedule and work content changes to achieve the steep slope, thereby "proving" the validity of the improvement curve as an immutable guide to human behavior. On the other hand, the same work could be planned and budgeted to start at a low cost level, and subsequent improvement would come much harder. The downward slope of the improvement curve would then probably be less steep, and some improvement curve purists would thereby pronounce the more tightly controlled operation less efficient than the fat operation displaying rapid improvement.

Best use of improvement curves requires that they be looked at in combination with objective, systematic measurement of the work content of the manufactured articles. The second study I alluded to at the beginning of my statement contains information of the sort needed to supplement improvement curves.

This second study, which was recently obtained by the Subcommittee from the Department of the Army. The study, entitled "Review of the U.S. Army Material Command Should Cost Study," was completed on May 5, 1972. It was prepared by a contractor, Performance Technology Corporation.

The long and somewhat esoteric study was heavily censored by the Army prior to transmittal to the Subcommittee. In my opinion, the censorship was entirely unwarranted, and the Army should provide the complete, uncensored study which I suggest be included in the record of this hearing. I believe the study is important both because of the information it contains and because it is unlikely that similar information will be available again in the foreseeable future.

The key to understanding the message in the study of AMC should-cost activi-

ties is the concept of measuring the work content of manufactured articles. Let me explain briefly how the units for measuring work are developed. First, through a combination of time study, predetermined time data and other measurement techniques, the time which should be required by a competent worker using specified equipment to perform described work can be developed. This is called *normal time*, and vast files of such data have been accumulated for industrial operations since 1886, when systematic work measurement caught hold in this country. More recently, similar bodies of data have been developed for clerical work and some technical activities. The normal time for a given task or unit of product covers only pure work time, and is therefore not a good basis for measuring output on a going basis. No one, not even factory workers, can work all the time, so allowances have to be added to the normal time to provide for personal time, job-induced fatigue, unavoidable delays and the like. As in the case of normal time data, information on allowances, especially for personal and fatigue, has been highly developed over a long period of time. The sum of the normal time for a job and all allowances is the "reasonable expectancy" of time which should be expended in doing the job, and is called *standard time*. The reasonable expectancy for the amount of work which should be done in a chronological hour is called a *standard hour* of work. It should be emphasized that the standard hour is a measure of work *output* and has no necessary relationship to time actually expended in doing the job.

Managers of cost competitive business try to get as many standard hours of output as possible for labor hours actually expended. Unfortunately, managers of most large military contractor operations do not have similar objectives or sufficient motivation to do the hard things necessary to achieve high efficiency.

Although very few of our big military contractors make effective use of work measurement in cost control, most maintain elaborate work measurement and time standards departments out of atavistic habit. It is the accepted thing to do, even though the time standards function may be no more than a part of the "management image" facade. Nevertheless, time standards for most military hardware do exist and are subject to audit, verification, and adjustment if necessary.

Time standards, then, can provide a useful basis for measuring efficiency and thereby identifying excessive cost, or fat, in contractor operations. Properly established, time standards can provide valid bases not only for measuring labor efficiency and savings potential in a contractual context, but also for meaningful comparisons between contracts and between military contracts and commercial operations. If the work content is properly measured, time standards can serve as a kind of common measuring stick or common denominator making possible meaningful comparative evaluations of efficiency of producing dissimilar products or production under differing circumstances. Use of this tool can give highly reliable information on comparative efficiency levels of, say, the Mark 48 Torpedo, Mod. I and the Mark 48, Mod. II. We could compare, with a sort of rough justice, Lockheed's labor efficiency in producing the C5A with the efficiency of McDonnell-Douglas' F-4 work. We can even draw meaningful inferences about relative efficiencies of producing military radars and commercial television receivers.

Due to an apparent oversight by the Army's censor, some comparative data on overall costs of manufacturing survived the intended emasculation of the report sent to the Subcommittee. The following table, complete with contractor names deleted elsewhere, appears on pages 67 and 68 of the study :

Contractor	Industry	Amount per standard labor hour <sup>1</sup> index (Government position)
Continental.....	Automotive.....	\$19.52
Bell Helicopter.....	Airframe.....	22.03
Hughes.....	Missile.....	24.47
Chrysler.....	do.....	37.33
Raytheon.....	do. <sup>2</sup> .....	46.54
Do.....	do. <sup>3</sup> .....	50.21
Hoffman.....	Electronics.....	97.70
Sanders.....	do.....	195.33

<sup>1</sup> Standard labor hour equals standard hour.

<sup>2</sup> GSE.

<sup>3</sup> Missile.

The denominator of the \$/Standard Labor Hour index was developed by including only the standard time for basic factory conversion labor (fabrication and assembly) for work done in-house by each contractor. This approach aims at isolating measurement of pure output, and should minimize distortions arising from variations in amount of support labor included by the different contractors in their work measurement coverage. The numerator of the index is derived by deleting from total costs those elements of cost outside the direct control of the prime contractor's internal management, specifically material and subcontract costs. The index, then, provides total in-house dollars of costs for the production of a standard unit of output.

The report qualifies the validity of the index by stating that the figures are not completely accurate because of different methods of standards construction. The degree of distortion is not estimated, but should be minimal if the validity of the standards was properly tested in the course of fact finding. I would add a further qualification. As an aid to accounting for the vast differences in apparent efficiency levels, the weapon system information which the Chairman of this Subcommittee requested of the Comptroller General on December 2, 1971 should be obtained. The Comptroller General subsequently requested the information from the Secretary of Defense in a letter dated February 22, 1972. (Attachment 1 is a copy of this letter.) So far as I know, the requested information has never been received from the Comptroller General.

Having given the technical background and stated qualifications as to reliability of the data, let me now move to an interpretation of the meaning of cost levels shown in the \$/SLH index. Figures in the table range from \$19.52/SLH to \$195.33/SLH. These represent the *Government's negotiation objectives*. We don't know what was negotiated nor what levels of cost were actually achieved by the contractors. By way of comparison, I estimate that most competitive commercial manufacturers of hardware of comparable complexity have cost levels of \$8-10/SLH. The best comparable figure among the \$/SLH indices is more than twice the current commercial level and the worst is about 20 times as high. I estimate that if typical \$400 color television sets were built for \$195.33/SLH, and mark-up percentages were unchanged, a consumer would pay around \$8,000 for his set.

Outlandish as they may seem, I do not believe the \$/SLH figures shown in the report unusual for large weapon systems. Based on my experience, the figures shown for Hoffman and Sanders are only marginally worse than similar figures for other electronics and avionics producers on big programs.

The should-cost approach as originally envisioned by this Subcommittee and those who testified in support of the approach had great potential for cost savings. I believe some savings may have actually been realized on the smaller programs. A particularly interesting application combining should-cost analysis and competitive procurement is described on pages 2 and 3 of the review of AMC should-cost programs:

"Two years ago, the Army was paying \$5,117 for each (censored). Unit prices were rising even in the face of increasing quantities being procured. The Should Cost Study, coupled with the use of competition, dramatically broke the trend of increasing prices. Unit prices dropped from \$5,117 to \$3,670.<sup>1</sup> Subsequent competition dropped the unit price further from \$3,670 to \$2,120. It might be argued that this was solely the result of competition and not the use of should cost. Admittedly, it is impossible to separate the influence of competition. However, it should be noted that (censored) already existed as a second source before the Should Cost Study was performed—and unit prices were rising. In light of this, it would seem improbable that should cost was impotent in positively influencing the taxpayers' interest."

Once again the censor missed a name which provides a clue for this Subcommittee and the taxpayers. The footnote "Hughes procurement" indicates to me that the program in question was the TOW, a wire-guided anti-tank missile which has been produced by Hughes and Chrysler.

On the surface, it may seem strange that the Army should want to hide such an apparent success. Another such example (pp. 3 and 4) is equally curious:

"The (censored) procurements provide another striking example. The (censored) had been built for years—thousands had been produced. The (censored) Company had gained a reputation as a low-cost producer. Based upon our own experience in dozens of defense contractor plants, (censored) repu-

<sup>1</sup> Hughes procurement.

tation was and is deserved. They are most efficient when compared to other contractors within the industry. Prior to the Should Cost Study, the unit price of the (censored) had been steadily declining in learning curve fashion. This would hardly seem the best candidate for a Should Cost Study. Yet even here, Should Cost proved effective. And much of what could not be negotiated on the (censored) went back after and secured during the (censored) negotiation. There was an additional effective drop in unit prices between the (censored) and (censored) buys which is not readily apparent in that the proportion of GFM was higher in the (censored) procurement than in the (censored) procurement. In addition, during the FY 71 negotiation, (censored) was successful in finally breaking up the (censored) pools. While this action may not save much money insofar as the Government as a whole is concerned, nonetheless it should be applauded since the (censored) pools were an abomination that violated the accounting concept of equity of allocated costs."

The should-cost review went on to describe opposition to the program by vested interests in and out of Government, and to forecast the probable demise of the approach as a viable, big-scale cost reducing aid.

Despite some successes, I fear the should-cost approach may have already been emasculated. We know, for example, that the initial savings of the TF-30 jet engine should-cost project have long since been given back to the contractor. We have good reason to believe that the same thing has happened to savings on the Improved Hawk at Raytheon reported earlier by the Army to this Subcommittee. My suspicions are further aroused by the absolute refusal of the Army to furnish any substantive, specific information (except accidentally) on programs they previously bragged about.

We know that intense pressure has been applied by the contractors, some elements of the Department of Defense and the GAO to switch emphasis in the should-cost approach from a quick, incisive, quantitative assessment of savings potential to a drawn-out, vague, qualitative review of contractor operations. Based on GAO's formal reports assessing should-cost projects and on lengthy conversations with GAO and DoD analysts, I believe the emasculating switch of emphasis is all but complete.

Unless these doubts can be laid to rest by facts, I suggest that this Subcommittee consider withdrawing its endorsement and discontinuing its monitoring of the new-look should-cost approach. Qualitative reviews will not produce significant hard savings, and I believe scarce staff time could be better spent in expanding opportunities for savings such as those reported in Mr. Yuspeh's report. At the same time, I believe the Subcommittee should continue its attempts to construct broad indicators of efficiency and productivity. The \$/SLH index in particular is a good aid in judging overall savings potential. Even where competition has sharply reduced prices, indices such as \$/SLH can help detect residual fat. Attachment 2 outlines a simplified method for computing rough and ready \$/SLH indices in case the Subcommittee staff is able to get the necessary data.

In moving to my general comments, I should like to deal with a question which has been asked me many times: Why should the Joint Economic Committee be concerned with military procurement matters? Beyond the usual valid answers relating to general effect of military procurement on our national economy, I believe the JEC should be greatly concerned about the effect of shockingly low efficiency and productivity allowed in operations of big contractors on the productivity of other segments of our industrial economy. Since before the turn of the century, American industry's superior efficiency allowed us to pay ourselves—both management and workers—far more than foreign competitors and still compete successfully in world markets. Despite such cosmetic remedies as devaluation, we are experiencing continuing difficulties in retaining a margin of productive superiority sufficient to offset wage and salary differentials. We see occasional comments on this problem, such as the *Washington Post* editorial of April 30, 1973 (Attachment 3), but there seems to be no sustained attack on the problem by professional economists.

For the better part of my 22 years as an industrial engineer, I have watched with increasing concern as the low efficiency, the poor work habits and bad management allowed in the big-time military contracting have infected the rest of our national industrial body. I am convinced that we will never achieve our full potential for a generally-shared good life for our citizens until this infection is cured. The JEC is uniquely equipped and situated to keep attention focused on this problem, and I hope Committee efforts in this area will continue.

I also believe the JEC is the ideal organization to explode the wide-spread myth that waste makes us rich. It is true that the enormous excess contract costs highlighted in the two reports reviewed here today increases the index known as the gross national product and undeniably "make jobs" in the over-staffed contractor plants. At the same time, it is perfectly clear that no useful goods, services or other additions to national wealth result from the excess costs. Surely our top economists can find ways to reflect the true effects of waste in economic indicators.

Finally, I believe the Joint Economic Committee offers the only viable hope for highlighting the upside-down rewards and punishment system which currently steers the military procurement community.

As for big contractor members of the community, the best qualified observers seem agreed that they have no necessity to excel. Gordon Rule has testified repeatedly on this point, including his May 6, 1969 testimony before the House Government Operations Committee when he said of the favored giants, "No matter how poor the quality, how late the product and how high the cost, they know nothing will happen to them. Until or unless this climate is changed, there will be little or no improvement in our procurements."

Admiral Rickover has expressed similar views, including his April 28, 1971 testimony before this Subcommittee which bears repeating:

"... large defense contractors can let costs come out where they will, and count on getting relief from the Department of Defense through changes and claims, relaxations of procurement regulations and laws, government loans, follow-on sole-source contracts, or other escape mechanisms. Wasteful subcontracting practices, inadequate cost controls, shop loafing, and production errors mean little to these contractors, since they will make their money whether their product is good or bad; whether the price is fair or higher than it should be; whether delivery is on time or late. Such matters are inconsequential to the management of most large defense contractors, since, as with other regulated industries, they are able to conceal the real facts concerning their management ineptitude from the public and from their stockholders, until they stumble finally into the arms of government for their salvation."

The big contractors are complacent and secure in their indolence. Not so the high-ranking government members of the community. These people generally react like criminal suspects in covering up their activities. They put down aggressive would-be cost reducers and investigators with a vengeance. Continued concealment of information of the sort contained in the two reports reviewed here today is, I believe, a major motive for the unrelenting suppression of economy advocates, especially those who support full disclosure of unclassified facts.

Prospects for proponents of truly significant reductions in military acquisition costs within the military procurement community have never been more bleak. Indeed, practically all of the competent tightwads I have worked with in the past have already been driven from the business or neutralized. Some have been effectively outlawed from responsible industrial employment.

My travels and extensive contracts with people all over the country in the last four years have convinced me that most of our citizens want economy in government and they are unhappy that they are not getting it. This unhappiness is increasingly directed toward the highly suspect stewardship of our enormous military budget. Someday soon, if representative Government survive, the present unhealthy climate will change, and our rewards and punishment system will be set right. The responsible studies, analyses and educational work of this Subcommittee is the best hope for speeding this happy day. Please keep at it.

#### ATTACHMENT 1

COMPTROLLER GENERAL OF THE UNITED STATES,  
*Washington, D.C., February 22, 1972.*

B-159896.

The Honorable the SECRETARY OF DEFENSE.

DEAR MR. SECRETARY: On several recent occasions Senator Proxmire, Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee, has requested and been denied copies of the should-cost studies performed by the military services.

By letter of October 5, 1971, to the Assistant Secretary of Defense (I&L), Senator Proxmire requested detailed cost data from the should-cost studies and negotiation records. The Assistant Secretary in a reply of October 28, 1971, ex-

plained why the requested data could not be furnished and suggested that the General Accounting Office be asked to review and assess the DOD should-cost studies made to date.

Subsequently we received a request from Senator Proxmire to review and assess the DOD should-cost studies and currently have underway a review of three studies performed by the Army. This effort will be followed by reviews of Navy and Air Force studies.

Senator Proxmire also has requested that we obtain detailed information for selected weapon systems or subsystems which were the subject of should-cost studies. The information requested is the same as that set forth in Senator Proxmire's October 5, 1971, letter to the Assistant Secretary, as follows:

1. Prime direct labor in man-hours and dollars. This is the portion of direct labor dedicated to actually producing engineering designs, manufacturing hardware, and performing tests. The hours and dollars should be shown separately by major function—engineering, manufacturing, and test operations as a minimum.
2. All other direct labor in man-hours and dollars.
3. Other direct charges (specify).
4. Productive material, that is, material actually incorporated in the product.
5. All other material.
6. Indirect costs by pool, including general and administrative pools.
7. Quantities of test articles.
8. Quantities of production articles.
9. Subcontract costs.
10. Peculiar charges (specify).
11. Profit or foe.
12. Total contract price.

For major subcontracts, the same breakdown (items 1-12) as for prime and associated contractors should be furnished.

Direct man-hours should be spread along a progress curve for manufacturing activities. In addition, furnish the industrial engineering standard hour content per unit of hardware, along with the Government's analysis of the validity of the contractors' time standards.

The foregoing breakdown of data should be furnished for each contractor price proposal, for each fact-finding study, for each negotiated price, and for actual costs and prices paid.

This request for data has been the subject of several discussions between our office and representatives of the Office of the Assistant Secretary of Defense (I&L). As a result of our latest meeting, agreement was reached on the data that could be furnished which includes only a portion of the requested data. Therefore, we would like to have all of the above information furnished promptly for the following weapon systems or subsystems in the order listed:

1. TF-30 Jet Engine
2. MK-48 Torpedo
3. MK-12 Re-entry System
4. Improved Hawk Missile
5. UH-1 Helicopter
6. SRAM Missile
7. TOW Missile
8. Safeguard System
9. F-14 Aircraft

In the event you decline to provide any of the above described information, please give us your basis for each item denied.

Sincerely yours,

ELMER B. STAATS,  
*Comptroller General of the United States.*

ATTACHMENT 2

OUTLINE OF SIMPLIFIED COMPUTATION OF \$/SLH PRICE INDEX

Legend:

SLH=Standard Labor Hours  
SLI=Standard Labor Index

To compute the SLI for any factory on a given contract:

1. Obtain make-or-buy structure for the contract, making sure interdivisional purchases are included.

2. Identify items and components of items deliverable under the contract which are made in the main factory of the prime contractor. This should include specified spares, modification kits, etc., as well as major end items such as airplanes, missiles and so on.

3. Aggregate fabrication and assembly SLH for each item identified in Step 2 above. *Exclude* SLH content of testing, inspection, set-up and other non-conversion labor.

4. Multiply SLH for each item by number of items being bought.

5. Add up products of Step 4.

6. Add up actual or estimated dollar figures for raw material, purchased parts and equipment, sub-contracts and interdivisional charges.

7. Subtract sum of Step 6 from contract price.

8. Divide 7. by 5.

#### ATTACHMENT 3

[From the Washington Post, Apr. 30, 1973]

#### PRODUCTIVITY AND WORLD COMPETITION

Productivity, the amount that the average worker produces in one hour, indicates our economic strength better than any other single statistic. Because of our very high productivity, we live better than other nations while working shorter hours. Increased productivity is the magic that makes possible higher earnings as well as longer weekends as well as broader social benefits of every sort. It is reassuring to learn that national productivity rose at an annual rate of 4.7 per cent in the first three months of this year. The rate of improvement is maintaining the level of late 1972, and greatly exceeds the 20-year average of 3 per cent.

But the current period is, of course, one in which the economists would expect productivity to be rising unusually rapidly. The big jumps come when production is soaring, typically in the recoveries from recessions. Since most of the industrial nations are now going through similar recoveries, they are also improving their productivity. In recent years, they have generally been doing it a good deal more effectively than American industry. They are closing the gap that once set our industry apart from any other nation's, and they are doing it at a speed that does much to explain our current troubles with international trade deficits, currency devaluations and rising world prices.

From 1965 to 1972, productivity rose by the following percentages in this country and five of its leading trading partners:

	<i>Percent</i>
United States.....	20.0
Great Britain.....	36.6
Italy .....	41.5
West Germany.....	42.0
France .....	53.3
Japan .....	130.3

These figures are taken from the International Economic Report that Mr. Peter Flanigan presented to the President a month ago. The report also observes that, from 1965 to 1970, our export prices rose a great deal faster than those of the other five countries. The disparity in productivity is part of the answer. On the other hand, the report found that from 1970 to 1972, our export prices rose far more slowly than those of the other five. That was result of the 1971 devaluation and a relatively low rate of inflation. Unfortunately, within the past several months our inflation rate has more than doubled and now approaches the very high European rate, casting new doubt over the prospects for trade development in 1973.

As long as our productivity continues to rise, our economic wealth and its accompanying benefits will continue to expand. But, to be candid, there is not much reason to expect any early change in the differences between our performance and that of the other major industrial nations. We are getting richer. But our friends and competitors are getting rich faster, and the productivity figures explain why.

Chairman PROXMIRE. Thank you, Mr. Fitzgerald.  
Mr. Art, please proceed.

STATEMENT OF ROBERT J. ART, PROFESSOR OF POLITICAL  
SCIENCE, BRANDEIS UNIVERSITY

Mr. ART. Mr. Chairman, brevity is not an occupational virtue of college professors, but I shall do my best.

I would like to present the subcommittee today with perhaps a different perspective than it has developed in the past. And I do this because I am not a cost accountant, nor am I an engineer, but rather a political scientist. And as a political scientist I concentrate on organizations.

INEFFICIENCY CAUSES HIGH WEAPONS SYSTEMS COST

There is no doubt about the fact that many of our weapons systems are expensive, I think, because of the inefficiency of the large-scale organizations, whether it be the Department of Defense, or whether it be the defense contractors. There is no doubt that expensive systems are also expensive because of what we have been trying to do over the past 15 years, which is to advance the state of the art. But I think it is very important to underline, at least in my view, that organizational procedures are often very important here, and important in two senses. First of all, many of these organizations—and here I concentrate primarily on the services and the contractors—are in fact doing what is in their own self-interest, or if you prefer, vested interests to do. And I think the merit of an organizational analysis, is that it can demonstrate that many of the past reforms that have been implemented, and many that this subcommittee has suggested, may not in fact deal entirely with some of the underlying structural realities.

UNILATERAL GOLDPLATED DISARMAMENT

I am a little bit worried that a focus on cost overruns will cause us to lose sight of the basic problem. A cost overrun is the difference between an initial estimate and a final figure. In fact, it is possible to still have expensive weapons systems with very small cost overruns. All you need to do is inflate your initial figure. And the result, of course, can be what you yourself, Mr. Chairman, called unilateral goldplated disarmament.

If I may, then, proceed in this fashion, I would like to outline what I think are the four basic organizational realities that we are dealing with, and then in shotgun fashion give you eight or nine recommendations which I do not think represent ironclad recommendations or panaceas, but which I look upon as areas for further study, that on the basis of other countries experience or logical analysis, seem to merit some further study.

ORGANIZATIONAL ESSENCES CAUSE GOLDPLATING

The first organizational reality is very simple. The services want to preserve their organizational essences. The Navy; for example, looks upon ballistic-missile-carrying submarines not as something that the Navy should do, but rather that is a service done out of patriotism to the country. Air Force officers like to fly airplanes, they do not like to

monitor missiles on the ground. All our services since World War II have had very clear ideas of what in fact is their ethos or essence.

The second general organizational reality is that the services have tremendously strong incentive to goldplate their weapon systems. I think there are three reasons for this, two of which I do not think are as clearly understood as they should be. And if they are understood, I think their import is to direct the focus of many people away from, if you will, implementation, that is, service contractor relations, and into the bowels of the Pentagon, where in fact these new systems are generated.

The first reason for the incentives to goldplate on the part of the services is very clear. The services like to have the operational edge in quality. In a study I did several years ago, the epitome of that view was reflected by General Spatz when he said that "a second best airplane is like a second best poker hand, no damn good." The services and military men should want good systems. The question is, what is the difference between good enough and best enough, and what does best enough mean? A problem I would like to turn to in just a moment.

The second general reason why we see very strong incentive to goldplate has to do with where requirement for new systems come from.

Now, I think this is not a clearly understood problem. And as an outside analysis, I must frankly admit that I am not completely sure how it works. I am also not certain that people outside of the Pentagon, or in fact those inside of the Pentagon, understand how it works. But what I have been able to gather from studies that I myself have done or read, is the following.

MOBILIZATION MENTALITY—MILITARY EMPHASIS ON QUALITY, COST  
IGNORED

The requirements for most new systems are generated from below; that is, from operational officers in the field. This has an important effect on the kind of requirements that military superiors and civilian superiors are presented with; that is, the emphasis is immediately put on operational quality for that performance edge. A tank commander is going to worry about getting the best tank, not about how costly these tanks will be in terms of the number of howitzers that the Army will be able to buy, for example. That would be a problem that would not be so difficult to deal with if it were not for the third factor—and I have seen very little mention of this in public hearings or public discussion—which is that the services in their own interests are willing in the short term to trade quantity for quality. They are willing in peacetime to have more expensive systems and to have fewer of them.

The reason is that in fact they have a mobilization mentality. The services basically view themselves in peacetime as gearing up for war. And gearing up for war in peacetime means something very simple when it comes to expensive weapons systems. It is to have them developed so that when war occurs you not only have some on hand, but you can quickly get your contractor to produce them. In other words, I think there is an inevitable bias within the services not to be put in a position to have to develop new weapons systems during war. The calculations of the services are in fact based upon sound historical experience, and I suppose if I were a military officer I might be doing

much the same thing, which is putting the emphasis in peacetime on developing good weapons systems, knowing full well that once war occurs, Congress will, as it has done in the past, come through with the money. In other words, the services have their own organizational interest to goldplate; and given this mobilization mentality, adding to it the fact that requirements are developed from below, it is no surprise that there are tremendous incentives on the part of the services to get that operational edge in performance, to get airplanes that fly faster, or missiles that go quicker and hit more accurately, or submarines that can run more silently, et cetera. This produces some very strange outcomes which to we civilians looks unbelievable. Yet, from a service perspective they are doing exactly what they think is necessary in their own interest. And I think historically it has been demonstrated that they have been able to get what they want, which is quality in the short term and quantity in the long term.

#### SERVICES SHOULD NOT MAINTAIN CONTROL OVER ACTUAL DEVELOPMENT

The third general organizational problem is that the services have maintained control over actual development. There are really two areas I think it is important to focus on. The first is requirements, how they are generated, and who makes decisions. The second is the area of implementation. It is very clear to me from the study I did earlier that the contract system between the services and the developers has leaked like a sieve, if I may use that analogy. Implementation is extremely important here. Since the services have been the ones that have controlled the actual development, what has happened is that the political leaders at the top may have made some very clear decisions, but in daily management, given the mutual interest that the services and the contractors have in goldplating, what has in fact happened is that top superiors have been presented with *fait accompli*'s. The services have controlled implementation.

#### SHARED INTERESTS CAUSE HIGHER PRICES

The fourth area is the one that has been the most publicized. I think it is an extremely important area. It is the one which is the most difficult to get leverage over. And that is the mutual service contractor incentive to goldplate. I have often thought that the relationship between the services and the contractors is like labor management collective bargaining. There are some interests that are opposed, but there are many that are shared. And whether it be the taxpayer or the consumer, both end up paying for collusion. I think, simply put, the reason contractors have tremendous incentives to goldplate is, not only to win contracts and to satisfy the services, but in fact to make more money. It is not clear to me that the defense firms make a rate of profit that is higher than they are entitled to. I am not certain it is clear to anyone. What is clear is that overruns range anywhere from 100 to 600 or 700 percent on all contracts historically. Profits on the total cost of a system on the average amount to only about 6 percent of the total cost of a contract. What seems to be obvious, then, is that the size of profits per se, while it may be of interest from an equity standpoint, is not the crucial factor in locating the reason for over-

runs. And I would assert to you, Mr. Chairman, that it is not the size of the profits that is important, but rather it is the way or manner in which they are determined.

#### DON'T TIE PROFITS TO CONTRACTOR INEFFICIENCY

I am glad to see that this subcommittee has focused on hearings that I read earlier, I believe last year, on the area of contractor capital investment. I urge this subcommittee to make certain that in fact that program is going to be implemented, and in a vigorous manner. There is nothing more invidious in contractor service relations than tying profits directly into the inefficiency of our contractors.

But the major reason why our contracts have leaked like a sieve is due to the device of contract change orders, which I understand run to literally thousands on any major system. And whether we have had incentive contracts or cost plus fixed fee contracts, or whatever, the effects of the contract change order is to make every change an opportunity to reopen the basic terms of the contract, due, I think in large part, to interface problems. The device of the contract change order, in other words, has had the effect of converting all of our contracts, those of incentive types in the sixties included, into cost reimbursement-type contracts.

If you accept that these four areas are an accurate description of the institutional problems that we are dealing with, I would like, in quick fashion, to tick off some recommendations that I have which I think deserve further study, but which I firmly believe are in the right direction.

#### USE INTERSERVICE RIVALRY TO REDUCE, NOT TO INCREASE, COSTS

Dealing with the problem of organizational essence, again as a student of organizations, I do not feel that it is possible to change how an organization defines its essence in the short term. What is clear is that in fact we have had interservice rivalry for the last 20-some years, and as long as we are going to have three services, we are going to have interservice rivalry. Therefore, my first and second recommendations are, simply put, to use interservice rivalry to our advantage. The thrust of Congress in its look into the Pentagon has been historically, since World War II, not really to focus on how the services disagree with one another—with a brief flurry, I think in the forties—but rather to ask various services how their proposals on the annual budget differ with what the President or the Secretary of Defense is recommending. I can think of no better way for the Congress to begin to get a better handle on the quality of recommendations that the services are presenting them to ask an Air Force officer how a Navy carrier, a proposed new Navy carrier, is going to impact on his request for bombers. I can think of no better way, in other words, to use military experts than to in fact do what was informally done in systems analysis in the sixties, which was to get officers to criticize, or perhaps suggest a better way to analyze the proposals of their sister services.

My second recommendation would be that this should definitely be done within the Defense Department. It should be made clear by civilian superiors that allocations for the services are not fixed in any one year. The total budget in fact may be fixed or constrained. But any-

thing goes in any one year. And what each service gets depends in part upon the quality of the arguments they make in defense of their own programs against the critique by others. And the implementations of that is that they should be able to justify their requests in terms of other services' requests.

If I take the secondary service incentives to goldplate, I have two recommendations, both of which build upon ideas that have been floating around for a long time. If, in fact, the thrust of service interest is to maximize quality in the short term at the cost of quantity, because they know that in the long term they are going to get quantity, then nothing that we—I should back up and say, the easiest way to gain leverage over that problem—is to deal with it directly; that is, organizationally.

#### TIE THE NUMBER OF UPPER GRADE SLOTS TO FORCE LEVELS TO REDUCE GOLDPLATING

My two suggestions are the following: We ought to begin thinking about doing what the Swedes do, which is to tie the number of upper grade slots to the size of the forces that the services have. That would give the services a direct incentive not to goldplate, because the fewer number of systems that they have and the fewer number of units that they have, the fewer the number of officers they are going to be able to promote at the upper ranks.

#### DETERMINE ACCURATE MILITARY REQUIREMENTS THROUGH OCCUPATIONAL TESTING

A second way to gain leverage, I think, which is very clear from studies done in the past, is that civilians and the Congress must find ways to intervene earlier in the requirements process. I think we have to understand that there is a political problem here for the Secretary of Defense and the President. There has been tremendous logrolling by the Joint Chiefs of Staff in the sixties, in united opposition to centralization from the Office of the Secretary of Defense. What is necessary, in other words, is to avoid having Secretaries of Defense and Presidents or Members of Congress presented with the united logrolled standards by the Joint Chiefs of Staff. And the way to do that is to get in as early as possible as to how requirements are set. Jacob Stockfish of the Rand Corporation has recommended one idea, operational testing, which basically consists of testing upgraded existing systems to give you an idea under real combat simulated conditions, not merely field exercises or computer simulation, what in fact are the bases for military requirements, either in terms of the numbers of systems that they want, or in terms of the quality of the particular system that they want. It is not clear to me how some of these requirements are set. I think it no accident that the post-World War II Navy request for 15 aircraft carriers, which they have argued for consistently, was in fact the same number of capital ships they were allowed to have by the Washington Naval Treaty of 1922. It is not, in fact, clear, in other words, why requirements are set, where the numbers come from, how they are picked out of the hat, or if they are in fact picked out of the hat. Operational testing may give both the services and the

civilians a better idea of what they are talking about, much better data on what requirements are.

The corollary of that is that you need to resurrect, I think, an effective systems analysis office. There is no alternative in my view, to having an active staff serving the Secretary of Defense in this regard to give him information for his needed overall perspective. I am not persuaded that the Systems Analysis Office, post-McNamara, is, in fact, doing very much.

#### MILITARY SHOULD NOT HAVE TOTAL CONTROL OVER WEAPONS DEVELOPMENT

My next-to-last set of recommendations, numbers 5 and 6, deal with control over actual development. This is my third area, control over actual development. It is clear that the services want to maintain control over their weapons systems because of the importance, not only that these have for fighting wars, but also because of the importance that they have in connection with present and future budgets. I am not completely certain of what is the best way to move here, but it is clear to me that because the services have maintained control over weapons development, over the implementation, that some way must be found to intervene in that actual implementation in a manner such that civilians are not presented with *fait accomplis*. I have two recommendations—one of which I believe reinforced yours, Mr. Chairman—which is to think about the creation of a civilian corps of weapons acquisition managers which will be directly under the Secretary of Defense, which will be a career organization in which military will cooperate closely with civilians on individual programs, but in which the civilians will retain final authority. The central problem, I think, is that the program manager has not had the authority or the incentives to do the kind of things that civilians want him to do. So civilians say, go out and develop a system which should be good enough, but not too costly, and the incentives for the program manager are to get the best system in the quickest possible time, and to in fact forget about the costs.

#### PROGRAM MANAGERS—NOT IN THEIR INTEREST TO PREVENT GOLDPLATING

I think there is a very simple reason here. Most of our program managers have not been of sufficient rank, nor have been on the job long enough, to have the kind of incentives and authority that they need. Simply put, when the services put the emphasis on rotation, on checking in on every possible job for movement up the ranks, program managers are often yanked off the job just when they have begun to develop an understanding of the problem. What has happened is that the program managers have found it against their own personal career interest to prevent goldplating during development, even if they had the incentives to do so. And again, very simply put, they have to satisfy their superiors. And their superiors want a goldplated system because of the mobilization mentality that I referred to earlier.

My recommendation No. 5, in other words, is that we should give further study to the idea of creating a civilian corps of weapons acquisition managers, or give some further thought to how in fact we can get military program managers to do what we want.

NEED FOR INDEPENDENT EVALUATION AND TEST AGENCY TO PREVENT  
GOLDPLATED WEAPONS SYSTEMS

My sixth recommendation—I will merely state it, since it has been around a long time—is to reinforce the recommendation of the Fitzhugh report of 1970, which is to have an independent evaluation and test agency which will serve as a deterrent to and check point for goldplated systems. It may not stop us from getting goldplated systems, but it may have the effect of, in fact, demonstrating that at least they must work before they are produced.

My fourth organizational area is dealing with contractor incentives to goldplate. Since I am short on time I will just touch on it briefly.

My seventh recommendation is that lids should be put on the number and amounts of contract change orders for any given system. There is a problem here of flexibility. A certain amount of flexibility on major systems is essential. I think that the C-5A program and the total package procurement concept illustrated some of the disastrous aspects of lack of flexibility. But we do not want to go to the extreme of having such a flexible system that it is totally open ended. Deputy Secretary Packard several years ago recommended that a lid be put on the number and amounts of contract change orders, but I heard nothing about it since. I think this subcommittee should look into whether, in fact, this policy is being implemented.

BIGGEST DEFENSE FIRMS SHOULD BE PRODUCERS, NOT JUST DEVELOPERS, OF  
WEAPONS SYSTEMS

My eighth recommendation reinforces the testimony earlier of Mr. Yuspeh. And that is that we should begin to think differently about our biggest defense firms, firms like Lockheed, for example, which do an overwhelming percentage of their business with the Defense Department.

I think we need to reorient ourselves. I think we should begin to look upon these biggest firms not as developers of systems, but rather as producers.

One of the things that Packard tried to do was to end the practice of concurrency. And yet the pressures for concurrencies, I think, are tremendous, not only from the military standpoint, but certainly from the contractor's standpoint. When you have the kind of overhead that these companies do, and a need to keep skilled technologists on the payroll, the pressure to get into production as soon as possible is unbelievably strong. And it is not clear to me that in fact contractual incentives, when the services retain the control over development, are really going to work.

These biggest firms have looked upon themselves not as developers per se, but rather as producers; that is, they are more interested in production, because that is where the money is. And that is why we have seen tremendous buying in the past. If we begin to think about these biggest firms as producers rather than developers of systems, I think it implies the following.

We ought to move toward subcomponent development or competitive negotiation according to the outlines that Mr. Yuspeh gave us earlier. This would be a good way to get smaller firms into the defense business. It means also upgrading of existing systems.

It also implies a move to more austere systems. The general thrust, in other words, is that one of the ways to control goldplating is not in fact to go to those largest firms which have the greatest incentive to goldplate and double our problem by presenting them with simultaneous development of expensive subcomponents. What we can begin to do in other words, is to slow down our rate of technological development, to develop subsystems ahead of time, and to begin to think about our biggest firms as systems assemblers rather than systems developers.

So I would merely end by saying that I am not certain that these proposals are panaceas, but it is clear to me that they deserve further study in touching upon some of the underlying fundamental problems that I feel have missed study in the past.

Thank you.

[The prepared statement of Mr. Art follows:]

#### PREPARED STATEMENT OF ROBERT J. ART

Mr. Chairman and Members of the Committee, it is a pleasure to appear before you today in order to discuss with you a continuing concern of the Committee, namely, the procurement practices and the results of those practices in the acquisition of major weapon systems. Because I am neither a cost accountant nor a scientist, I should like to avoid a discussion of the specific details of particular programs and instead focus on the general nature of defense procurement by viewing it from an organizational perspective. I stress the word "organizational" here because I firmly believe that many of the problems that this country has encountered in the past with its acquisition of weapon systems have stemmed directly from procedures ill-suited to dealing with the fundamental causes of those problems.

Many of the problems that we are all, unfortunately, too familiar with, such as massive cost overruns and gold-plating, occur as a result of the inefficiencies of our defense contractors or derive from the nature of the task they are engaged in. All large scale enterprises have some inefficiency built into them. Advancing the state of the military art is inherently unpredictable and usually costly. Much of the problem, however, is due to the pursuit by people of the self-interests of the organizations of which they are a part.

Before we can prescribe solutions to well-advertised problems, it is vitally important that we understand the incentives of the groups involved in weapons acquisition. And by doing so, I think we can better understand why many of our past reforms have not touched these fundamental organizational incentives. In that spirit I should like to address myself to these two areas: first, to the nature of the enduring problems; second, to some prescriptions that, while they may not "solve" the problems, at least deserve more study than they have received to date.

#### THE ENDURING PROBLEMS

An organizational analysis is concerned with how the ways that we make decisions affect the types of decisions that we make. It must therefore begin with the vested interests and outlooks of the participating groups and analyze how these groups interact with one another. Even a cursory review of the military-industrial bureaucracy reveals the following features that have been fairly constant over the last twenty years, no matter what the particular procedures used to procure our major systems.

(1) Organizational subunits of the military services seek to maintain their identity, perform their conception of their primary mission, and hence preserve what Morton H. Halperin of the Brookings Institution has called their organizational "essence." Each of our military services consists of either a coalition of such dominant essences or of one dominant essence. Air Force officers like to fly airplanes in the sky, not monitor missiles under the ground. The Navy consists of an uneasy coalition between the surface navy and the submarine navy, with the dominant feeling in that service viewing the submarines carrying out sea-based strategic missiles, not as an integral part of the Navy, but rather as a "service" performed by the Navy out of patriotism to the country. The Army

consists of a large number of groups whose character probably only an Army officer can comprehend. I stressed the phrase "dominant feeling" in regard to the Navy, but it should be applied to all our services and their respective subunits. All organizations have an essence or ethos that most of its members believe in deeply. We should not question the sincerity of our military officers, not their patriotism, but rather try to understand the ethos they accept.

(2) One clear ethos has pervaded all the services and cuts across them, namely, their desire to seek increments in the quality of the weapons they buy in order to attain the edge in operational performance, regardless of the cost of that edge, regardless of the numbers of weapons they can buy as a result of the increase in cost, and even regardless of whether the qualitative improvements sought are in fact the ones most desirable for the mission or missions the weapons are intended to carry out.

This has lead obviously to the phenomenon of gold plating, but I'm not certain that it is clearly understood why the services, or the military in general, want to gold plate when *they* themselves are well aware of the cost that they must pay—fewer numbers of weapons. I think there are two basic reasons why our military officers have been willing to trade off quantity for quality, even when it appears to others that this decision is absurd because it may lead to what you, Mr. Chairman, have aptly referred to as "unilateral goldplated disarmament."

The first reason is embedded in the manner in which the services define and approve their requirements. This process is not as clearly understood by outsiders as it should be and I urge this Committee to give it high priority when considering what further matters in the process of weapons acquisition it should look into. From studies I myself have done or have read, it appears that requirements for new weapons, and the initial definition of their performance parameters, "bubble up" from below, from the users in the field.

Because the initial requests are made by operational officers in the field, they naturally will stress the operational qualities they desire. And the perspective of that given officer is to consider only the weapon he must fight with in order to successfully perform the task he has been given.

There is thus an initial bias to gold-plate any given weapon because each of them is considered alone, in isolation from the rest of the service. As this request passes up the chain of command, it is viewed by officers, all or most of whom have been operational men themselves and all of whom believe that that edge in operational performance is absolutely essential to win. General "Tooey" Spatz once expressed well the perspective of the operational officer: "A second best airplane is like a second best poker hand—no damn good!" The men at the bottom gold plate in the requests they make for new weapons; the men at the top usually ratify their requests. Many of our programs are thus doomed from the start to massive cost overruns, or to high cost even if they experience a small overrun.

A tank commander should not be expected to think about the impact on howitzers that his request for a new tank is likely to have. But we could expect the Chief of Staff of the Army to worry about this. To a certain extent he does, but not to the extent that many of us think he should. The reason is quite simple: the Chief of Staff wants the best tank and the best howitzer that he can buy even when he realizes that getting the best of each means that he will *in the short run* be able to buy fewer of both. The services are willing to trade off quantity for quality in the short run because they have what can only be described as a "mobilization mentality." During peacetime the services consider their natural function to be to prepare for war, but they go about it in a certain way.

The point of peacetime planning is, not to field the forces for war, but to prepare the base for war so that when war comes the country's military forces can quickly build upon the base constructed in peacetime. This peace-should-be-used-to-build-the-mobilization-base-for-war attitude goes a long way to explain why the services in peacetime are willing to accept large cuts in the size of forces in order to get the quality they want in their weapon systems. From the standpoint of weapon systems, building the base in peacetime means developing the weapons they will need in war.

If war occurs, it is better to have high quality weapons already developed than to have to develop them during the course of the war. The calculation is that during a war Congress will come forward with the necessary funds to buy those weapons in quantities sufficient for the task at hand. The purpose of peacetime planning is therefore to plan for those things that you cannot do easily during the pressures of war. Peacetime planning is thus mobilization contingency planning, and, I might add, this mentality is by no means irrational from the standpoint of

the services. Their historical memory causes them to view peacetime as a "lean time" during which one should concentrate scarce resources on the most necessary tasks.

What seems irrational to we civilians is a perfectly natural thing to do when viewed from the service perspective. Their mobilization mentality accounts for why they are willing to accept cuts in quantity for increments in quality in peacetime: they do not think that such cuts in quantity will be permanent; they do not want to be in the position of having inferior weapons when they need them.

(3) The services have largely controlled the development of weapons systems and their production because of the institutional "bread and butter nature" of these systems. Control over the types of weapons that are developed and produced are viewed by the service, not only as crucial to winning any wars they may have to fight, but also as central to the maintenance of their organizational autonomy, distinctness, and claim over defense resources, both present and future. Organizational subunits within each of the services and the services in relation to each other compete for shares of the defense budget, but because resources in the short term are viewed as fixed, the subunits and the service have engaged in considerable backscratching and logrolling in order to divide the fixed pie among them. During the forties the services engaged in bitter battles over doctrine and strategy.

During the fifties they muted their struggles with one another and used their prescribed share of the defense budget to build what they wanted. The result was the duplication of the fifties we all know too well. During the sixties when the McNamara system tried to enforce, not only budget allocations to each of the services, but also how each service had to spend the amounts allocated to them, the services reacted strongly and the Joint Chiefs engaged in collusion in order to protect themselves.

The threat from the Office of the Secretary of Defense appeared greater than the threat each could provide to the other. The result was still the same as the fifties; considerable duplication but achieved through conscious logrolling. Thus whether the services have faced an aggressive or a passive Secretary of Defense they have developed techniques to cooperate with one another to preserve their control over how they will spend their money. Interservice rivalry still exists, but the services have learned how to avoid letting it harm their organizational autonomy.

Service control over the development and production of major weapon systems has meant that even when civilians have intervened in the initial decisions or the setting of service requirements, they have still been unable to control the outcomes. Because the services largely control actual development, they have been able to determine how decisions have been implemented. The concrete manifestation of service control over development is the difficult position the program officer or manager finds himself in. All our civilian defense managers have recognized the crucial importance of program managers, but it is not clear that they have understood the incentives that the military manager operates under. Almost all program managers are middle ranked military officers.

Even if they had the will to control cost growth by controlling gold plating, the bureaucratic structure of program development makes it nearly impossible for them to do so. These program managers are under severe pressure from their military superiors to check constantly with them about the course of any major system. Major systems are, by definition, those that are viewed by the top brass as essential to the serviceman's autonomy, and they therefore take a keen interest in the daily detail of system development. The results of this active involvement are two: diffusion of the program manager's resources and layering of qualitative improvement.

Almost all program managers have complained bitterly about the amount of time they have to spend in getting decisions cleared through the bureaucracy. Admiral Rickover has testified that "a program manager today would require at least 48 hours a day of his own time just to satisfy the requests for detailed information from the Service and OSD bureaucracies, the Congress, the General Accounting Office, and various other parties who have the legal right—and use it—to place demands on his time. As long as you operate a system where the checkers (those charged with the responsibility of approving and evaluating) outnumber the doers (those responsible for directing the work) the doers can do little but spend their time responding to the checker." Layering of qualitative improvement means that each officer on up the military hierarchy adds his own requirement to the system.

The clear result is that as the system goes up the military chain of command for review and approval, operational improvements are layered or added one upon the other. Or, if this does not happen, none such improvements initiated at the lower levels are usually knocked out. Given the relatively low status in the military hierarchy that the program manager holds by virtue of his rank, he is powerless to stop this layering, unless of course he chooses to buck his superiors and in the process risk bad marks on his efficiency rating. Thus, if the general service mentality lies in gold plating, program managers inclined to hold it to a minimum have little bureaucratic "clout" and personal incentive to do so.

(4) The service incentives to gold plate their weapon systems stem from powerful organizational incentives. The defense contractors, for different reasons, have the same such incentives to gold plate and have cooperated with the services in the past in doing so.

The basic reason is, of course, money. Contractors can make more profit by building gold plated systems than by not doing so. It is not the size of profits per se that accounts for the large overruns that our major systems have experienced. Profits account for only about six percent of the total costs of a system; overruns amount to anywhere from 100% to 500% of estimated costs. Defense firms may in fact earn more profit on net worth than they are entitled to, but even if profits are higher than comparable firms doing comparable commercial business, the relative size of their profits accounts for little of the overruns experienced on major programs. It is not the size of profits but the *manner* in which they are calculated that explains the perverse incentives of the contract system.

Contractors are allowed to make a profit on "allowable costs," and these include, not only what the firm spends on labor, materials, and overhead, but also on all those changes introduced into the contract by the service during development. It should therefore come as no surprise that contractors have cooperated with the services in devising contractual loopholes to permit gold plating to occur during development. The contract changes order has been the most used loophole and its effect has been to render every type of contract, incentive types included, into a cost-reimbursable arrangement. Contract change orders, which legally permit a contractor to rewrite the original terms of the contract, have literally run into the thousands on all our major systems.

Every such change order is a hunting license to enhance quality of performance in order to make more money. The net result of this service-contractor mutual interest in gold plating during development has been the inability of civilians to monitor the implementation of the decisions they have made. Delegation of daily management of programs to the services has meant that they have usually presented their civilian superiors with *fait accomplis*.

#### PROPOSALS FOR REFORM

The above four parameters of the problem—that the services seek to maintain their ethos as they conceive it, that they gold plate their weapons, that they control actual development, and that the defense contractors cooperate with them in gold plating—all point to the single conclusion that the pressures for expensive weapon systems are severe, powerful, and institutionally grounded. The underlying, deeply-rooted nature of these pressures explains why many of the reforms tried in the past failed to do what they were intended to do. The contract incentive mechanisms of the sixties, for example, failed to bring down the costs of our systems because they were not powerful enough to override the institutional incentives working in the opposite direction.

These institutional pressures also show why some proposals for reform are ill suited to dealing with the problems. Galbraith, for example, has called for the nationalization of our biggest defense contractors in order to control what they do. I can think of no better way to solidify further the cozy relationship between the services and the contractors than to nationalize the latter. The little ability that we have had in the past to control cost growth has depended upon the adversary relation between industry and government. Nationalizing the biggest defense firms will, in my view, only have the effect of removing what little adversary aspect is left to service-contractor relations. These relations are akin to labor-management collective bargaining. Some interests are opposed, but many if not most are shared. The result has been collusion at the expense of the taxpayer. Nationalization without some institutional mechanisms to counteract service-contractor vested interests will only make it easier for the two to gold plate; with the proper institutional mechanisms, nationalization is probably unnecessary.

It is always easier to outline the nature of the problems that one is trying to solve, or to criticize the solutions to them proposed by others, than to come forward with hard and fast solutions of your own. Nevertheless, I think that the organizational nature of the problems as I have outlined them gives us some clues as to how we should *organizationally* deal with them. Let me take each of those four problems and discuss what mechanisms we might consider in order to cope with them.

1. *Dealing with organizational essence.* In the short run, there is little that anyone can do to alter an organization's sense of what it is supposed to be doing. These changes only come in the long run and occur as a result of pressures from outside the organization. The Navy, for example, only adopted the carrier after World War II proved the value of aircraft carriers. In the interwar period Billy Mitchell's efforts went for naught because those admirals at the top were battleship admirals and hence not receptive to his innovations, particularly since they threatened the dominance and military effectiveness of battleships.

The services will continue to define their missions in ways that those at the top of the chain of command conceive appropriate. That is an institutional fact of life and I think it naive for us to reason that the services and their respective subunits will change their outlooks merely because they are asked to do so by civilians. If we take this as a given, however, we may be able to use it to our advantage. One of the major reasons that we have three services is because the United States Congress has calculated that it would have better access to information and hence an enhanced ability to influence military policy if there were interservice rivalry than if it confronted a monolithic defense department. In getting information, though, Congress has focused almost entirely on how the President's proposals for each budget differ from what the respective military chiefs recommended to him.

Little or no attention has been directed to how the services see their proposals in relation to one another. My *first* recommendation is therefore that Congress and particularly this Committee give serious thought to ways that it can use interservice rivalry to obtain critical information on the specific proposals that each of the services make. When you ponder the question for a moment, there may be no person better qualified to view critically the need for another aircraft carrier than an Air Force officer who sees that more carriers are likely to mean less strategic bombers.

My *second* recommendation, one that most civilian analysts seem to agree with, is that the Secretary of Defense encourage the services to criticize one another on their proposed systems and operational requirements. This was done to an extent in the Systems Analysis Office of the Pentagon during McNamara's tenure, but has disappeared from view under his successors. The Secretary of Defense can encourage this service criticism by making it clear that allocations of the defense budget are not fixed, but depend upon the arguments that the services make to defend their own systems and to criticize those of the others. Both of these recommendations, although they are vague as to specifics, call upon us to reorient our perspectives away from interservice unity to interservice rivalry. We have not taken maximum advantage of the leverage that that endemic rivalry presents to us.

2. *Dealing with service incentives to gold plate.* Because the services consider themselves during peacetime to be preparing the mobilization base for war, any incentives to counteract their willingness to trade quantity for quality must penalize them during peacetime for such a strategy. My *third* and *fourth* recommendations are a start in that direction, but by no means comprehensive. *Third*, I would recommend that serious thought be given to tying the number of field grade officers that are allocated to the number of operational units in existence in their force structure. Fewer full strength air wings will mean fewer generals. This is the method employed by Sweden and the incentives not to trade quantity for quality are quite severe and appear to have worked well.

I suggest that this Committee give some attention to the way the process works in Sweden in order to see whether we can adopt it here. I realize that the subject of career structure is a quite complicated one, but it is not as far removed from the subject of weapons acquisition as one might consider. Restructuring the military career system might be one of the least costly and most effective ways to deal with the astronomical growth in our weapons. I think the time also opportune because the cost of an all-volunteer force is causing many to have second thoughts about its wisdom. My *fourth* recommendation is that the civilians in the Pentagon find ways to intervene earlier in the requirements-setting process.

One such way may be for Congress to institutionalize what Jacob Stockfish of the RAND Corporation has called "operational testing."

Before any service gives approval to a new weapon, it must document to the full satisfaction of the Secretary of Defense that the system has proved its merits under combat simulated conditions. New weapons are not required for this. That is, we need not develop the weapons first before we decide whether we need them. Upgrading of existing weapons, by modifying them to approximate those that the services want, can serve as a base for estimating the combat utility of additional quality increments. Such an exercise may have the added benefit of demonstrating to the services that upgrading existing systems may be militarily as effective as completely new ones, with less cost.

By forcing the services to demonstrate through hardware, combat-simulated testing that they can make a reasonable case for new systems, they may find that the case is not so reasonable after all. But at the minimum civilian superiors will have the information necessary to make better decisions. One of the great failures of the systems analysis operation of the sixties was that it had to rely almost totally on service provided statistics, which were themselves quite unreliable.

Many of the debates and decisions were based on figures that neither side could have much confidence in. Often the most that systems analysts could do was to point out that the service figures were not exact, defensible, or even available. But the task of developing their own figures with which to analyze service requests was a formidable task and one, I doubt, that any small civilian group can do with any claim to comprehensiveness. The interpretations that the services and their civilian superiors may put on figures developed as above may differ, but at least they will all be working with something more reliable than they have had in the past.

3. *Dealing with service control over actual development.* Because implementation is so crucial to weapons development, this area is critically important. But I think we must recognize that no matter what system we devise, the participation of the services is of the utmost importance. What must be done is to determine a mechanism that incorporates needed service expertise but that does not entail the difficulties of the present process. Military officers must be involved in the actual development of hardware, but program officers must be given the authority to make decisions on grounds freed from dominance by their superiors who control their promotion. Our past Secretaries of Defense have recognized the importance of the military program manager to the overall success of program development.

Robert McNamara said in 1963 when testifying before the House Committee on Government Operations: "I want to look to a point of central control and information in the form of a program manager for each major weapon system. . . . He shall be rewarded in his career for prompt and analytical disclosure of his problems as well as for his successes. This is a key position in our military departments, demanding the best managerial talents on which I want to place full reliance for our future weapons inventories."

Recognition of their importance, however, has not been equivalent to solving the bureaucratic pressures under which they operate. Deputy Secretary David Packard in 1970 noted the following before the House Appropriations Committee: "With the long tradition of putting a general in charge of the battle, or putting an admiral in charge of a fleet, one would think it would be easy to get the Services to accept the proposition that you should have one man with authority in charge of a weapon development and acquisition program. We have been able to get this done in a few isolated cases, but it simply has not been fully accepted as a management must by any of the Services." Cooperation by the services has not been forthcoming for at least the last ten years.

My *fifth* recommendation is therefore that Congress give serious consideration to ways to force the services to upgrade the importance of program management and to unencumber their program managers, or, if that is not thought possible, to study the feasibility of creating a corps of civilian program managers, trained in weapons development, under the aegis of the Secretary of Defense, with civil service status, and working in conjunction with military officers on particular programs but retaining the ultimate right of formal powers of decision. My calculation is that if the services were seriously threatened with such a civilian corps, they would quickly come through with the types of reforms to program management that they have been unwilling to make so far.

My *sixth* recommendation is to reinforce the recommendation made three years ago by the Fitzhugh Blue Ribbon Panel, namely, to create an Evaluation and Test

Agency independent of service control. Producers and users of a product should not be the ones charged with the task of evaluating whether it performs in the ways it was prescribed to. Again, this agency should be put under the Office of the Secretary of Defense and should be charged solely with the task of testing developed systems in order to certify whether they work and if so, how well they perform. The virtue of this agency is, not that it will prevent gold plated systems from being tested or developed, but at least it will certify whether they do indeed work and if not, prevent us from buying them until they do.

4. *Dealing with contractor incentives to gold plate.* Many intelligent reforms in the weapons acquisition process were made by David Packard when he was Deputy Secretary of Defense. If they are properly implemented and seriously followed, they will go a long way towards preventing the excessive cost overruns we have experienced on almost every major development program. I can only reinforce them by stressing my agreement with the "fly-before-you-buy approach," symbolized by prototype competitions, hardware testing, and ending of concurrency.

I have also noticed this Committee's interest in DOD's plans to begin considering the amount of capital investment contractor's make when considering contract awards and rates of profit. I hope you shall continue to push the Defense Department to take this program seriously because nothing has been so perverse in our contracting system as has been the direct correlation between inefficiency and profit. Because the program is not slated to begin until 1974, it is too early to determine whether it is being implemented with the desired effects. But it is a crucial area that the Committee must not lose sight of.

My *seventh* recommendation is to make certain that lids are put on both the number and amounts of contract change orders that can occur on any given program. Some procedures must be developed to implement this policy sensibly and with due consideration to different types of programs, but unless something is done to control the contract change order, every contract will continue to leak like a sieve and many of the above reforms will be for naught. I ask the Committee to inquire whether and how this policy is being undertaken.

My *eighth* and last recommendation, Mr. Chairman, has to do with with the manner in which we ought to treat our largest defense contractors, companies like Lockheed, Grumman, and General Dynamics. In the past we have looked upon these companies as developers of our big weapon systems, but they have viewed themselves primarily as producers. To us development was the most crucial aspect of the weapons acquisition process in that we were looking for a new product. To the companies, however, production was of the greatest interest because that was where the big profits were. As a result of our interest and their perspective, buying into contracts was a common phenomenon and I would imagine that it is still pervasive. We ought to ask ourselves whether all of the above reforms can really deal with this problem.

One of the severest tests of the ability of contractual mechanisms to prevent buying in was the C-5A contract and the total package procurement concept. We all know the results of that effort. I am not certain that I have any panacea to deal with this problem, but I suggest that part of the answer lies in reorienting our attitudes towards these big firms. Instead of looking to them as the primary source of our developmental expertise, we should wherever possible look elsewhere for that and instead consider these big firms as assemblers and producers of products developed by other bodies.

The pressures for concurrency in these big firms is immense because the cost of their overhead and engineering staff is such that they want to minimize the time between development and production in order to save costs. The pressures will continue to exist no matter what types of contracts we apply and even if we take prototype competition seriously. Moreover, as long as these firms continue to have the overhead and skilled labor costs they have, the incentives from the contractors to gold plate will be intense. What worries me is that the daily details of program management often dilute the intent at the top simply because the details are so numerous and so complex that no superior at the OSD level could possibly monitor what is going on before he is presented with some irreversible and probably costly decisions.

By going to the big contractors for weapon systems development, we magnify our problems because we present them with interface problems of incredible complexity. We not only come to firms with the strongest incentives to gold plate and to engage in concurrency, but we have also presented them with programs that require simultaneous advances in the state of the art, all of which must be integrated with one another while they are being developed. These big firms have

reciprocated and have developed the technical staffs to do these jobs. But technologists whose *raison d'être* is to solve complicated and exotic technical problems do not necessarily lead us to solutions that are the most cost effective, nor even the most effective from a military standpoint.

I often think that these big firms have become playgrounds for exotic technologists. Clearly we must begin to abuse ourselves of the thought that better means more technologically complex. One institutional way to do so may be to begin to disengage those big firms from development. If we put more stress on subcomponent development and gave more attention to using governmental facilities and smaller firms, we might begin to drive home the point that exotic technological solutions are not the sole point of weapons development.

If we put the stress on "austere" development and on upgrading existing systems, we can easily integrate subcomponent development into such an approach. The result may very well be that we can do something we have never really had before: *competition* on the basis of cost for program *production*. Surely this general approach deserves more attention and I would hope that the Committee would look into it further. Thank you, Mr. Chairman, and I hope that these comments have proved of some use.

Chairman PROXMIRE. Thank you, gentlemen, very much.

Before we get into the substance of today's testimony, there is some unfinished business, Mr. Fitzgerald, the Civil Service Commission ruled in your favor several weeks ago, deciding that you were wrongfully discharged from the Air Force, and ordered you reinstated with back pay. Has that order been enforced and what is your present status?

#### ON THE REINSTATEMENT OF A. E. FITZGERALD BY THE DEFENSE DEPARTMENT

Mr. FITZGERALD. Mr. Chairman, I think eventually the order will be carried out. It is subject to some interpretation as it was written. My attorneys and I have been having as many discussions as we have been able to manage with the Department of Defense ever since the order came out. As a matter of fact, the attorneys were in discussion with some of their Government counterparts before the decision.

As it stands, I have been offered a position in the Pentagon in the Office of the Assistant Secretary of the Air Force for Financial Management, Mr. Woodruff.

There are a number of issues outstanding, some of which were not even dealt with, even though they were in our initial appeal almost 4 years ago. We are attempting to resolve those. These are such matters as the reimbursement of the enormous costs of the attorney's fees that are necessary to carry on something of this sort.

As it stands, I hope to go back to work in the Pentagon in the very near future. I am very eager to do that, to put as many of the difficulties I have had in the past behind me as possible, and get on with saving money. I think there is an enormous amount of money to be saved. I was stimulated further yesterday by the report on the B-1. But as it stands, I am told that I will not be allowed to work on weapons systems. So it is not clear just how it is going to work out.

Chairman PROXMIRE. Is that not your area of expertise? Is that not the area where you made the greatest contribution? Is that not the area where you received the high award in 1967?

Mr. FITZGERALD. Well, I like to think I have made some contribu-

tions, but you know that is a matter of opinion. I am not the most popular person in the world in the Pentagon, as you can imagine.

Chairman PROXMIRE. Was that not the job you had before you were discharged?

Mr. FITZGERALD. Yes, sir.

Chairman PROXMIRE. Was not the order of the Civil Service Commission to have you given that job again?

Mr. FITZGERALD. Well, they—and this is where the order was a little unclear—ordered the action of the agency in abolishing my job, which they ruled was a ruse to fire me, reversed. Now, if that were to be taken at face value, yes, I would return to right where I was on January 4, 1970. But they added a phrase in the body of the report which said, "or a job similar to that," or words to that effect. So this is what is happening apparently, now.

As I said, I still have hopes, Mr. Chairman. I think the need is great. It has never been greater. There are major problems, and I think that they need all the help they can get.

Chairman PROXMIRE. The need is very great. I think all of us are very aware of that. But far more important is the fact that this is, if not only the only case, the only case I am familiar with, in which a civil servant has been fired following his testimony before a congressional committee, and following revelation of information that was very important to the oversight on the part of the Congress. And this information was considered to be of great value to us. And the Civil Service Commission has acted now in a way that many expected it never would, and in a way that has given us a great deal of heart.

Now, if that action by the Civil Service Commission is to be frustrated by a failure on the part of the administration to, in fact, cooperate with the clear significance of that order by the Civil Service Commission, then it seems to me that the victory that was won on the part of those who have the courage to speak out has been lost.

Mr. FITZGERALD. I have been told in my discussions with the officials in the Department of Defense that even though I will not be initially allowed to work on weapons systems, that if I "prove myself" and gain the acceptance of the staff, that I may be allowed to look at some of the weapons systems. I do not know how to evaluate that. Many of these people are folks that I have not worked with before, Mr. Chairman. And I hate to prejudge them. On the other hand, I would very much like to get back to doing what I was doing before I testified before this subcommittee, which actually was the year before I was fired. It was 5 years and 2 days ago that I first committed truth.

Chairman PROXMIRE. I would not say that you first committed truth.

Mr. FITZGERALD. The first time that it was marked as a deadly sin.

Chairman PROXMIRE. By the way, would you submit to us a copy of the Civil Service Commission's decision reversing the action of the Department of the Air Force in your dismissal?

Mr. FITZGERALD. Yes.

Chairman PROXMIRE. I believe it would be appropriate to insert them in the record and I will do so at this point in the hearing.

[The information referred to follows:]



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Mr. John Dodner, Jr.  
 Attorney at Law  
 1730 Pennsylvania Avenue, N.W.  
 Washington, D. C. 20006

There is transmitted herewith a copy of my findings and recommendation in the appeal described below:

Appeal of: Mr. A. Ernest Fitzgerald

Action Appealed: Reduction In Force

Employing Agency: Department of the Air Force

Decision: Agency Action Reversed

cc: Mr. William L. Sollee  
 Attorney at Law  
 1700 Pennsylvania Ave., N.W.  
 Washington, D. C. 20006

cc: Mr. A. Ernest Fitzgerald  
 1552 Forest Villa Lane  
 McLean, Virginia 22101

Sincerely yours,

Herman D. Stalman

Chief, Appeals Examining Office

Enclosure

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JANUARY 1972

UNITED STATES  
CIVIL SERVICE COMMISSION

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APPEALS EXAMINING OFFICE

WASHINGTON, D.C. 20415

*Decision*

ON THE APPEAL OF

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A. ERNEST FITZGERALD

DEPARTMENT OF THE AIR FORCE

WASHINGTON, D. C.

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*Herman D. Staiman*

CHIEF

ISSUED: September 18, 1973

U.S. CIVIL SERVICE COMMISSION, APPEALS EXAMINING OFFICE,  
WASHINGTON, D.C.

APPEAL OF A. ERNEST FITZGERALD, UNDER PART 351, SUBPART I OF THE CIVIL  
SERVICE REGULATIONS

Appeal from the action of the Department of the Air Force in separating the appellant by reduction-in-force from the position of Deputy for Management Systems, GS-17, Step 4, \$31,874.00 per annum, Office of the Secretary, Assistant Secretary for Financial Management, Washington, D.C. effective January 5, 1970.

INTRODUCTION

By letter dated January 20, 1970 John Bodner, Jr. and William L. Sollee, Attorneys at Law, submitted an appeal to this office in behalf of Mr. A. Ernest Fitzgerald. Investigation was conducted and numerous lengthy submissions to the file were received from both the appellant and the agency. The appellant raised a question as to the bona fides of the reduction-in-force (RIF) as it was applied to him, contending that the RIF was used as a subterfuge to conceal the agency's action in firing him because of his November 13, 1968 testimony on the C-5A cost overruns. Since Mr. Fitzgerald was a preference eligible and the various submissions to the file did constitute a prima facie showing that the reduction-in-force may have been based upon an intention to separate the appellant for cause rather than for a nonpersonal reason, a hearing was scheduled to inquire into the circumstances surrounding the RIF.

The agency was requested and agreed to make available to testify Secretary of the Air Force Robert Seamans, Assistant Secretary Spencer Schedler, Administrative Assistant to the Secretary John Lang, Deputy Administrative Assistant Thomas Nelson, Air Force Chief of Staff General John D. Ryan, Comptroller of the Air Force Lieutenant General Duward Crow, Director of Office of Special Investigations (OSI) Brigadier General Joseph J. Cappucci, and Colonel James D. Pewitt.

In accordance with the Civil Service regulations in effect at that time, the hearing was not open to the public. However, a verbatim transcript of the proceedings was prepared by an independent court reporting firm. The hearing was conducted on May 4, 5; June 16, 17, 18 and 22, 1971. On the latter date the hearing was suspended in compliance with a temporary restraining order and subsequent injunction issued by the U.S. District Court for the District of Columbia relative to the issue of an "Open Hearing." The hearing, open to the public, resumed on January 26, 1973 after all litigation on this issue had been completed. Additional hearing sessions were held on January 29, 30, 31; February 2, 28; March 5, 6, 7, 20, 21, 22, 28, 29; April 3, 4, 5, 6, 19; and May 3, 1973.

Since the 1973 portion of the transcript begins again with page #1, reference to the 1971 portion of the transcript will be shown as "L/N" while reference to the 1973 portion will be shown as "TR." On May 3 and 4, 1971 the agency submitted copies of documents previously furnished to the Justice Department. The pages are numbered consecutively from 1 to 117 with two (2) pages numbered 95. This submission will be referred to as the "Justice File" and the two pages 95 will be referred to as 95a and 95b. On June 25, 1970 the agency submitted 409 pages of documents in response to the appellant's request. This submission will be referred to as "AF-6/25/70." All agency submissions will be referred to as "AF-(date)" and all appellant's submissions will be referred to as "APP-(date)". Exhibits submitted at the hearing will be referred to as "M.Ex" for management and "A.Ex" for appellant. Senator William Proxmire was Chairman of the Subcommittee on Economy in Government of the Joint Economic Committee, Congress of the United States. This Subcommittee will be referred to as the "Proxmire Committee." The office of the Assistant Secretary of the Air Force for Financial Management will be referred to as "SAFFM," its Air Force symbol.

Final closing arguments, in the form of no reply written briefs were received from the Air Force on July 16, 1973 and from the appellant on July 17, 1973. While the record was technically closed as of May 3, 1973 a newly discovered memorandum that had just surfaced in a Senate hearing was submitted by the appellant on August 2, 1973. No objection or comment was offered by the agency, therefore, the document was accepted into the record.

A verbatim transcript of the entire 26 day hearing proceeding is a part of the official record in this case. The appellant was represented at the hearing by his attorneys, John Bodner, Jr. and William L. Sollee. The agency was represented

by Lieutenant Colonel C. Claude Teagarden, Office of the General Counsel, Department of the Air Force, and Hugh R. Gilmore, Assistant General Counsel, Department of the Air Force. Testimony at the hearing was obtained from the appellant and thirteen of the witnesses he requested. The agency called no witnesses and presented its case through the cross examination of appellant's witnesses, the introduction of new documents, and reliance on the material previously submitted.

#### ANALYSIS AND FINDINGS

By letter dated November 4, 1969 the agency gave Mr. Fitzgerald notice of his proposed separation by reduction-in-force, effective January 5, 1970, due to the abolishment of his position, "necessitated by a reorganization under the current Air Force retirement program." This notice indicated that his assignment rights were to positions in the Excepted Service. The Standard Form 50 (SF-50), Notification of Personnel Action, effecting the separation on January 5, 1970, identified the position as being in the Excepted Service.

Mr. Fitzgerald contends that he was granted career tenure in the competitive service on September 20, 1968 and that it was improperly taken away from him on November 25, 1968 after he testified as to the cost overruns on the C-5A airplane. Accordingly, we will deal with this issue first.

The record reveals that on September 20, 1965 Mr. Fitzgerald received an Excepted-Conditional appointment to the position of Deputy for Management Systems, GS-301-17, in the Office of the Assistant Secretary of the Air Force for Financial Management (SAFFM). This position was excepted from the competitive service under Schedule A, Section 213.3109a of the Civil Service regulations. The appointment SF-50 clearly shows in items 12 and 28 that the appointment was to an Excepted Service position.

Effective September 20, 1968, upon Mr. Fitzgerald's completion of three (3) years in the Excepted Service a new SF-50 was issued. In item 12 the nature of the action was shown as a conversion to career tenure; in item 14, the Civil Service authority was shown as Reg. 315.202; and in item 28 the position occupied was shown as being in the Excepted Service. On November 25, 1968 a new SF-50 was issued correcting item 12 of the September 6, 1968 SF-50 to reflect conversion to Excepted appointment and correcting item 14.

Mr. Fitzgerald contends that based upon the September 1968 SF-50 he was converted from the Excepted to the Competitive service and that the corrected SF-50 of November 25, 1968 improperly took away his career tenure in the competitive service.

Section 6-5, Rule VI of the Civil Service Rules relating to excepted employees states:

"No person who is serving under an excepted appointment shall be assigned to the work of a person in the competitive service without prior approval of the Commission."

Section 315.701, Part 315 of the Civil Service regulations concerning conversion of incumbents of positions brought into the competitive service, states:

"(b) An agency, within the time limits set forth in paragraph (c) of this section, may recommend that the employment of an employee covered by paragraph (a) of this section be converted to career or career-conditional employment.

"(d) When the Commission approves the agency's recommendation submitted under paragraph (b) of this section, the employee becomes:

"(1) A Career conditional employee . . .

"(2) A Career employee . . ."

It is clear from the evidence of record, and we so find that the Air Force did not request or receive approval from the Commission to move Mr. Fitzgerald from the excepted service to the competitive service or to move his position from the excepted to the competitive service (A.Ex #1; A.Ex #7, P-286-287; Justice File, P-7; AF-6/25/70, P-114; AF-1/30/70; and TR 2768-2769).

Contrary to the appellant's contention, the perfunctory forwarding of a file copy of every SF-50 to the Civil Service Commission is not an agency recommendation or request for prior Commission approval nor does this serve as the prior approval by the Civil Service Commission for any conversion from the Excepted to the Competitive Service.

Since the Air Force never recommended, requested, or received prior approval from the Civil Service Commission to convert Mr. Fitzgerald from the Excepted Service to the Competitive Service the Air Force was clearly without authority to take action. Therefore, we find that the original conversion action of September 1968 was null and void, and that it was properly corrected by the agency on November 25, 1968.

The agency has contended that the initial SF-50 of September 1968 resulted from a computer error. This is borne out by the fact that item 28 of that SF-50 showed the position occupied to be in the Excepted Service. It is further borne out by item 14 which cited the Civil Service Authority as Regulation 315.202. Section 315.202 of Part 315 of the Civil Service regulations states:

"A career-conditional employee becomes a career employee automatically on completion of the service requirement for career tenure."

The service requirement for conversion from career conditional to career as set forth in Section 315.201 is three (3) years. Mr. Fitzgerald did not receive a Career-Conditional appointment, he received an Excepted-Conditional appointment. Therefore, he had no entitlement to the automatic conversion from Career-Conditional to Career that Section 315.202 provides.

In view of the foregoing, we find that Mr. Fitzgerald was properly in the Excepted Service at the time of his separation on January 5, 1970 and that he had no entitlement to Career tenure in the Competitive Service.

Turning now to the reduction-in-force action itself, the agency's position is that as part of Defense Department's Project 703, the Air Force was required to reduce expenditures one (1) billion dollars in fiscal year 1970. This involved large cut-backs in military and civilian personnel nationwide and in the headquarters staff of the Department. Each office in the Secretariat was given a specific number of reductions to be effected. SAFFM was assigned a net reduction of two (2) spaces. As part of a reorganization of that office five (5) positions were abolished and three (3) new positions were established. Of the five (5) positions abolished Mr. Fitzgerald's was the only professional position. The other four (4) were secretarial positions.

The agency contends that the abolishment of Mr. Fitzgerald's position, initiated by Assistant Secretary Spencer J. Schedler and approved by Secretary Robert Seamans, was based upon a valid management decision to reorganize SAFFM in order to improve its cost effectiveness capability and at the same time achieve the required reduction of two (2) spaces.

The agency further contends that Secretary Seamans and Assistant Secretary Schedler were not in office at the time of Mr. Fitzgerald's November 1968 testimony; that they alone were responsible for the decision to reorganize the financial management office; that the testimony Mr. Fitzgerald gave a year earlier was not the reason or a reason for their decision; and that neither had sought or received any instructions to abolish the appellant's position.

Mr. Fitzgerald contends that the RIF as applied to him was not for non-personal reasons and was, in essence, an agency adverse action based upon his November 13, 1968 testimony on the C-54 cost overruns.

The record reveals that out of the 80 positions abolished in the Office of the Secretary of the Air Force, Mr. Fitzgerald was the only employee who actually was issued a RIF notice and who was actually separated by RIF (L/N 723-724). As his part of the Project 703 reductions, Assistant Secretary Schedler was required to take a cut of two (2) spaces. He accomplished this by abolishing four (4) Secretarial positions plus Mr. Fitzgerald's position and creating three (3) new positions.

The Air Force, through the testimony of witnesses and documentary evidence, did show that a reorganization of SAFFM had taken place; that the appellant's position had been abolished and not recreated; and that there was some need to reorganize in addition to reducing the office staff by two (2) positions.

The appellant has not questioned the validity of the Project 703 reductions and the resultant reduction-in-force, only the agency's decision to abolish his position and include him in that RIF.

The reduction-in-force system as provided for by Statute and Commission regulations is a system for releasing employees from their competitive levels when their release is required because of lack of work, shortage of funds, reorganization, reclassification due to change in duties, or the exercise of reemployment or restoration rights. The system is predicated upon the concept of competition for retention based upon tenure, veterans preference, length of service and performance rating.

Reduction-in-force may be necessary because of conditions inside or outside the agency. Agency management may reduce certain phases of its work as the workload changes. Appropriations may be reduced or cut-off entirely, or the agency may be allowed to use only part of its appropriations. These and other factors occurring singly or in combination may make it necessary for the agency to have a reduction-in-force.

Reduction in force may require the separation of all employees in part of an agency or may require separation of some and shifting about of others. Small reductions may require no involuntary separations, when there are enough transfers, retirements, and other voluntary losses. Some reductions, in fact, require no reduction in the number of employees but are accomplished through reorganization.

Planning the work program and organizing the work force to accomplish agency objectives within available resources are management responsibilities. Only the agency can decide what positions are required, where they are to be located and where they are to be filled, abolished or vacated. The agency determines when there is a surplus of employees at a particular location in a particular kind of work. A surplus of employees in any part of an agency requires the agency to determine whether the employees will be assigned to vacant positions, be adversely affected for reasons related to performance or conduct or compete in reduction in force.

These are management responsibilities and the management determinations regarding these responsibilities are not ordinarily subject to review by the Civil Service Commission in a reduction-in-force appeal.

It would be a valid and proper exercise of its management prerogative for an agency faced with the necessity for reducing its force to select for abolishment those functions and/or positions that are least necessary to the accomplishment of, are making the least substantive contribution to, the agency's mission.

In this situation the lack of substantive contribution may be due to a change in the agency's mission or its method or approach to the accomplishment of its mission. It may also be that the lack of substantive contribution is due to the incumbent of the position.

Inherent in the Commission's reduction-in-force system and one of its fundamental precepts is that it be used only for reasons that are non-personal to the employees affected. The reduction-in-force system must not be used to remove inadequate or unsatisfactory employees in lieu of following the Commission's adverse action procedure set forth in Part 752 of the Civil Service regulations.

Federal Personnel Manual Chapter 351, Subchapter 1 states in part as follows: "1-9. *Improper use of reduction in force.*

"There sometimes has been a tendency to distort the reduction-in-force system by using it to eliminate inadequate employees."

Thus, an allegation that the RIF was a subterfuge to conceal an agency removal action taken without following the adverse action procedures, when supported by a sufficient showing that the RIF action may have been based upon an intention to separate the appellant rather than upon a non-personal reason for reducing the force, goes directly to the question of the bona-fides of the RIF and will be reviewed on appeal.

In order to properly evaluate the propriety of the RIF action as applied to Mr. Fitzgerald it is essential that we review and analyze the circumstances leading up to and surrounding the decision to abolish his position and to include him in the Project 703 RIF.

From our review of the complete appellate record including all submissions by both parties and the transcript of the hearing (26 days), we find the circumstances to be as follows:

Mr. Fitzgerald received an excepted appointment to the position of Deputy for Management Systems, Office of the Assistant Secretary of the Air Force for Financial Management (SAFFM) on September 20, 1965 (AF-1/30/70, Attachment #4). While no specific time limit was established as to the length of this appointment, it is clear from Mr. Fitzgerald's testimony of his conversations with the then Assistant Secretary, Dr. Leonard Marks, that it was to be for only a few years (TR 2618-2621).

Assistant Secretary Marks resigned on December 31, 1967 and was succeeded by Thoma H. Nielsen who was appointed Assistant Secretary for Financial Management on January 1, 1968 (L/N 366). Mr. Nielsen submitted a proposed reorganization plan for his office dated January 9, 1968 (AF-6/25/70, P-253) focusing additional attention on cost performance, designating the appellant as the focal point for this effort and proposing increasing his staff.

Mr. Fitzgerald was first contacted by the Proxmire Committee in the Summer of 1968 to testify on the C-5A (TR 2720-2722). This request was put into writing by Senator William Proxmire on October 18, 1968 (APP-1/20/70, Attachment #2).

The file contains unrefuted allegations and testimony that there was high level Air Force and D.O.D. opposition to Mr. Fitzgerald testifying.

Mr. Fitzgerald did testify before the Proxmire Committee on November 13, 1968 and discussed possible cost overruns on the C-5A plane. This testimony received a great deal of publicity for it was the first public disclosure of cost overruns on that project.

In October 1968 Colonel James D. Pewitt, Special Assistant for Economic Analysis and Acting Executive Officer of SAFFM, was involved in conducting a cost review of the C-5A project. He testified that Mr. Fitzgerald used his (Pewitt's) figures in testifying before the Proxmire Committee (TR 1970); that Mr. Fitzgerald's testimony was accurate; and that the numbers Fitzgerald used were the same numbers he would have used (TR 1969-1970).

On November 25, 1968 a new SF-50 was issued to Mr. Fitzgerald properly correcting an erroneous SF-50 issued on September 6, 1968 which had purportedly granted him career tenure.

By memo dated December 26, 1968, Mr. Fitzgerald furnished Assistant Secretary Nielsen copies of the September 6 and November 25, 1968 SF-50's regarding his tenure and pointed out that the November 25 revocation came less than two weeks after his appearance before Senator Proxmire's Subcommittee.

In response to a December 27, 1968 request from Assistant Secretary Nielsen, John A. Long, Jr., Administrative Assistant to the Secretary of the Air Force submitted a memorandum explaining Mr. Fitzgerald's tenure situation (Justice File P-6). A copy of this memo was delivered to Mr. Fitzgerald by Major Metcalf on December 31, 1968 (M.Ex #7, 1/13/69 attachment).

On January 1, 1969 a front page newspaper article appeared in the Washington Post (attachment to M.Ex #7) clearly implying that the November 25, 1968 revocation of tenure was in retaliation for Mr. Fitzgerald's testimony on the C-5A on November 13, 1968.

In response to request for information (L/N 449-451) due to the implications in the January 1, 1969 Washington Post front page article, Acting Secretary of the Air Force, Dr. Alexander N. Flax sent a memo to the Secretary of Defense dated January 2, 1969, explaining Mr. Fitzgerald's tenure situation AF-6/25/70, P 112-116).

On Friday afternoon, January 3, 1969, Mr. Thomas Nelson, Deputy Administrative Assistant to the Secretary of the Air Force, received a request from Colonel Gunderson of the Air Force Secretary's Office to prepare a paper bringing the Secretary of the Air Force up to date on what was going on with regard to Fitzgerald, and also a discussion of what his rights were, since the Secretary had been out of the office for a week to ten days (L/N 452-453). John Lang furnished this information to Secretary Brown by memo dated January 6, 1969 (M.Ex #44). Attached thereto was a copy of Dr. Flax' memo of January 2, 1969 to the Secretary of Defense. The January 6, 1969 memo is referred to as the "Lang Memo".

Mr. Nelson testified that he assumed the request, "What are his rights" meant what are his rights when he is going to be terminated (L/N 463-466). Mr. Fitzgerald received a copy of the "Lang Memo" from Assistant Secretary Nielsen (L/N 474, 476-477) on January 8, 1969.

The Lang Memo identifies three (3) possible means of effecting Mr. Fitzgerald's departure and states in part as follows:

"As an employee in the excepted service under Schedule A, with Veterans Preference, Mr. Fitzgerald has certain rights, which can be grouped in two categories:

(1) *Adverse Actions.* Chapter 752 of the Federal Personnel Manual applies to discharges, suspensions, furloughs without pay, and reductions in rank or compensation taken by agencies against employees of the United States Government. Mr. Fitzgerald's rights are:

(a) Adverse action may not be taken except for such cause as will promote the efficiency of the service;

(b) He must be given at least 30 full days advance written notice, identifying the specific proposed action, stating the reasons supporting the proposed action, including names, times and places;

(c) The notice must tell the employee that he has the right to reply, both personally and in writing and to submit affidavits in support of his answer;

(d) Normally he must be retained in an active duty status during the notice period;

(e) Full consideration must be given to his reply and if the decision is to effect the action originally proposed, or some action less severe, he must be given a dated and written notice of the decision promptly after it is reached;

(f) The notice of decision must inform him of the effective date of the action, of his right to appeal the adverse action within the agency and to the Civil Service Commission, and of the time limits and procedures for making the appeals.

(2) *Reduction in Force.* In the event his job is abolished, Mr. Fitzgerald is in Tenure Group I in the Excepted Service and has the right of full application of all reduction-in-force procedures insofar as "bumping" and "retreat" rights within his competitive level grouping. However, since he is the only employee in his competitive level grouping and since he did not progress to this position from other lower grade positions, the net result is that he is in competition only with himself. He could neither "bump" nor displace anyone.

These are the rights involved should charges be preferred or should his position be abolished. There is a third possibility, which could result in Mr. Fitzgerald's departure. This action is not recommended since it is rather underhanded and would probably not be approved by the Civil Service Commission, even though it is legally and procedurally possible. The Air Force could request conversion of this position to the career service, utilizing competitive procedures, and consider all the eligibles from the Executive Inventory and an outside search. Using this competitive procedure, Mr. Fitzgerald might or might not be selected. If not, displacement action would follow.

When Mr. Fitzgerald was appointed in September 1965 by Assistant Secretary Marks to fill the vacancy created by the departure of Mr. J. Ronald Fox, it was with a mutual understanding that this was to be a Schedule A appointment of two or three years duration. There is nothing in official records to support this understanding. Dr. Flax contacted Mr. Marks by telephone on January 2, 1969, and verified this understanding and reflected the conversation in his memorandum to the Secretary of Defense, a copy of which is attached. We have carefully screened all files and records and can find no formalized confirmation of this understanding."

Mr. Fitzgerald visited the Civil Service Commission on January 10, 1969 to complain of the alleged loss of tenure and his supervisor's statement that his usefulness to the Air Force was at an end. Therefore, Assistant Secretary Nielsen prepared a memorandum for record (M.Ex #7, 1/13/69 attachment). This memo states that Mr. Nielsen reviewed the entire matter of the tenure controversy with Mr. Fitzgerald who stated that he mailed a copy of the first SF-50 to the Committee immediately after the conclusion of the November 13, 1968 hearing and that when the second form was received it was mailed directly to the Proxmire Committee. The memo also states that Mr. Nielsen told the appellant "I felt his actions in this connection had ended his usefulness to the Air Force".

Secretary Seamans testified it was his belief that Mr. Fitzgerald released the SF-50's in the tenure controversy in order to obtain publicity and to place the Air Force in a bad light (TR 430-431, 435-437); that his actions inflamed the situation; exacerbated relations between Mr. Fitzgerald and people in the Secretariat; and "that's when it became much more of a confrontation" (TR 480-481). Secretary Seamans also stated that Mr. Fitzgerald was a celebrity and a controversial person at that time as a result of the press releases concerning the tenure controversy (TR 438-439).

Colonel Pewitt testified that Assistant Secretary Nielsen gave Mr. Fitzgerald the "Lang Memo"; that Mr. Nielsen felt Fitzgerald "had betrayed a personal confidence" by the way the memo was handled; and that Mr. Nielsen lost confidence in the appellant and his usefulness to the Air Force (TR 1991-1992). Colonel Pewitt also stated that he thought Mr. Fitzgerald's days in the Air Force were numbered and that he might be leaving because of the tenure—non tenure publicity and the Lang Memo (TR. 2121-2122).

It is clear that the "Lang Memo" and Secretary Nielsen's declaration that Mr. Fitzgerald had lost his usefulness to the Air Force both stemmed from the Washington Post January 1, 1969 front page article erroneously implying that the appellant lost his career tenure in retaliation for his testimony on the cost overrun in the C-5A project. It is also evident that the Air Force considered Mr. Fitzgerald responsible for this erroneous implication reaching the news media.

Robert C. Seamans, Jr. took office as Secretary of the Air Force on February 15, 1969. Assistant Secretary Nielsen submitted new reorganization proposals to Secretary Seamans on February 26, 1969 (AF-6/25/70, P-292) and May 5, 1969 (M.Ex #11). Prior to submitting the February 26, 1969 reorganization plan, Mr. Nielsen told Secretary Seamans that Mr. Fitzgerald's usefulness to the Air Force was at an end (TR 526-527). Secretary Seamans testified that the February 26, 1969 proposal was similar to the one that Mr. Nielsen had submitted a

year earlier except for changing the focal point for cost analysis capability from Mr. Fitzgerald to Colonel Pewitt (TR 530-531).

Secretary Seamans testified that on or about April 24, 1969 Mr. Fitzgerald was scheduled to give a talk to the American Management Association on the West Coast for the Air Force. He did not meet that commitment, apparently because he was giving a series of lectures up at the Capitol (TR 559-561; 570-572). As a result, Assistant Secretary Nielsen had to fulfill his commitment in the appellant's place.

On May 5, 1969 Mr. Nielsen submitted his final proposed reorganization plan for SAFFM (M.Ex #11). This plan did not provide for Mr. Fitzgerald's position of Deputy for Management Systems.

On May 7, 1969 Secretary Seamans testified before the House Armed Services Committee in Executive Session and made several accusations against Mr. Fitzgerald. The following quotations dealing with these accusations are taken from pages 2593, 2594 and 2596 of the Committee Hearing report for May 7, 1969 (APP-4/28/71 attachment).

"Secretary SEAMANS. I think if you are looking at the record that you should also note where he is spending time off duty as well as on Government time."

Secretary SEAMANS. . . . I am not saying this is wrong, mind you, but he is working with a group of staff people up on the Hill, among them Congressman Moorhead's chief of staff. He was scheduled to go and make a speech on the west coast, which I approved. He wanted to make that speech. I said go ahead. And then he backed out of it at the last minute because he was so busy up here doing his extracurricular work. We had difficulty filling the speaking assignment."

"Mr. STRATTON. Mr. Fitzgerald is up there now, and has been for the last several weeks, as I understand it.

Secretary SEAMANS. I'm not familiar with detail. I do know there is a group that engages in a so-called seminar. It may be perfectly appropriate, but it is not official Air Force business. It is nothing that has been scheduled with a committee through the Secretary of the Air Force or any other responsible Air Force official."

"Secretary SEAMANS. In my conversation, a little earlier, I was talking about some of the reports that came out of the Holifield committee, some of which are confidential, that as indicated by Congressman Moorhead, he received from Mr. Fitzgerald.

Mr. HUNT. Did Mr. Fitzgerald have the permission of the Air Force to release that information?

Secretary SEAMANS. He certainly did not.

Mr. HUNT. What is being done about Mr. Fitzgerald, then?

Secretary SEAMANS. I'm reviewing the case.

Mr. HUNT. Will you advise use what you are doing with the case when you are finished?

Secretary SEAMANS. I certainly will."

In addition, the following exchange took place between the Chairman of the Committee and Secretary Seamans:

The CHAIRMAN. Is he still on the Air Force payroll?

Secretary SEAMANS. He is still on the Air Force payroll, he works in the Financial Management Office.

The CHAIRMAN. If I had a fellow like that in my office, he would have been long gone. You don't need to be afraid about firing him."

Secretary Seamans testified at the Commission's hearing that he was not fully satisfied with Mr. Fitzgerald's performance; that he (Fitzgerald) was not taking his responsibilities to the Air Force seriously enough (TR 868-869); that he was not fulfilling his duties (TR 872-874); and that he (Seamans) had stated to the Committee on May 7, 1969 that Mr. Fitzgerald had leaked confidential documents (TR 882). Secretary Seamans testified that on the day after his May 7, 1969 testimony he learned that no security violation was involved (TR 636); that the word "confidential" did leave an ambiguity (TR 637); that some damage was done (TR 637); and that it wasn't until six months later that he apologized to the Committee for his remarks being interpreted as a security violation (TR 617, 637, 892).

Brigadier General Joseph J. Cappucci, former Director of the Air Force Office of Special Investigations (OSI), testified that on May 17, 1969 OSI opened a file, HDQ 24P-12052 and started a special inquiry based on conflict of interest charges made against Mr. Fitzgerald by a confidential informant. Subsequently three (3) more people volunteered information in June and July (TR 48-49). A number of checks were made (TR 61-62) to test the substance of the allegations.

These were in Washington, D.C.; in New York (TR 64); Boston, (TR 70); and in Los Angeles to interview Leonard Marks (TR 83-85). All the checks came back favorable (TR 111, 119) but this favorable information was not placed in the file (TR 111).

General Cappucci testified that when these checks came back favorable, instead of placing the favorable information in the file he closed it and was going to destroy the file when it was impounded (TR 112-113). All the favorable reports were destroyed (TR 115, 120).

We find no creditable explanation for OSI retaining the derogatory allegations about Mr. Fitzgerald while destroying all of the results of the investigation which proved that these allegations were without substance. General Cappucci went to great lengths to try and distinguish between a "Special Inquiry" and an "Investigation". However, it was a fruitless exercise in semantics in this case.

General Cappucci also testified that the June 24, 1969 memorandum report of interview with Leonard Marks (Justice File P-95), which clearly showed that there was no substance to the conflict of interest allegations, was not in the OSI file when he sent it to "The Hill" (TR 157-162). We find it unconscionable for OSI to have shown only the derogatory allegations without also showing the results of the investigation which laid to rest these allegations. We can only view this as an attempt to justify Mr. Fitzgerald's separation.

General Cappucci testified that he was not directed by anyone to open the special inquiry on Mr. Fitzgerald; that he did not disclose the fact that the inquiry was opened or the facts of that inquiry, to Secretary Seamans, Assistant Secretary Nielsen, Assistant Secretary Schedler or anyone else in the Executive Branch of the Government outside the OSI prior to November 4, 1969 (TR 198). General Cappucci also testified that Secretary Seamans first learned of the existence of the OSI file when the General gave the Secretary a few minute briefing on November 17 or 18 [1969], the day before he testified before the Proxmire Committee (TR 154-155).

In his testimony before the Proxmire Committee on November 17, 1969, in discussing the reorganization of the SAFFM Office and Mr. Fitzgerald's resultant RIF, Secretary Seamans stated that he and Mr. Laird the Secretary of Defense made an effort for many months to find a way to use Mr. Fitzgerald in some other capacity; that they talked to him personally; and considered him for other positions in the Department of Defense but did not find a suitable solution (APP-2/9/71, Attachment 1, 102-103).

Secretary Seamans testified that he first gave consideration to finding another job for Fitzgerald outside the Air Force about the middle of May. This was shortly after he learned that the appellant had transmitted documents to Congress and learned the appellant had not fulfilled his commitment to deliver the West Coast address (TR 707-708). Secretary Seamans believed that a job for Mr. Fitzgerald in DOD would be uncluttered by some of the unfortunate relationships that had arisen in the Air Force (TR 708).

Mr. Fitzgerald testified that he met with Secretary of Defense Melvin Laird on June 11, 1969; that the Secretary was very friendly but told the appellant that he had become a personnel problem in the Air Force, which the appellant conceded was probably true; and that he would have to go someplace else. They discussed what might be done in other areas of DOD (TR 2866-2871).

One of the positions under consideration was an assignment on the staff of the Fitzhugh DOD Blue Ribbon Panel (TR 714-723, 2872). Mr. Fitzgerald had meetings with Mr. Fitzhugh and Mr. Buzzard, the Staff Director, and then submitted an August 25, 1969 memo to these men (AF-6/25/70, P-118) which stated in part:

"On the second point, I am not the only action-oriented cost cutter now excluded from the business. Aside from publicity, my situation is unique only in that I have not gone away quietly as have most others of my experience and bent."

After receipt of this memo Mr. Fitzhugh informed Secretary Seamans that he was not going to recommend Mr. Fitzgerald for assignment to the staff (TR 728). Secretary Seamans properly considered the above quoted statement to be a fairly inflammatory kind of statement to put into a memo related to consideration for another position (TR 729-31). The Secretary considered that Mr. Fitzgerald had a chip on his shoulder (TR 729-731). It is clear that Mr. Fitzgerald was not interested in a position on the Fitzhugh Panel as evidenced by the tenor of his August 25, 1969 memo.

Spencer J. Schedler replaced Thomas Nielsen as Assistant Secretary of the Air Force for Financial Management on June 24, 1969. Mr. Schedler testified that he

saw the "Lang Memo" in the summer of 1969. He testified that he considered Mr. Fitzgerald's performance deficient in regard to the instances of the preparation of a "Should Cost Primer" and his failure to have prepared a demonstration guide (TR 1683-1694). Mr. Schedler testified that he first decided to abolish Mr. Fitzgerald's position in late September or early October 1969 when it became evident to him that as a result of the Project 703 cutbacks he would not be able to add spaces to the SAFFM office to improve its analytical capability (TR 1791-1792).

On November 3, 1969 Mr. Schedler submitted a form 52 request to abolish Mr. Fitzgerald's position by reorganization. This request was approved by Secretary Seamans on the same day. Thereafter, by letter dated November 4, 1969, Mr. Fitzgerald was notified of his proposed separation by reduction-in-force which was effected on January 5, 1970.

On November 17 and 18, 1969 the Proxmire Committee held hearings on Mr. Fitzgerald's proposed termination by RIF.

Secretary Seamans testified at the Commission's hearing that between November 4 and 18, 1969 the date of his appearance at the Committee hearing he saw and/or communicated with Republican Senators Jordan and Percy and Republican Congressmen Brown and Conable concerning Mr. Fitzgerald's RIF (TR 777-778, 857-858, 860). The Secretary admitted mentioning to Senator Percy that Mr. Fitzgerald was not a team player (TR 782) and that there had been difficulties in the relationship between Fitzgerald and the Air Force (TR 780). Secretary Seamans also told Senator Jordan of these relationship difficulties; however, he denied that they were the reason for the RIF; and he did not recall using the term "team player."

On May 7, 1973 former Senator Jordan was sent several written interrogatories. His written replies were received May 19, 1973. In answer to one question Mr. Jordan recalled Secretary Seamans stating Mr. Fitzgerald was a troublemaker, that he was not a team player and that he was terminated for economy reasons under a reduction in force designation.

In view of the above and the fact that Secretary Seamans did mention the team player situation to Senator Percy, we must conclude that he also used that term in talking to Senator Jordan.

Assistant Secretary Schedler testified that during the same period of time he visited Republican Senators Mundt and Murphy and Republican Congressmen Broyhill, Buchanan, Conable, Dickinson and Rhodes to explain Mr. Fitzgerald's RIF (TR 1377).

There is a conflict in the evidence as to whether or not Assistant Secretary Schedler told Congressman Dickinson that Mr. Fitzgerald was not a team player. Congressman Dickinson testified (TR 2285) that at their November 11, 1969 meeting Mr. Schedler used the term "not a team player" and the Congressman confirmed the accuracy of a November 19, 1969 newspaper article quoting him as saying that Mr. Schedler told him Mr. Fitzgerald was not a team player (APP-2/9/71, Attachment #1, P 202-203).

Michael L. Lehrman, a former fellow classmate of Mr. Schedler at Harvard testified that he met Mr. Schedler at an Air Force Association Convention in September 1970. Mr. Lehrman testified that at this meeting Mr. Schedler made uncomplimenting remarks about Mr. Fitzgerald, stated that he was "a pain in the ass" and was not a "team player" (TR 2885-2896).

From all of the above we must conclude that Mr. Schedler did tell Congressman Dickinson that Mr. Fitzgerald was not a team player, or used words to that effect.

After carefully reviewing the complete appellate record we find the evidence of record does not support the appellant's allegation that his position was abolished and that he was separated by RIF in retaliation for his having revealed the C-5A cost overrun in testimony before the Proxmire Committee on November 5, 1968.

In summary, the record reflects that the C-5A contract was negotiated during a Democratic Administration. Secretary Seamans and Assistant Secretary Schedler were not in office at the time the contract was negotiated or at the time of Mr. Fitzgerald's testimony, before the Proxmire Committee on November 13, 1968. In fact, Secretary Seamans did not take office until February 1969 and Assistant Secretary Schedler not until June 1969, three (3) and seven (7) months later respectively; and under a Republican Administration.

Secretary Seamans agreed that there was a large cost overrun on the C-5A project and that Mr. Fitzgerald was acting properly in testifying after being

called by the Committee. In addition, a number of witnesses agreed with Mr. Fitzgerald's estimate of the possible magnitude of the overrun.

As we have previously found, and as the Air Force knew, Mr. Fitzgerald was not entitled to career tenure. The Civil Service Commission had not been requested nor had it granted prior approval to the Air Force to convert Mr. Fitzgerald from the Excepted to the Competitive Service. The September 6, 1969 SF-50 was erroneously issued, obviously due to a computer error, and was properly corrected by the November 25, 1968 SF-50 to show that Mr. Fitzgerald was converted from "Excepted-Conditional to "Excepted" upon completion of three years of service, effective September 20, 1968.

The Lang Memo of January 6, 1969 and Assistant Secretary Nielsen's January 8, 1969 comment to Mr. Fitzgerald, which Mr. Nielsen made the subject of a memo for record on January 13, 1969, that his usefulness of the Air Force had come to an end did not stem from his testimony before Congress on November 13, 1968. The two pronouncements resulted directly from the January 1, 1969 Washington Post front-page story that carried a clear but erroneous implication that Mr. Fitzgerald's career tenure had been revoked in retaliation for his November 13, 1968 testimony. Secretary Seamans, and others in the Air Force considered Mr. Fitzgerald to be a publicity seeker; that the appellant was directly or indirectly responsible for the erroneous January 1, 1969 Washington Post story; and that Mr. Fitzgerald had done this for the purpose of placing the Air Force in a bad light.

We find that the unjust publicity the Air Force received concerning this tenure controversy, which it considered Mr. Fitzgerald to be basically responsible for, was the prime factor in the deterioration of relationships and development of an adversary environment between Mr. Fitzgerald and the Air Force.

We note that Mr. Fitzgerald received his appointment in September 1965 during a Democratic Administration, and in his own words the appointment was to be for only a few years. Mr. Fitzgerald's position carried with it the qualifications requirement that he "be personally acceptable to the Assistant Secretary of the Air Force (Financial Management (A-6/25/70, P-145). By the end of December 1968 the appellant's "few years" had gone by; a Republican Administration would soon be coming into office; and thus it appeared that Mr. Fitzgerald could possibly soon be leaving.

While Mr. Fitzgerald has denied that he was "Senator Proxmire's boy in the Air Force", and he may honestly believe it, we find this statement difficult to accept. It is evident that the top officials in the Air Force, without specifically saying so, considered him to be just that. The statements that he was not a "team player" and "not on the Air Force team" go directly to that point. We also note that upon leaving the Air Force Mr. Fitzgerald was employed as a consultant by the Proxmire Committee and that Senator Proxmire appeared at the Commission hearing as a character witness for the appellant.

It is also clear that probably by January 1969, and certainly no later than May 1969, Mr. Fitzgerald had achieved controversial status and was an Air Force personnel problem as his testimony concerning his meeting with Secretary of Defense Melvin Laird revealed.

Assistant Secretary Nielsen considered Mr. Fitzgerald's usefulness to the Air Force to be at an end as of January 8, 1969. Therefore, he obviously did not include Mr. Fitzgerald in his proposed reorganizations of February 26, 1969 and May 5, 1969. Mr. Nielsen's last proposal is essentially the same as the reorganization Assistant Secretary Schedler, with Secretary Seaman's approval, finally put into effect. This reorganization abolished Mr. Fitzgerald's position and led to his separation by RIF on January 5, 1970.

Mr. Schedler testified that he did not decide to abolish Mr. Fitzgerald's position until late September or early October 1969. However, Secretary Seamans and Secretary Laird came to the decision that Mr. Fitzgerald had to leave the Air Force much earlier than Mr. Schedler was willing to admit. They were busy looking for another position outside the Air Force for the appellant as early as May 1969. One of the positions under consideration was with the Fitzhugh Blue Ribbon Panel, previously discussed.

Secretary Seamans denied being instructed, directed or ordered by anyone to terminate Mr. Fitzgerald. However, he initially declined to respond to any and all questions concerning possible communications he may have had with, or any advice received from, the White House staff regarding Mr. Fitzgerald. This declination was based on the doctrines of Executive Privilege and privileged communications. Secretary Seamans was advised by this examiner (TR 499) as follows:

"Mr. Secretary, I am without authority to order you to answer the question. If the answer to the question becomes relevant and material, all I can do is to take into consideration your refusal to answer the question."

Secretary Seamans subsequently testified that at some point in time prior to Mr. Fitzgerald's job being abolished he did receive some advice from the White House; however, he refused to discuss it any further (TR 839).

By letter dated August 2, 1973, with a copy to the agency representative, appellant's attorney submitted a copy of a January 20, 1970 internal White House memo from Alexander Butterfield to Mr. H. R. Haideman that had just been discovered. The agency was offered but declined the opportunity to comment. This memo states:

"You'll recall that I relayed to you my personal comments while you were at San Clemente, but let me cite them once again—partly for the record—and partly because some of you with more political horse sense than I will probably want to review the matter prior to next Monday's press conference.

"Fitzgerald is no doubt a top-notch cost expert, but he must be given very low marks in loyalty; and after all, loyalty is the name of the game.

"Last May he slipped off alone to a meeting of the National Democratic Coalition and while there revealed to a senior AFL-CIO official (who happened to be unsympathetic) that he planned to "blow the whistle on the Air Force" by exposing to full public view that Service's "shoddy purchasing practices." Only a basic no-goodnik would take his official business grievances so far from normal channels. As imperfect as the Air Force and other military Services are, they very definitely do not go out of their way to waste government funds; in fact, quite to the contrary, they strive continuously (at least in spirit) to find new ways to economize. If McNamara did nothing else he made the Services more cost-conscious and introspective—so I think it is safe to say that none of their bungling is malicious . . . or even preconceived.

"Upon leaving the Pentagon—on his last official duty—he announced to the press that 'contrary to recent newspaper reports' he was not going to work for the Federal Government, but instead, was going to 'work on the outside' as a private consultant.

"We should let him bleed, for a while at least. Any rush to pick him up and put him back on the Federal payroll would be tantamount to an admission of earlier wrong-doing on our part.

"We owe 'first choice on Fitzgerald' to Proxmire and others who tried so hard to make him a hero."

The information contained in the memo concerning Mr. Fitzgerald's May 1969 statements at a meeting of the National Democratic Coalition had not previously come to light in this proceeding. In the light of Secretary Seaman's refusal to furnish testimony on conversations he had with, or advice he received from the White House Staff; and our notification to the Secretary (TR 499), quoted supra, we must conclude and do hereby find that Mr. Fitzgerald's May 1969 statements were the subject of Secretary Seaman's discussion with the White House staff. We must also conclude and do hereby find that these statements by Mr. Fitzgerald were one of the underlying reasons for the decision to abolish Mr. Fitzgerald's position and to terminate his employment with the Air Force.

The "Lang Memo" previously quoted, set out three (3) methods by which the agency could terminate Mr. Fitzgerald. Method No. 3, was not recommended. Method No. 1, was to follow adverse action procedures with all of the requirements for specified charges, opportunity to reply and appeals. Method No. 2, which the agency subsequently followed, was to abolish Mr. Fitzgerald's position and since his assignment rights would only be to Excepted Service positions, he would end up being separated. Secretary Seamans and Assistant Secretary Schedler both saw the "Lang Memo" prior to Mr. Fitzgerald's position being abolished.

Our findings, supra, reveal many instances of dissatisfaction with Mr. Fitzgerald. In addition, Secretary Seamans testified (TR 964) that:

"It is obvious from the testimony these past three days that I was not satisfied with Mr. Fitzgerald's performance. I made no pretense that I was."

After carefully reviewing the complete appellate record and in view of all of the foregoing analysis, findings and conclusions, we find that the agency's decision to abolish Mr. Fitzgerald's position and to include him in the Project 703 reduction-in-force improperly resulted from and was influenced by reasons purely personal to the appellant; and was for the purpose of terminating his employment with the Air Force.

Secretary Seamans, in discussing his dissatisfaction with Mr. Fitzgerald also stated (TR 964) :

"But at the same time it does not give Mr. Fitzgerald immunity against having his job abolished, and the abolition of the job for improvement in our management capability was a separate and distinct step, or action."

It is true that an undesirable, inadequate or unsatisfactory employee is not immune from having his position abolished. However, the decision to abolish that employee's, or any employee's, position must be based solely on reasons not personal to the employee. These employees must be removed from their positions by other means because the spirit, intent, and letter of the Commission's regulations require that the reduction-in-force system be used for reasons that are not personal to the employees affected. The more an employee is deserving of being fired, the more inappropriate it is to abolish his position and separate him by reduction-in-force.

In the case at hand, where we have found from the evidence of record that the decision to abolish Mr. Fitzgerald's position and to separate him by reduction-in-force was influenced by, and resulted from, reasons that were personal to the appellant; and where the appellant was an employee entitled to the adverse action procedures set forth in Part 752-B of the Civil Service regulations; we find his separation by reduction-in-force to be improper, inappropriate and contrary to the spirit, intent, and letter of the Commission's regulations.

#### RECOMMENDATION

Accordingly, we recommend that Mr. Fitzgerald be restored retroactively to January 5, 1970 to the position from which he was improperly separated, or to any other position of like grade, salary and tenure in the Excepted Service and with the same or similar qualifications requirements as his former position. Please furnish this office with a copy of the SF-50 accomplishing the recommended corrective action.

The appellant requested an award of damages, costs and reasonable attorneys' fees. The applicable statutes, Executive Orders and Commission regulations do not provide for any awards of damages, costs, or attorneys' fees by the Commission in a decision on an appeal. Therefore, the appellant's request in this regard must be denied. It should be noted that during the course of the proceeding the appellant's attorneys contended that they had volunteered their services and were performing without charge.

The appellant has also requested reimbursement for the compensation he would have received if he had not been terminated.

Retroactive corrective action as ordered by the Commission carries with it an entitlement to back pay in accordance with the provisions of the "Back Pay Act." However, the Commission does not determine the amount of the back pay entitlement, if any.

Unless this decision is further appealed within 15 calendar days of the day on which it is received, it becomes the final decision of the U.S. Civil Service Commission. Any further appeal of this decision must be sent directly to:

Board of Appeals and Review  
U.S. Civil Service Commission  
Washington, D.C. 20415

Two copies of the letter of further appeal and all representations which the Board should consider beyond those now in the appeal file must be submitted within the 15 calendar day time limitation.

HERMAN D. STAIMAN,  
*Chief, Appeals Examining Office.*

Chairman PROXMIRE. While we are on the subject, I notice that you say in your prepared statement that others who have tried to cut procurement costs have been driven out or neutralized. Can you elaborate on that?

#### SHOULD-COST EXPERTS STIFLED BY THE DEFENSE DEPARTMENT

Mr. FITZGERALD. I was referring there specifically and particularly, Mr. Chairman, to people who had been heavily involved in the kind of

analysis that I described in the old-fashioned approach to should cost, the hard nosed quantification of fat. To me this is almost like eating the apple in the Garden of Eden. It is sort of the forbidden fruit of knowledge. It seems that you just cannot survive pressing these sorts of facts and figures on reluctant bureaucracies. And that is what happened. I think at this point there are none of the really experienced professional people who worked with me on these in-depth analyses in the past left active in the business. If they are still in the military contracting community, they have been neutralized. Nobody is doing the kind of thing I have described here, to my knowledge, there may be some people at lower levels in the services who still try to do this sort of thing.

Chairman PROXMIRE. And the way that that has worked is that they have simply been discouraged, and as a result have left the service?

Mr. FITZGERALD. Some have been fired, and some have even been blackballed from further employment.

Chairman PROXMIRE. That is what we want the documentation on.

Mr. FITZGERALD. I do not know that we can document the blackballing, it is just the—

Chairman PROXMIRE. You can give us the names and actual programs for the record.

Mr. FITZGERALD. Yes, sir, if I might consult with some of the individuals as to whether they think it would do them harm.

Chairman PROXMIRE. I think that is a good idea.

DEFENSE DEPARTMENT DESTROYS THE LIVES OF THOSE WHO TRY TO REDUCE  
WEAPONS SYSTEMS COSTS

Mr. FITZGERALD. Many of them are trying to rebuild their lives. But the fact is that is what they were forced to do. There seems to be a very harsh view of people who create or develop or present these very embarrassing facts. And they are embarrassing, you have got to admit that. When you come up with things like Mr. Yuspeh has shown, with 80 percent fat, or 3-percent efficiency levels, or levels of efficiency that would mean that a television set would cost \$8,000, there is no way that the incumbent in the procurement position can look good. One of the reasons for inaction given privately is that if we really improve to the degree that is possible, someone would ask what we have been doing before. You have tremendous bureaucratic inertia there. And there is no countervailing force that seems to be effective in protecting folks doing this sort of thing.

Chairman PROXMIRE. I have always thought it would be very nice for the administration, any administration—after all, your problems arose under a Democratic administration to begin with, when you testified a Democratic administration was in authority.

Mr. FITZGERALD. Very definitely.

Chairman PROXMIRE. And you were given bad treatment there. And I think it would be logical politicalwise and in the national interest to restore you.

Let me get on to something else.

Mr. Yuspeh, your charts and presentation have been most impressive and startling. I am shocked and surprised. We had a notion of this difference—I have not been able to document it, but we have had fine testimony from Admiral Rickover to the effect that there is this differ-

ence between competitive and negotiated sole source procurement. But you have specifics, particularly procurement, companies, amounts, percentages. And I think this is a fine documentation.

But can you tell us whether they are typical in the sense that the services use this technique often and try to get as much competition as possible, or are they atypical in the sense that this technique is used infrequently?

#### COMPETITION IS RARE IN THE DEFENSE DEPARTMENT

Mr. YUSPEH. I would have to say that they would definitely be atypical.

Chairman PROXMIRE. It is atypical that they would use the technique of competition.

Mr. YUSPEH. Right. To support my view, I will review the process that I went through in order to come up with the 20 cases that appear in the study. I reviewed an extensive data base that was provided for me by the Navy. And there were at least 5,000 different contract buys in that data base. From those, nothing could really be determined because as it turns out, the military does not specifically identify each system. In other words, there is no data base which, if you wanted to know how a standard missile is procured that could tell you what you wanted to know. The nomenclature is never broken down into such a simple term. It was a narrowing process. And finally, my best success resulted from just talking to different, experienced procurement officers at the Defense Department, and asking them whether they could recall any of these systems. As it turned out, they were able to recall these that appear here. And that was after long thinking.

Chairman PROXMIRE. So these are most unusual? It is rare—

Mr. YUSPEH. It is very rare, especially for systems with the unit price limit I placed on them. In other words, I did not include any system that cost less than a thousand dollars.

Chairman PROXMIRE. Why do you think it is so rare, and what can we do about it to make it more common? It would be a great service to the taxpayer, and also as a check on the efficiency of the contractors.

#### HOW TO MAKE COMPETITION MORE COMMON

Mr. YUSPEH. To start with the second part of your question, Congress can make it more common, if it would implement what I suggested in my opening statement. Congress could force the Defense Department to fill out a form, answer some questions that would indicate whether it was in fact negotiating something when it should be competing it. Congress should not allow DOD to negotiate unless DOD can prove that this is the only way the item can be procured.

Chairman PROXMIRE. That should be easy to do, because we have in the law the requirement that the competitive bidding be the source unless there are reasons to justify following another course, such as the sole source procurement.

Mr. YUSPEH. Right. It appears, though, that the Defense Department has been rather successful in convincing people that a missile or some complex electronics—is so difficult to build that maybe only one or two companies exist that are capable of building it; and DOD intends to go only to them and have them build it. Also, there is an

idea that has been brought up today that DOD wants the best system that it can get its hands on. Often there is a fight between the project manager, who gets his brownie points by making sure that DOD has a good system, that logistics are set up correctly, and that the system is procured on time. And then there is the contract negotiator, or contracting officer, who gets brownie points by reducing costs to the best of his ability.

Chairman PROXMIRE. I do not think we can ever win or should ever win on the ground that we are deteriorating the quality or the performance. We have to have a high performance. But I do not think you are saying that this is inconsistent with low cost, are you?

Mr. YUSPEH. No. As a matter of fact, one question that I did ask in each case was, "did quality dissipate in any way for the competitive item that was received—was anything wrong with it?" And as it turned out, the quality was identical. In some cases—I would not say it was necessarily better, but it was at least as good and never worse than the sole source producer's piece of equipment. There seems to be no problem of quality control in just knocking the fat out of the contract price.

Chairman PROXMIRE. One of the most intriguing aspects of your analysis is the fact that huge price reductions can be attained through competition in cases involving highly advanced technology. How far into weapons procurement does this potential extend? Would it work as well with tanks, airplanes, the larger missiles and ships?

#### COMPETE SUBCONTRACTS

Mr. YUSPEH. I think for something, let us say, like a B-1 bomber, it would work. It has been stated here yesterday and again today that at least 50 percent of most contracts are subcontracted out. I think if the Defense Department, with pressure from Congress, was forced to make sure that those subcontracts, which are considerably smaller than the contracts for the whole system, were competed; then the total price on the larger system, which the prime contractor assembles from parts manufactured by the subs, would be considerably less. So I think the price reducing impact for extremely complex systems like a jet fighter, bomber, or ship would be realized if Congress enforced strict competitive subcontracting.

Chairman PROXMIRE. Will you comment, Mr. Fitzgerald?

Mr. FITZGERALD. I think, as I have alluded to very briefly, that there is also the possibility of having competition for the tenancy of these plants where the monumental assembly jigs and so on are located. I would hesitate to say that we ought to propose that people compete and have to reconstruct all that material. I think that the main problem is the inability of the huge systems contractors to be competitive. I think that they are so enormously fat that most of them would have great difficulty in staying in business. I do not think there is any question of the desirability of competitive subcontracting, Mr. Chairman.

When I was first indoctrinated into the Pentagon I had given to me a document which I dug out last night by the Rand Corp.—it is a 1965 document, but I do not know that anything has changed—having to do with this relationship between the favored giants and

the services. Rand states that the contractual relationship is only one part of the overall relationship of a giant firm with the services. These giant firms are viewed as extensions of the service, especially in the Air Force.

Chairman PROXMIRE. Do you see a contradiction in Mr. Yuspeh's finding that these are the giants that competed, General Dynamics, Bendix, and so forth, these were generally very, very large concerns?

Mr. FITZGERALD. I do not consider Bendix a giant. The General Dynamics Division shown was the Pomona Division, which was at the time a Navy-owned missile plant. And there was active talk, which illustrates my point further, of having a competitive contract let for the occupancy of that plant during the standard missile development program. The Pomona plant, in my estimation, is a far more efficient operation than, let us say, the General Dynamics Fort Worth, where the F-111 fighter bomber was built. I am speaking here of the systems operations divisions, the systems management divisions, of these firms.

DEFENSE CONTRACTOR'S PRICES ARE HIGH AND PROFITS ARE LOW—WHY?

Chairman PROXMIRE. You are getting at something which bothers a lot of us. And one reason that we cannot make more progress is that when we argue that there is so much fat on the part of the contractors, they say, "look at our return on investment. If we are making so much money, why are not our profits higher?" And they point out that some of them are not doing well, and some are really in financial trouble. You say this is because they are just grossly inefficient?

Mr. FITZGERALD. I think that is part of it. I am not sure that the business is all that unattractive when you consider the amount of real investment that many of them have in the plant. If you are occupying a Government plant nearly or in some cases almost completely rent free, if you have Government-furnished operating capital, if you are practically speaking, protected from catastrophic losses, if you are not allowed to go broke, any money that you make—

Chairman PROXMIRE. These are all arguments along the lines I have made. why are these firms not making a lot of money? Why is Lockheed in such desperate shape? The Marietta plant is supplied by the Government. And they have all sorts of advantages that way. If they are getting such lush soft contracts, why are they not more profitable?

Mr. FITZGERALD. I think Lockheed's basic problems are mistakes in timing and other mistakes connected with their commercial program. Of course, I do not think that we can deny that Lockheed probably suffered a little more at the hands of the Government as a result of disclosure of their problems early on than they would have otherwise. I do not think there is any way that Lockheed would have been made to take even a theoretical paper loss on that contract had it not been made public. I have no reason to believe that Rockwell, for example, will lose money on the B-1 bomber. They are having huge cost overruns, or cost increases, in that program. I do not know whether prices are adjusted to cover them or not. But I do not know any place else where you can get risk-free business, Mr. Chairman, of that magnitude. Another consideration, it is very important for large corporations that

have mixed business, military and civilian, to have overhead absorption. Very often the overhead that is absorbed by these huge direct cost bases for the military is worth real cash in terms of reducing the apparent cost in their civilian work.

Chairman PROXMIER. I know you want to comment on this, Professor Art.

You seem to be saying that the large firms have less competence in the area of weapons development than they do in weapons production, that they are more interested in the production phase and they therefore underbid or buy into development contracts in order to get the follow-on production work. You suggest that the Government do more inhouse development and view the large firms as assemblers and producers. Yet, the Pentagon spends about \$8 billion annually on R. & D., most of which goes to private contractors and another \$700 million on independent R. & D., which also goes to private firms. In addition, NASA and AEC also spend large amounts for R. & D. in the private sector. Do you think it is feasible to reverse these trends, and how much institutional resistance to any significant shift in the way Government R. & D. funds are spent would you expect to encounter?

NEED FOR RESTRUCTURING WEAPONS SYSTEMS DEVELOPMENT IN THE  
DEFENSE DEPARTMENT

Mr. ART. I am not sure I can answer all of the questions and if I don't, please remind me.

What is clear to me is—and I think historical perspective here is important—what we have done, I think, essentially is to have moved away from the past Navy system to the Air Force system for contracting. The Navy used to have a lot of inhouse design capability in which the designs for new systems would be prepared by the Navy, as I understand it—and I have not looked into this area in a lot of detail. These designs were quite good. The Navy would serve almost as its own weapons systems manager and delegate out to various firms subcomponent developments. The Air Force never adopted this pattern. Instead they delegated both design and system management to private industry. That spelled the end of service system integration.

I would make the reverse point about the big firms. I think that, in fact, they have developed the kind of capability that they were asked to develop by the Air Force, which is, in fact, to be able to provide unbelievably large increments in the state of the art, and do it on a large number of subcomponents simultaneously. There have been some studies done showing the amount of difference in the size of technical staff in these big firms compared to some European companies. I believe the study was done by Perry of the Rand Corp. out in Santa Monica. And the difference is unbelievable. It is four or five to one. Historically what has happened is that the Air Force has moved away from design specification to performance specification. And they have delegated not only the design but also simultaneous subsystem interfacing to these large defense firms. And so now have an institutional arrangement that has clearly resulted from what in fact the services have asked for. These big firms are quite competent in concurrent advances in the state of the art. That is precisely the problems.

It seems to me that if that, in fact, is the situation, you have tremendous ongoing pressures by the defense contractors to goldplate and to do so quickly.

#### MOVE TO SUBCOMPONENT DEVELOPMENT

The solutions are more difficult to prescribe than the problem. But at least the problems dictate what we should move away from, if not what we should move toward. And I think what we should move away from is asking companies like Lockheed to do simultaneous development of many systems. If in fact the thrust of Mr. Yuspeh's testimony is that we can get real reduction in costs, forget about the learning curves for a moment, but real reduction in unit costs via competitive negotiation on subcomponents, then I think there is a very clear implication here that we should move toward subcomponent development, and do it in either one of two ways.

Either do it before—and develop a ground terrain-covering radar or a missile system, and then say, here, Lockheed, or here, whoever, you have got this missile system, now put it into an airplane that will do this, rather than asking Lockheed to subcontract a missile system at the same time it is advancing the state of the art in airplane technology; or move toward competitive negotiation the way Mr. Yuspeh prescribed.

In other words, one good way to get competition is to move toward subcomponent development.

Chairman PROXMIRE. I have got to go to a vote. I will be right back. The subcommittee will stand in recess for 7 or 8 minutes.

[A short recess was taken.]

#### WHICH LABS MORE EFFICIENT—PRIVATE OR PUBLIC SECTOR?

Chairman PROXMIRE. The subcommittee will come to order.

Mr. Art, regarding any increased use of Government laboratories and other facilities for R. & D., I would anticipate an argument that Government labs—like the old arsenals—are inherently inefficient and that the private sector does a better job.

What is your response?

Mr. ART. I heard both arguments—that Government arsenals have been inefficient, and they are also more efficient. I think there is one good way to answer the question, which is begin to do some experimentation and perhaps Congress can prescribe experimentation, more use of in-house labs to compare results. I think that the record in the past, as I understand, is in fact a mixed one. But there are some good results in the past without getting into specifics, because I am not aware of the specific, but there is a good test, which is to try it and see what happens.

Chairman PROXMIRE. Mr. Fitzgerald, yesterday we heard testimony from GAO on the should-cost approach.

Can you give us your appraisal of what the services have done in this area and whether there seems to be a sincere effort in the Pentagon to identify and eliminate procurement waste? Elaborate on what you told us. As I understood your testimony before us, the should-cost has become far vaguer and broader and less useful, it doesn't have the bite and force that it used to have.

## SHOULD-COST STUDIES—EFFECTIVENESS AND SCOPE

Mr. FITZGERALD. I think there is no question, Mr. Chairman, that there has been some excellent work done.

As you know, I am a great admirer of Gordon Rule. And I think his landmark study on the TF-30, on the engine for the F-111 was good. Unfortunately, since that good work, all the money has been given back to the contractor, many times over the savings. I suspect the same thing has happened on the Hawk missile, the improved Hawk, which the Army testified about before this subcommittee a couple of years ago and bragged about.

I was pleased to see it then. I thought it represented real progress. But based on what little information we can get, total contract prices and so on, it appears that the same thing might have happened there; that is, that they have given the money back. There have been tremendous pressures in every service to convert the hardnosed quantitative should-cost approach to a vaguer thing much like what we used to call in the Air Force, "IMAS" or Industrial Management Assistance Survey. It was not a useless thing at all. Teams went in and reviewed contractor systems and said, you ought to improve in production control, you ought to do better in purchasing and so on. But it did not quantify fat in the systematic way I described here. And that is what has gone by the board. The teams are getting to be huge cumbersome groups, and they spend weeks or months in the plant. And yet, we still have the Comptroller General saying, "You can't quantify."

Just by way of example, I have a should-cost study that I did, I and two of my associates, on the Standard missile. It was done in 1964, and cost \$8,000. We now have spent a million dollars, you know, on some of these things. And this was a successful thing. The client, the Navy, was able to save a lot of money with it. As a matter of fact, the should-cost was \$25,000 per missile—

## SHOULD-COST QUANTIFIES THE FAT

Chairman PROXMIRE. Maybe we should get a response to this, because this seems like a very logical criticism. You say the should-cost study itself should cost less?

Mr. FITZGERALD. Yes, sir.

Chairman PROXMIRE. That should be simpler.

Mr. FITZGERALD. Yes, sir.

Chairman PROXMIRE. It should be designed to indicate what a particular procurement should cost.

Mr. FITZGERALD. Exactly. Quantify the fat, should be the purpose of it.

Chairman PROXMIRE. I am going to ask the services to give us response to this as well as the GAO.

As you mentioned in your prepared statement, the subcommittee requested and obtained a review of the Army Materiel Command should-cost program. Can you explain who prepared this document, and why the review was conducted?

Mr. FITZGERALD. As I understand it, it was a contract that the Army had let with Performance Technology Corp., primarily Merton Tyr-

rell, who is the president and almost sole survivor in the company, to review the progress that had been made on the should-cost program, which included some things that Mr. Tyrrel himself had helped with, but many that he had not, as I understood the report.

This report also documented some of the problems that were developing, the pressures that were developing, to make should-cost more palatable to the large contractors and the bureaucracy, and in effect predicted what is happening.

Chairman PROXMIRE. What were the major findings of the review?

Mr. FITZGERALD. I thought the guts of the report, the findings, were contained in the table in my prepared statement. This is the dollars per standard labor-hour index. Also from an appraisal point of view, the health of the program was assessed as having a very poor outlook, and was not likely to survive the pressures from the giants of industry and the bureaucracy.

Should-cost does not help the contractors in the short run. I think it is an excellent thing for them in the long run, if they take it to heart and shape up. But in the short run it costs them money in most cases. And, it is very embarrassing to the established entrenched bureaucracy.

Chairman PROXMIRE. We were told yesterday that it is not only embarrassing, but it is difficult if not impossible to quantify levels of efficiency or inefficiency in defense production.

Mr. FITZGERALD. It is difficult, but not nearly impossible. As a matter of fact, it is straightforward cost accounting with a little bit of industrial engineering thrown in.

If you can get a lot of industrial engineering, so much the better. You can spend any amount of time on a study, of course. I have found that in many of the large contractor plants, and practically all of the small one, that measurements are available which facilitate this. In these cases it is not hard to do at all.

Chairman PROXMIRE. Let's go back to the table a minute.

How is it possible to have such wide disparity in the amount of cost for direct labor?

Could it be that some types of work such as electronics and missile production are simply more complex and different than others, and the figures reflect this, or are you saying that labor and management and Raytheon and Sanders are incompetent or lazy?

Mr. FITZGERALD. No, I don't know that much about Raytheon and Sanders specifically. But on the face of it, it appears that there are some rather large inefficiencies. I think that there is no question that there are differences in the nature of the business between, let us say, missiles manufacturing, automotive, airframe, and electronics. However, if the work measurement indices, the time standards, are properly established, they reflect the work content of each job. In other words, if there are differences in the job that will change the work content—

Chairman PROXMIRE. Where there is a difference, once you have allowed for the difference in the technique, or the difference in the skill, or whatever, what then do you conclude is the reason for the difference?

Mr. FITZGERALD. Without having the information that the subcommittee has been trying to get—

Chairman PROXMIRE. What are some of the possibilities?

## LOW LABOR EFFICIENCY IN DEFENSE PRODUCTION

Mr. FITZGERALD. We almost invariably find low labor efficiency in the factory. But poor as it is, it is often better than the white collar and management areas, and the very low efficiencies in these areas are reflected in the enormous overhead expenses, which have grown very rapidly since 1961.

Chairman PROXMIRE. We are talking about the labor.

Mr. FITZGERALD. Just labor.

Chairman PROXMIRE. Is the labor not trained properly? Is it not used fully, is there idle time?

Mr. FITZGERALD. All of those. One of the most basic things that I have found missing in my own experience is the systematic assignment of work and followup by supervision. In some cases people simply are not asked to do a day's work. And if you do not ask them, there is very little possibility of getting it. And, of course, Mr. Chairman, I am sure it is easy to see that if you deliberately overstaff the factory, and there is a limited amount of work that can be done, all the time of the over-staffed factory will be charged one way or another to whatever hardware moves through it. There is not much the labor force itself can do about it. The balancing of work force and workload is the job of management. That is the starting point of getting efficiency.

\$300 CALCULATOR FOR \$6,000; \$100 TAPE RECORDER FOR \$2,000—  
INEFFICIENCY IN DEFENSE PRODUCTION

Chairman PROXMIRE. We have some electronic items in congressional offices, such as desk calculators and tape recorders. Are you saying that these items would cost 20 times their current price if they were produced with the same level of efficiency as in the Sanders case? In other words, that a \$300 calculator would cost \$6,000 and a \$100 tape recorder would cost \$2,000?

Mr. FITZGERALD. If they could get someone to pay the bill, that is what they could cost. I would think that if they should try to go into such a business they would have to make a dramatic revision to their method of operating. Many companies try to isolate commercial activity from their military activities geographically. They do not want one to infect the other. And they definitely do, there is no question about that. You cannot have workers on one side of a factory working at a 10- or 15- or 40-percent pace, and people on the other side working at a 100 or 120 percent of normal, you just cannot get them to do that. And, unhappily, the infection always goes from the poor to the efficient.

Chairman PROXMIRE. You sound as if there was an actual slowdown here, rather than some kind of a failure in technique. Have you actually seen that?

Mr. FITZGERALD. Sure. And the kind of studies that are being done—that were being done under the old version, the should-cost—will detect this. Sure, that will be readily apparent, as it is in Pratt and Whitney study on the TF-30.

Chairman PROXMIRE. What is the motivation here? Is it the idea of providing more work by just doing a job more slowly?

Mr. FITZGERALD. That is part of it.

DEFENSE CONTRACTORS RESPOND TO CUSTOMER'S DEMAND—DOD  
GETS WHAT IT WANTS

Chairman PROXMIRE. Why should they do it competently and rapidly?

Mr. FITZGERALD. I would turn it around and ask, why should they not do exactly what they are doing? There is no incentive to do other than what they are doing. As Mr. Art suggested, they are doing what their customers demand, otherwise they would not be in business. There are many reasons given for this, when you pin folks down.

Chairman PROXMIRE. You and I know that the Pentagon people are patriotic.

Mr. FITZGERALD. Yes.

Chairman PROXMIRE. I think they are embarrassed by high costs too, they must be. And we certainly criticize them, and they are criticized by the Office of Management and Budget. And they get some recognition for bringing these weapons systems in at a reasonable cost. And they get a lot of criticism if they do not.

Mr. FITZGERALD. I remember asking a general friend of mine—and I did have some general friends and still do, as a matter of fact—about criticisms from Congress once, while I was in the Pentagon, that had to do with the Southeast Asia war. And I asked, "How do you react to that?"

He said, "I do not pay any attention to it."

I asked, "Why not?" And he said, "They are not serious." And I asked, "How can you tell?" And he said, "When they are serious they will let us know. They will cut off the money."

And that is the way they judge those things. They are pretty tough. They are accustomed to bad news, Senator.

Chairman PROXMIRE. Yes; but most of these contractors—Lockheed is overwhelmingly a defense contractor—however, as you say, do both. And the overwhelming majority do. Now, you would think this would be a matter of habit, a matter of pride, and also a matter of patriotism for them to do the best job they could do. I cannot believe that there would be a conspiracy to do things inefficiently.

INEFFICIENCY REWARDED BY THE DEFENSE DEPARTMENT

Mr. FITZGERALD. I think that what we have here is a combination of many factors. In the first place, in a sole-source operation where the contractor knows he is going to get the business year after year, he recognizes very well that with the Defense Department's cost-based pricing, that he is going to cut his own throat if he cuts his cost base. It will cut his profit, there is no question about that. He might make more money on the instant contract, but the way the business is done in the Pentagon, the lower price will be extended and he will get a percent of the lower base in profit.

Chairman PROXMIRE. Now we are getting somewhere. There is that built-in incentive, if he does a good job and holds his costs down, then he is going to be held to that tighter standard in the future.

Mr. FITZGERALD. That is right.

Chairman PROXMIRE. And the result is that he is likely to have lesser profits, and there is going to be more pressure on him to secure greater and greater efficiency.

Mr. FITZGERALD. I think, as much as I appreciate the Renegotiation Board, that is a factor as well. I do not know how real a factor it is, but it is cast up as an obstacle to too great an improvement. You often have people tell you that if they make too much profit, some of it will be taken away. I have not seen so much of that myself.

Chairman PROXMIRE. We had the Renegotiation Board people up, and they admitted that after renegotiation some firms were making a thousand percent return in some places.

DEFENSE CONTRACTORS THREATEN UNEMPLOYMENT IF CONTRACT CUTS  
SUGGESTED

Mr. FITZGERALD. That is right. But I think that is more of an imagined obstacle than real. Now, there is another real business type consideration for the giant. I have seen you on the other side of arguments in which the principal pitch of the proponents of some system or another was that it makes jobs, that if you do not give us this money, there are going to be  $x$  people thrown out of work. Now, the larger that  $x$  is, the more persuasive the argument. If someone can come in and say, if you do not vote "yes" on this proposition, we are going to throw 40,000 people or 70,000 or 100,000 out of work, then they usually prevail. If, on the other hand, they say 300 people will lose their jobs, nobody pays any attention. I think it is very well understood by the giant systems contractors that they are holding hostage these droves of people, the necessary workers plus the supernumeraries, holding them hostage to their future business. And many of them look at it this way, that they have almost a God given right to maintain an employment level of 70,000 or 100,000, or whatever they happen to have. I do not know if Professor Art has —

Chairman PROXMIRE. Mr. Art has been chomping at the bit here. But I wanted to finish the line of questioning with you first.

But go ahead, Mr. Art.

Mr. ART. It is in the line of questioning. It is always hard to deal with particulars. But I think Mr. Fitzgerald has hit on a simple problem; and that is, in the Defense Department profits are figured as a percentage of cost. That is why I said in my oral arguments and in my prepared statement that one should not look at the size of the profit to understand what goes on in the defense industry, but rather the manner in which they are figured. When profits are figured as a percentage of cost, the contractor will be penalized not only in the present but in the future for being efficient.

One thing is certain—there is a disincentive for making capital investment. Capital investment in the past has not been considered an allowable cost. So it should not surprise us that contractors in the past did not make capital investments.

Chairman PROXMIRE. We have been trying to emphasize here that profits should be on the basis of return on investment rather than on sales.

Mr. ART. That is right.

But there is another problem at work here. Many of these defense contractors, as we know very well, do commercial work. And since profits are figured as a percentage of costs, I think there is tremendous overhead padding on the part of defense firms.

They pad some of their nondefense work through Government overhead costs.

And I think there are three ways to deal with this. One is to get more competition.

Another is parametric costing. And the third is "should-cost" studies.

Chairman PROXMIRE. We have the Cost Accounting Standard Board to try to eliminate this padding. And, of course, the should-cost is another technique that we have been trying to press and make it as hard and tough and effective as we can. And your testimony this morning—especially Mr. Fitzgerald's testimony—has been very, very helpful on that line.

Go ahead.

#### ONLY COMPETITION IS A POSSIBLE ALTERNATIVE TO SHOULD-COST

Mr. ART. All I want to do is reinforce the point that Mr. Fitzgerald made. I see no alternative to should-cost techniques other than competition. Should cost techniques, I think, are absolutely essential, because the problem of parametric costing, as I understand it, is that you are doing statistical studies on a data base which incorporate all the inefficiencies of the past. And the point of should-cost techniques is to, in fact, look at particular plants to figure out what the systems should cost. I see no reason in the abstract why should-cost techniques cannot be implemented and vigorously implemented. And you really do have a two track approach here.

Chairman PROXMIRE. One way of getting away from the invidious effects of your parametric costs, as you put it, that is, historical costs, is to have a should cost approach, because if you build it up on a historical basis, there is, as you say, a strong incentive to keep your costs as high as you can, so that you have that fat historical basis in the future. And if you have a should cost approach you counteract that to some extent.

Mr. ART. That is right.

If I may make another point, Mr. Chairman, I believe that the control over contract change orders is so important here. If profits are figured as a percentage of cost, and if you can increase your costs by increasing the qualitative requirements during development, if you do not have lids, you are going to end up increasing the size of your profit, because of the way profits are figured.

Chairman PROXMIRE. I want to get back to you, Mr. Yuspeh.

Both Professor Art and Mr. Fitzgerald discuss some of the difficulties in obtaining true competition. Can you give us an opinion about the obstacles to wider use of competition other than purely technical difficulties such as constructing adequate data packages?

#### TIME IMPORTANT IN CONSIDERATION TO COMPETE

Mr. YUSPEH. I think the biggest obstacle, as the Defense Department might see it, to wider use of competition deals with time. Sometimes it believes that it needs a system right now. For this purpose, there is hot line procurement. If DoD gets a rush order on something, and although it is in a position to compete it; if there is a producer already producing it at the moment, then it will go to him on a sole source basis.

Time is often an element. If there is a lot of time, DoD might be willing to go through what is necessary to compete an item.

Also, I think DoD really believes that certain items are just too technologically complex for competition.

Sometimes DoD talks of standardization in relation to technology. Admiral Rickover is a stickler for standardization on his submarines. DoD believes that if a second source comes in on a competitive basis, or if it just goes to another person to produce the item, that it will have to stockpile all types of smaller parts for the existing components on the larger system. And the result may be higher costs. But most of all, the Defense Department thinks the item may not work as well if it has two companies building it, or just a different company building it from the one who built it first.

#### MAIN OBSTACLES TO COMPETITION—DOD'S POINT OF VIEW

So I think, just in review, the two areas that the Defense Department sees as important obstacles to competition (1) time, and (2) technology. And the major concerns are how hard the item is to produce and how many producers there are that DoD believes are really capable of making the item.

Chairman PROXMIRE. How do we overcome this? Or if not overcome it, I suppose it is legitimate to a considerable extent. How do we determine the extent to which it is legitimate?

#### FORCE DEFENSE CONTRACTORS TO PROVIDE COMPLETE DATA PACKAGES

Mr. YUSPEH. As far as the standardization question goes, I am not convinced personally that it is a valid argument against competing an item. The Defense Department has what it calls a Chinese copy. And if a data package is very complete, such as in the case of the APX-72 airborne transponder; when Honeywell won the competitive contract over Bendix, Bendix had to supply an absolutely complete data package to Honeywell. Honeywell produced a Chinese copy, a copy virtually identical to the APX-72 that Bendix produced. By making sure that data packages are complete, the technology problem can be overcome. And usually, because sole source producers realize that the data package can often be a significant item standing in the way of going competitive, there are tendencies for them to try to keep the data package incomplete. Sometimes there are holes in the data package; sole source contractors claim that a particular part of the development for the item was developed on their own time with their own money. It is proprietary. And so even after you receive the data package, it is not like receiving instructions to a model, where you just put the pieces together and that is it. There are holes in the data package many times. And I think that if there were pressures put on the sole source producers to come through with a complete data package, even to the point of threatening reduction of future business if they do not come forward with it, many systems could be released for possible future competition.

#### NECESSITY OF SHOULD-DELIVERY DATES

And as far as the time element goes, I think Congress can take a look at it and see whether it is really valid, I was told that quite often

the delivery date for a particular item is going to be a particular time no matter what. Gordon Rule's office now asks for contracts in terms of the desired delivery date. And also the most economical delivery date. As it turns out, the most economical delivery date is usually the date DOD received the item anyway. The desired date is more or less a function of exactly what it says—someone's desires—when they would like to have it. Often what happens is that DOD will go to a contractor, and it will negotiate a contract on the basis of the desired delivery date. And the item will cost a little bit more, because the producer has to speed up operations in order to meet dead lines. It turns out later that he cannot produce it on time anyway. He must ask for more money to expand operations. And the result is that DOD receives it at the time that everybody knew was the earliest reasonable delivery date in the first place.

Chairman PROXMIRE. And made more from it?

Mr. YUSPEH. Right. And we not only paid more for it initially but claims resulted, since operations were expanded. And it seems like the thing that Congress should do is start using more economical delivery dates. In other words, when DOD says it would like to have an item for a certain time, question the DOD officials vigorously. Do you really believe that it is possible to receive it then, or if you waited 6 months, do you think you could save a lot of money? Would there be sufficient time to compete it?

Chairman PROXMIRE. In other words, a should delivery date as well as a should-cost basis?

Mr. YUSPEH. Yes, I think that is significant. This thing, as I see it, is more or less an excuse for not competing.

Chairman PROXMIRE. I have another vote, and I will be back in just a few minutes.

The subcommittee will stand in recess.

[A short recess was taken.]

Chairman PROXMIRE. Mr. Yuspeh, you said in your remarks that you interviewed a number of Defense officials in the course of your research. Did any of them explain why competition is used so rarely in procurement in view of the established requirement in the law, and also in view of the fact that the record shows that only about 10 percent of procurement is by advertising competitive bidding?

DOD CONTRACTING OFFICIALS UNAWARE OF THE MINIMAL USE OF  
COMPETITION FOR PROCURING WEAPONS SYSTEMS

Mr. YUSPEH. No, most of them in fact were sort of surprised on first reaction when I asked them.

Chairman PROXMIRE. Surprised at what?

Mr. YUSPEH. Surprised that there were as few cases as there were. Evidently they just had not thought about it. The initial reaction when I would talk to them was, "Oh, come on down, I have plenty of cases like that." And by the time I got there they would say, "there are only two or three."

Chairman PROXMIRE. It is astonishing, they did not really realize what they were doing.

Mr. YUSPEH. No, not at all. And quite often what they thought might have been competition really was not; there was something else involved in it. And I know although you used the figure of 10 percent,

I would guess that for really complex systems the figure is quite a bit lower than that.

Chairman PROXMIRE. I am sure it is.

#### COMPETITION USED TO PROCURE MOSTLY SMALL PARTS

Mr. YUSPEH. Competitive procurement seems to be mainly used for things like fuses and repair parts—little dinky items. And even then you could probably go out to some kind of an electronic shop and buy them at a much lower price than the Defense Department buys them for by contract. But that is a different story altogether.

#### MORE ON THE IMPORTANCE OF TIME—AVOIDING EMERGENCY BUYS

I would just like to add one point. When I was talking about the time problems, I made the assumption that we were talking about winner-take-all competition. However, there would be a difference for dual source procurement, where two companies are competing, but each realizes that it will get some share of the competition—the one with the lower price getting the larger share and the one with the higher price getting the smaller share. Time would definitely not be an issue there. And the reason is that if you have two sources and you are going to have dual source procurement, then you should be planning ahead. And what should be done, if you need something in 6 months, is the following. If company B is producing now, then you could have company A cover the later contract. So when you have two sources producing, that reduces the validity of the emergency excuse, that we have to have it right now. Because if DOD had planned ahead, it could have another producer in a position to produce the item and it would have a competitive contract already signed. Time would not be in issue at all.

I just wanted to add that.

Chairman PROXMIRE. Mr. Art, your fifth recommendation in your prepared statement is a recommendation that I find that I can support with great enthusiasm. It is a recommendation that procurement officials be upgraded and be made more independent of the military.

This raises a number of questions, as you know. Is procurement in your view in the Pentagon primarily under the control of the military or the civilians?

#### TOO MUCH CONTROL BY THE MILITARY OF DOD PROCUREMENT

Mr. ART. I think that is a difficult question to answer. What is clear to me is—

Chairman PROXMIRE. Do you think it is a problem?

Mr. ART. I think it is a definite problem. I think that daily control over development is by the military. And if you add that to the number of contract change orders that occurred on major programs, it is very clear that the intent of the top civilian officials is diluted, there is no way around it. The problem, as I understand it—I was leafing through my testimony for statements made by Robert McNamara in 1963, who said in 1963 that the program manager in the military services, should be a central point of control and information, and

shall be rewarded in his career by the prompt and analytical disclosure of his problem as well as for his successes.

And there is a nice quote by David Packard in 1970 to the effect that nothing has really changed in a 7-year period:

"With the long tradition of putting a general in charge of the battle, or putting an admiral in charge of a fleet, one would think it would be easy to get the services to accept the proposition that you should have one man with authority in charge of a weapon development and acquisition program."

And that has been a handicap. And I think the reason is clear to me.

Program managers do two things. One, they spend time, as Admiral Rickover once put it, checking with everybody up the chain of command. And two, they spend time worrying about whether what they are doing is going to serve them in their long-term interest. Many of the services are in a very strange position which I find very puzzling. Weapons systems are viewed as central to their role to their ability to claim resources from present and future budgets. Weapons systems are viewed by them as essential to fighting any war. And yet the very people that are supposed to be responsible for developing these weapons systems are not rewarded in the way that civilians want them to be rewarded, which is producing systems that are good enough but not necessarily with all the qualitative improvement. Weapons program management, as I understand it, is not highly regarded in the military services. What is most highly regarded for advancement is combat command or squad duty.

Chairman PROXMIRE. There is a lot of merit in that, in that we have tended to shortchange combat and to put fewer people into combat divisions, and so forth, in the Army especially and the Navy and the Air Force, too, and we have had a whale of a lot in supply and support.

Are you implying at least that this should be under civilian control, and that it would be easier to provide authority and prestige and upgrade it if it were civilianized?

Mr. ART. In all honesty, I must admit that I waiver. What is clear is that the program manager, if he wants to control costs, has a very difficult time doing so, because of the way the system is structured. I see one of two paths. Either intervene in some procedural way in the service career promotion system, so that weapons system management is considered an honorable and worthwhile and useful profession, or if you cannot get that to work, move to a civilian system.

Now, it is hard for me as an outsider—

Chairman PROXMIRE. But as long as the military hierarchy has the last word on procurement decisions, assuming it does, will it not be impossible to separate military program managers out from under its control?

Mr. ART. I think that I would come down with a yes on that.

#### PROCUREMENT PROCESS IN THE DEFENSE DEPARTMENT SHOULD BE CIVILIANIZED

Chairman PROXMIRE. Would that not be a fairly strong argument to try to civilianize—

Mr. ART. I think it is a very strong argument. My only problem is that I see what happens with bureaucracies, and I can see all sorts of problems with a civilian bureaucracy.

Chairman PROXMIRE. At least as many problems with the military bureaucracy.

Mr. ART. I think that is true. My feeling is that if, in fact, serious study is given to this, by the very fact of implementing such a study by Congress, for example, the services may be forced through that very threat to in fact do the kind of things that many of us feel should be done, which is to upgrade the status and position of the program manager.

Chairman PROXMIRE. Would you comment on this, Mr. Fitzgerald?

Mr. FITZGERALD. I think that it would certainly be desirable to civilianize the process, for reasons that I have testified to here before, particularly back in 1969, June of 1969. But the overriding consideration is the thing that steers any large organization—bureaucracies or businesses or whatever—and that is the rewards and punishments system. I think it is possible for the current system to work, or any of a number of two or three systems I have seen in the past. But you have got to motivate people to want to do better. It is a very difficult thing to do when you say, "do better." That involves taking money away from giant corporations. There is just no percentage from the standpoint of a colonel bucking for brigadier general in going out and kicking General Dynamics in the shins. It is not going to help him. And he knows that.

Chairman PROXMIRE. Or a colonel who will be retiring within a few years and looking for a job. And his expertise, and so forth, would lead him into the defense contracting business.

Mr. FITZGERALD. I am very sympathetic with those people. I think it is necessary to have an up-or-out system in the military, or at least a form of one, and everybody cannot be a general. They get thrown into the job market at the peak of their family expenses, when their children are starting to college, and things like that. And where else do they know to hunt a job?

Chairman PROXMIRE. And also, we have a generous system of retirement.

Mr. FITZGERALD. It is a very generous system of retirement for a person who is truly retired. But when it is a guy who is in his forties and he has got three kids in college, he needs to supplement it as a rule. And the easiest way to supplement it, of course, is to stay on the good side of the giant contractors. So I think you have got to get away from all of those things.

But overriding everything is the rewards and punishments system. I have testified here before, up until the time I was fired from the Pentagon, I never saw anyone fired for cost overruns. It seemed, conversely, that the fatter the programs got, the bigger the job of program manager became. We saw that on the F-111. It was initially managed by a colonel, and then a brigadier general, and then a major general—

Chairman PROXMIRE. But we do have efficient procurement. I have had the feeling—and maybe you can correct me on this—for a long time, that Admiral Rickover does a first-rate job. And there are no fat nuclear propulsion contracts, as far as I know. Maybe we could start at the top to improve the system, and put people like Admiral Rickover in positions of authority.

Mr. FITZGERALD. Yes. And I think from the Congress point of view, you have got to find some way to motivate people, as you say,

from the top down. And as it stands—I think we saw that again yesterday—what do you do when you have a cost problem, when you need more money than you have got? You ask for more money. It is almost as simple as being a banker, Senator. You write that money you need down on the financial requirements, and it becomes money. You write the \$2 billion of extra money down on the Contractors Financial Requirements Estimate—or I think they call it the Contract Fund Status Report today—and given time, it will go through, though some of it be cut off and trimmed back or deferred. But they can almost, in a banker-like fashion, create money just by writing numbers on a piece of paper. And there is no reason to go——

WHY IS THE PROCUREMENT PROCESS IN THE DEFENSE DEPARTMENT SO INEFFICIENT?

Chairman PROXMIRE. Why is it that we have had some very, very wise and competent people in charge? We had Secretary Packard, who I think, on the basis of testimony, is a man that we would say understood this process, and made some excellent recommendations and we had the Fitzhugh Commission, which consisted largely of people who were in the defense contracting area, at least related to it. But they made some very good suggestions, too. And yet, we seemed to proceed along on the same wasteful, extravagant, fat, inefficient basis. We do not seem to be able to get a real grip on it.

Mr. FITZGERALD. I think this goes again right to the reward and punishment and motivation situation. We have had brilliantly successful businessmen, a whole series of them, running the Pentagon. We had Wilson under Eisenhower, and Secretary McNamara, and many others who have, I think, at least when they first started out, tried hard to improve it.

There is one thing that everyone I have known has overlooked. They have failed to recognize that the subordinate managers in the Pentagon, or in that whole hierarchy, do not have the same motivation as their branch managers had at General Motors, or Ford, or wherever. You do not have the discipline of the profit and loss statement. There is no reason under the sun for the subordinate managers to do the very difficult things they have to do to keep costs down. We simply have not provided the motivation for them to do that. It is not there. If they need money——

Chairman PROXMIRE. Is there anything either historically or in other countries, any other experience that we can rely on to secure that?

AS LONG AS MONEY IS READILY AVAILABLE FOR ANY PURPOSE, MOTIVATION TO BE EFFICIENT WILL BE UNDERMINED

Mr. FITZGERALD. I think necessity is the only thing that motivates people who work as hard as you must work to run an efficient business or organization. There are some people who just love it. And I think you have the rare individual like Admiral Rickover who is motivated for a variety of reasons. But I think as long as there is a superabundance of money, and they can always get more just by writing it down on a piece of paper, that you are never going to change it.

Chairman PROXMIRE. Then, as far as Congress is concerned, the one

obvious action we can take is to run a very tight ship and cut down on the available funds for procurement.

Mr. FITZGERALD. I think that, properly done, would help a great deal. But if it is done in a way that it is typically done it will not help much on efficiency, Mr. Chairman. Typically, when the Congress cuts the procurement budget, they also relieve the Pentagon of responsibility, at least to a proportional degree.

Chairman PROXMIRE. By cutting the particular systems out or delaying them.

Mr. FITZGERALD. That is right.

Chairman PROXMIRE. Instead, if we cut the overall amount would that be more helpful?

Mr. FITZGERALD. I certainly believe it would. In addition to that, I think it would be useful to encourage the Secretary of Defense—and the secretaries of the military departments—to withhold contingency funds—I know you cannot call them contingency funds, but that is what they are, the money over and above the contract that is in the program—at their level, at the top level, because if the money is ever laid on the program, it will be spent, whether it is needed or not. The overrun funds are provided in advance, and then the rules of the game require that you spend all your money before the end of the year. We guarantee cost overruns.

Chairman PROXMIRE. We get a lot of criticism when we do this sort of thing. I have proposed a number of times, and others have proposed a 5-percent cut or a 10-percent cut, or some percentage cut in procurement. And they always argue, now, you ought to be specific. If you think that the aircraft carrier or the B-1 bomber or the Trident submarines or something should not proceed as rapidly or should be cut back in some way, do that. And they tell us do not make this meat cleaver or overall cut without taking responsibility and indicating where the cuts should be. On the other hand, you say this would be the best substitute for the profit motive. If they knew they had to live within a constrained cost system, then they would definitely have an incentive for holding their costs down.

Mr. FITZGERALD. And definitely better approaches to buying things and controlling them. Right now it does not matter. It is not a major consideration. And the people have got to be made to believe that their careers and their advancement depends on how well they do against these goals. And they should be tough but attainable goals. I do not think you should be too harsh right at first. But as Mr. Yuspeh's study has shown, and as the AMC study shows, there is lots of room for improvement. If you make people believe it is real, that it is necessary to do it, I think things will begin to shape up.

Chairman PROXMIRE. Gentlemen, thank you very, very much. It has been very helpful indeed. And I appreciate it. You have provided a lot of information and a real challenge.

Tomorrow we have two representatives of the Department of Defense who will appear before us, Assistant Secretary Mendolia of Defense and Assistant Secretary Bowers of the Navy. The subcommittee will stand in recess until 10 o'clock tomorrow morning, when we will reconvene in this room.

[Whereupon, at 12:25 p.m., the subcommittee recessed, to reconvene at 10 a.m., Friday, November 16, 1973.]

# THE ACQUISITION OF WEAPONS SYSTEMS

FRIDAY, NOVEMBER 16, 1973

CONGRESS OF THE UNITED STATES,  
SUBCOMMITTEE ON PRIORITIES AND  
ECONOMY IN GOVERNMENT OF THE  
JOINT ECONOMIC COMMITTEE,  
*Washington, D.C.*

The subcommittee met, pursuant to recess, at 10:05 a.m., in room S-407, the Capitol, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard F. Kaufman, professional staff member; Michael J. Runde, administrative assistant; and George D. Krumbhaar, Jr., minority counsel.

## OPENING STATEMENT OF CHAIRMAN PROXMIRE

Chairman PROXMIRE. The subcommittee will come to order.

This subcommittee has been investigating waste in government spending, particularly in procurement, for many years. Suddenly, as we draw closer to what may be a period of prolonged shortages of fuel and many other products, the prevention of waste has become a popular topic.

In government the terms "waste" and "fat" are often synonymous. An agency that has funds and resources to waste is a fat agency.

## OVERSIZED MILITARY ESTABLISHMENT DISTORTS THE DOMESTIC ECONOMY

Yesterday's disclosure that the Defense Department has commandeered part of the domestic supply of oil drives home the point that an oversized military establishment imposes itself upon and distorts the domestic economy in many ways.

No one likes to be told he should stop wasting the taxpayers' money even though it would be to his advantage to do so. Agency heads especially dislike such criticism when it is directed against their agencies and it is normal for many persons in the Pentagon to feel resentful toward those who point out how wasteful the Military Establishment is.

There is a kind of it-you're-not-for-us-you're-against-us syndrome throughout the defense community. Practically any type of criticism may be interpreted in defense circles as a savage attack and earn an antimilitary label for the critic.

What is sometimes forgotten is that there is an overriding public interest in defense and national security to which the interest of any

military person, any defense official and any private contractor is subordinate. When those interests are in conflict the public interest must prevail.

AN OVERLY EXTRAVAGANT MILITARY PROGRAM WEAKENS THE UNITED STATES

I support a strong defense program. Our military should be second to none. We weaken ourselves, however, by being too extravagant.

I am convinced that the Military Establishment is loaded down with too many high-ranking officers and civilian officials who are allowed to have too many chauffeured limousines, too many military aircraft for purely private use and too many personal servants.

We have too many men overseas and unnecessary foreign bases. We have too heavy a support tail compared with our combat forces.

In many instances we are buying the wrong types of weapons and costs have been allowed to rise so high that many persons believe we are unable to buy the quantities we need.

We are experiencing a high and unacceptable level of waste and mismanagement in defense procurement and it is costing the American taxpayer hundreds of millions of dollars annually.

Our witnesses this morning are in the unique position of being able to do something about what former Under Secretary David Packard called the procurement mess. I want to welcome Assistant Secretary of Defense A. I. Mendolia and Assistant Secretary of the Navy Jack L. Bowers, both of whom are recent appointees and will be testifying before this subcommittee for the first and I hope not the last time.

You gentlemen may proceed in any way you wish.

Mr. Mendolia is prepared to go first and then we will have Mr. Bowers.

STATEMENT OF HON. A. I. MENDOLIA, ASSISTANT SECRETARY OF DEFENSE (INSTALLATIONS AND LOGISTICS), ACCOMPANIED BY J. M. MALLOY, DEPUTY ASSISTANT SECRETARY OF DEFENSE (PROCUREMENT), OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE (I. & L.); AND DON R. BRAZIER, PRINCIPAL DEPUTY TO THE ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)

Mr. MENDOLIA. Mr. Chairman, it is a pleasure to represent the Department of Defense before the Joint Economic Committee today. I have with me on my left Mr. John Malloy, who is Deputy Assistant Secretary of Defense for Procurement in my office, and Mr. Don Brazier, on my far left, who is Principal Deputy to the Assistant Secretary of Defense (Comptroller.)

Your letter of November 1, 1973, indicated that the subcommittee is interested in discussing several issues relating to the acquisition of major weapons systems. These include shipbuilding claims, the build and charter program for tankers, the comparative costs of negotiated and competitive contracts, subcontracting, should-cost, and cost control efforts generally. From discussions with your staff we also understand you are interested in payments into pension funds, progress payments, and cost accounting standards. My statement will cover these areas, except shipbuilding claims and the build and charter program

for tankers, which will be handled by Mr. Bowers, whom you have also invited to testify today.

#### NAVY DESIRES COMPETITION, BUT CAN'T IMPLEMENT IT OFTEN

You indicated an interest in enhancing competition for defense contracts. One cannot be against competition. We desire it, and not simply because the law requires it. Competition is desirable for business and customer alike. We in defense certainly invoke it wherever appropriate. If we can stabilize a design to avoid a sole source or a limited number of sources, we do so. However, it is not always possible to design or describe an item in such detail that firms can bid on it.

Attempting to get competition in some cases can be counterproductive. We have had good and poor experiences in the transition from noncompetitive to competitive procurements.

Competition, both price and technical, is obtained in a large percentage of defense contracts. In fiscal year 1973, such competition accounted for 43.2 percent of the total DOD procurement of \$33.5 billion.

Effective price competition occurs in both formally advertised and negotiated procurement. We consider that price competition exists if offers are solicited and (i) at least two responsive offerors, (ii) who can satisfy the Government's requirements, (iii) independently contend for a contract to be awarded to the responsive and responsible offeror submitting the lowest evaluated price, and (iv) by submitting priced offers responsive to the expressed requirements of the solicitation. Whether there is price competition for a given procurement is a matter of establishing that each of the foregoing conditions is satisfied.

#### FORMAL ADVERTISING USED MAINLY FOR SUPPLIES AND SERVICES—NOT APPROPRIATE FOR ACQUIRING WEAPONS SYSTEMS

As you know, formal advertising is widely used by a majority of our purchasing officers for the purchase of supplies and services necessary to operate our bases. In this sense the Government is similar to any large organization which purchases supplies. However, such procurement is generally inappropriate for the acquisition of weapon systems, since detailed specifications are usually unavailable, or in instances where extensive research and development efforts are required. Frequently, negotiations are required to arrive at a clear understanding between buyer and seller as to the scope of effort envisioned. Unfortunately some critics equate negotiations with noncompetitive procurement. This is clearly not the case. The report of the Commission on Government Procurement noted the limitations inherent in the use of formal advertising and recommended that competitive negotiation be recognized in law as a normal, sound buying method which the Government should prefer where market conditions are not appropriate for the use of formal advertising.

#### DOD USES COMPETITIVE NEGOTIATION

The principal difference between formal advertising and negotiation is the inability under formal advertising, after the receipt of bids, to discuss any matter with bidders. The use of competitive price negotiation rather than formal advertising is fully endorsed by the law in

many situations—for example, set-asides for small business or labor surplus firms, the procurement of subsistence, purchases made using simplified small purchase procedures, or procurements from mobilization base producers. In fiscal year 1973, 23.6 percent of our procurement was placed through price competitive negotiation.

The third type of competitive contracting is technical and design competition. In research and development, it is generally not possible to formulate precise specifications necessary for formal advertising, and therefore, negotiation is necessary. However, our programs are designed to encourage wide participation by American industry in research and development contract awards by awarding our contracts on the basis of the best technical proposal, price, and other factors considered. Since a successful research and development program very likely will result in the production of hardware, technical and design competition at this stage is extremely vigorous.

While some systems were originally awarded on a competitive basis, follow-on quantities can generally be obtained economically only from the single system prime contractor. In fiscal year 1973, \$4.8 billion, or 14.4 percent of our procurements were follow-on to previous price or design competition awards. Thus, some kind of competition was a factor in approximately 58 percent of our procurements in fiscal year 1973.

#### LARGE AMOUNT OF DEFENSE DEPARTMENT PROCUREMENT NOT ON COMPETITIVE BASIS

Despite our best efforts to utilize various techniques to maximize competition, a large segment of DOD procurement is not placed on a competitive basis. Many major programs have little potential for competition. Included here are such major systems procurements as Safeguard, Trident, nuclear aircraft carriers, the operation and maintenance of Government-owned ammunition facilities, and utility services.

Where we cannot effectively obtain competition, our procurement procedures are designed to assure that equipment is obtained at the lowest possible cost. Contractors are required to submit detailed cost data which is subjected to an audit, price analysis, and technical evaluation. After such evaluation, skilled negotiators attempt to obtain the lowest possible cost to the Government.

I will continue to emphasize the need for maximizing competitive procurement while at the same time recognizing the limitations in certain fields. For example, there is only one shipyard today willing and able to construct nuclear aircraft carriers.

Chairman PROXMIRE. Mr. Mendolia, because our time is short, if you can do it, if you want to skip over any part of the prepared statement at all, the entire prepared statement will be printed in full in the hearing record.

Mr. MENDOLIA. All right, I could move on, say, to the heading "Progress Payments."

The steady downward trend in the amount of cost-based progress payments outstanding—unliquidated—since fiscal year 1970 has continued through the past fiscal year, 1973. The increasing trend in outstanding shipbuilding progress payments, however, has slowed the downward trend in total outstanding progress payments.

NEW PROGRESS PAYMENTS FOR SHIPBUILDING BASED ON COSTS INCURRED  
AND PHYSICAL PROGRESS

One significant change has been made to the DOD progress payment policy during this calendar year. This change was instituted by the Department of Navy this past March. It involves progress payment procedures under fixed price and fixed price incentive contracts for shipbuilding or ship conversion, alteration, or repair. These new procedures will result in shipbuilding progress payments being based on a combination of costs incurred and physical progress rather than solely on a percentage or stage of completion.

PENSION FUND PAYMENTS MUST BE MADE DURING A COMPANY'S FISCAL YEAR

Next, a few words on contractor retirement fund payments. In May of 1972, the General Accounting Office, GAO, brought to our attention the fact that contributions to the employees' pension funds were not being made by some contractors until well after the company's fiscal year. In July of 1972, we reviewed 35 major contractors and found that many contractors were delaying pension fund payments for significant periods after the end of their fiscal year. Although this action was authorized by our regulations and those of the Internal Revenue Service, we, nevertheless, decided to issue new guidance to our people.

The policy, as revised, provides that unless pension fund payments are made by the contractor within 30 days after the end of each quarter of this fiscal year, such costs cannot be reimbursed on cost-type contracts or through progress payments until actual payment is made into the pension fund. In addition, increased pension costs caused by the delayed funding would be disallowed.

MORE ATTENTION TO "DESIGN-TO-COST"

In the area of cost control, we are giving increased attention to the design-to-cost concept. The objective of this approach is to induce designers to be cost conscious so that they will make tradeoff decisions based on cost versus performance. The establishment of predetermined cost ceilings is intended to filter down to subsystem and component level and to trigger redesign, where necessary, to meet these goals. In addition to providing flexibility in choosing levels of quality and performance in the design phase, it is also intended to provide tradeoffs on production schedule in the manufacturing phase. Comparisons among competing systems as well as within the existing system is also envisioned. The design-to-cost approach is no panacea, and it must be selectively applied. It appears to offer the greatest potential in programs which have low development risk and high production. Component and subsystem development programs are good design-to-cost candidates. Along with acquisition cost, costs of ownership are also presented to the designer as a parameter.

"SHOULD-COST" WORTHWHILE MOSTLY FOR NEGOTIATED CONTRACTS

Your letter mentioned "should-cost" as a separate subject, and I will speak to that briefly. One of our attempts to improve the pricing of selected contracts has been the "should-cost" concept. With this

method, the various disciplines of contracting, audit, and engineering are coordinated to develop the Government's negotiation objective. Working in this way, we are better able to identify and challenge inefficiencies and other unacceptable actions on the part of either the contractor or the Government. The concept is most effective in non-competitive procurement environments when we believe that there is need for improvement of this kind and the procurements are relatively large. The GAO has recently completed reviews of our "should-cost" activities and found that the results have been worthwhile. They recommended improvements in our procedures for followup and long-range goal monitorships which are being corrected by the services. We intend to continue to support this approach to pricing in appropriate situations.

My final topic is cost accounting standards which I know is of considerable interest to you.

The current standards issued by the Cost Accounting Standards Board have been in effect for a sufficient period of time to determine their effect on defense contracts. Contractors, subject to these requirements, must comply with standards in effect on the date of award of each contract and any subsequent standards which thereafter become applicable. Cost Accounting Standards Board regulations provide further for an equitable adjustment if costs on a contract are affected by a disclosure statement change which a contractor is required to make pursuant to issuance of subsequent standards. Although it is too early to predict the extent of such adjustments, the DOD is concerned about the volume of these possible contract price changes and the impact they may have on administrative workload.

And I am prepared to answer questions, Mr. Chairman.

[The prepared statement of Mr. Mendolia follows:]

#### PREPARED STATEMENT OF HON. A. I. MENDOLIA

Mr. Chairman, it is a pleasure to represent the Department of Defense (DOD) before the Joint Economic Committee today. Your letter of November 1, 1973 indicated that the Committee is interested in discussing several issues relating to the acquisition of major weapons systems. These include shipbuilding claims, the build and charter program for tankers, the comparative costs of negotiated and competitive contracts, subcontracting, should-cost, and cost control efforts generally. From discussions with your staff we also understand you are interested in payments into pension funds, progress payments, and Cost Accounting Standards. My statement will cover these areas except shipbuilding claims and the build and charter program for tankers which will be handled by Mr. Bowers, whom you have also invited to testify today.

#### COMPETITION

You indicated an interest in enhancing competition for Defense contracts. One cannot be against competition. We desire it, and not simply because the law requires it. Competition is desirable for business and customer alike. We in defense certainly invoke it wherever appropriate. If we can stabilize a design to avoid a sole source or a limited number of sources, we do so. However, it is not always possible to design or describe an item in such detail that firms can bid on it. Attempting to get competition in some cases can be counterproductive. We have had good and poor experiences in the transition from noncompetitive to competitive procurements.

Competition, both price and technical, is obtained in a large percentage of Defense contracts. In FY 1973, such competition accounted for 43.2% of the total DOD procurement of \$33.5 billion. Effective price competition occurs in both formally advertised and negotiated procurement. We consider that price competition exists if offers are solicited and (i) at least two responsive offerors, (ii)

who can satisfy the government's requirements, (iii) independently contend for a contract to be awarded to the responsive and responsible offeror submitting the lowest evaluated price, (iv) by submitting priced offers responsive to the expressed requirements of the solicitation. Whether there is price competition for a given procurement is a matter of establishing that each of the foregoing conditions is satisfied.

As you know, formal advertising is widely used by a majority of our purchasing offices for the purchase of supplies and services necessary to operate our bases. In this sense the government is similar to any large organization which purchases supplies. However, such procurement is generally inappropriate for the acquisition of weapon systems, since detailed specifications are usually unavailable, or in instances where extensive research and development efforts are required. Frequently, negotiations are required to arrive at a clear understanding between buyer and seller as to the scope of effort envisioned. Unfortunately some critics equate negotiations with noncompetitive procurement. This is clearly not the case. The Report of the Commission on Government Procurement noted the limitations inherent in the use of formal advertising and recommended that competitive negotiation be recognized in law as a normal, sound buying method which the government should prefer where market conditions are not appropriate for the use of formal advertising.

The principal difference between formal advertising and negotiation is the inability under formal advertising, after the receipt of bids, to discuss any matter with bidders. The use of competitive price negotiation rather than formal advertising is fully endorsed by the law in many situations—e.g., set-asides for small business or labor surplus firms, the procurement of subsistence, purchases made using simplified small purchase procedures, or procurements from mobilization base producers. In FY 1973, 23.6% —of our procurement was placed through price competitive negotiation.

The third type of competitive contracting is technical and design competition. In research and development, it is generally not possible to formulate precise specifications necessary for formal advertising, and, therefore, negotiation is necessary. However, our programs are designed to encourage wide participation by American industry in research and development contract awards by awarding our contracts on the basis of the best technical proposal, price, and other factors considered. Since a successful research and development program very likely will result in the production of hardware, technical and design competition at this stage is extremely vigorous.

While some systems were originally awarded on a competitive basis, follow-on quantities can generally be obtained economically only from the single system prime contractor. In FY 1973, \$4.8 billion, or 14.4% of our procurements were follow-on to previous price or design competition awards. Thus, some kind of competition was a factor in approximately 58% of our procurements in FY 1973.

Despite our best efforts to utilize techniques to maximize competition, a large segment of DOD procurement is not placed on a competitive basis. Many major programs have little potential for competition. Included here are such major systems procurements as Safeguard, Trident, nuclear aircraft carriers, the operation and maintenance of government-owned ammunition facilities, and utility services.

Where we cannot effectively obtain competition, our procurement procedures are designed to assure that equipment is obtained at the lowest possible cost. Contractors are required to submit detailed cost data which is subjected to an audit, price analysis, and technical evaluation. After such evaluation, skilled negotiators attempt to obtain the lowest possible cost to the government.

I will continue to emphasize the need for maximizing competitive procurement while at the same time recognizing the limitations in certain fields. For example, there is only one shipyard today willing and able to construct nuclear aircraft carriers.

Your letter, Mr. Chairman, specifically asked about the comparative costs of sole source versus competitive contracts.

Obviously, it is difficult to compare on a one-for-one basis the cost for a contract which is noncompetitive with one that is competed. We can only choose one method for any given procurement. We can't then evaluate something which we didn't do. What the result might have been if another method had been used can only be surmised.

The study undertaken by your Committee, Mr. Chairman, illustrates the kind of price reductions that can be achieved when a program reaches the stage

where competition can be effective. As illustrated by your study, we introduce competition as early as practical in a procurement program. Obviously, when developing new technical military items, we normally must continue with the developer until the item has been proved and design is stable. One could speculate that competition would have been possible earlier, but these are matters of judgment. There are no absolute, objective standards which mark the threshold for going competitive.

Notwithstanding the benefits of competition which are amply documented from our own experience, there is the specter of not getting the results of competition that one seeks. By this I mean that competition which is ill-advised may result in losses for the company and nondelivery of material to the buyer. Every buyer has experienced this and it is this phenomenon that rightly introduces caution in deciding to exploit price competition.

#### SUBCONTRACTING

Next, I would like to discuss subcontracting. It is the policy of the DOD to require our prime contractors to select and effectively monitor their subcontractors. We closely monitor prime contractors' subcontract programs when they concern (1) major DOD programs, (2) large volume or significant size procurements, and (3) other procurements identified as critical to our interest. We maintain visibility over prime contractors' subcontract management through our field contract administration and audit force. Admittedly, this may not be all encompassing in the sense of reviewing every subcontract that is placed by a prime contractor, but has as its goal ensuring that a prime contractor's over-all purchase program is generally acceptable.

Surveillance techniques, such as the DOD Contractor Procurement System Review, are used to determine whether the contractor's purchasing system is adequate. This covers his make or buy policies, use of competition in subcontracting, and his ability to determine reasonableness of subcontractors prices. The review also examines the contractor's compliance with statutory requirements and price contract clauses. We selectively reserve the right to consent to certain subcontracts that involve critical components which have significant impact on high priority programs. Subcontractors also are legally obligated to comply with certain other provisions of the prime contract by use of DOD prescribed "flow-down" clauses, e.g., socio-economic and safety requirements, access to records, inspection of material at source, etc.

Prime contractors include subcontracting plans as a part of their proposals. Our field contract administration and audit personnel often closely examine specific subcontractor proposals.

#### PROGRESS PAYMENTS

The steady downward trend in the amount of cost-based progress payments outstanding (unliquidated) since fiscal year 1970 has continued through the past fiscal year (1973). The increasing trend in outstanding shipbuilding progress payments, however, has slowed the downward trend in total outstanding progress payments. This situation is reflected in the following table:

#### PROGRESS PAYMENTS (COST BASED PLUS SHIPBUILDING) AMOUNTS OUTSTANDING (UNLIQUIDATED)

[In millions of dollars]

Department/Agency	June 30—			
	1970	1971	1972	1973
Army.....	943	718	494	508
Navy.....	2,382	2,175	2,046	1,876
Air Force.....	4,693	2,516	1,845	1,550
DSA.....	9	13	10	11
Total cost based.....	8,027	5,422	4,395	3,945
Shipbuilding.....	1,814	2,301	2,648	3,081
Total amount.....	9,841	7,723	7,043	7,026

## CHANGES IN PROGRESS PAYMENT POLICY

One significant change has been made to the DOD progress payment policy during this calendar year. This change was instituted by the Department of Navy this past March. It involves progress payment procedures under fixed price and fixed price incentive contracts for shipbuilding or ship conversion, alteration, or repair. These new procedures will result in shipbuilding progress payments being based on a combination of costs incurred and physical progress rather than solely on a percentage or stage of completion. The new procedures are expected to place progress payments to shipbuilders on a more uniform footing with other contractors, consistent with the recognition of factors unique in shipbuilding—the inherently long production time, relatively high capital requirements, and the comparatively few units for delivery. The Patrol Frigate and the submarines for the Trident program, both presently being negotiated, will be the first contracts to contain progress payment provisions based on the new policy.

## CONTRACTOR RETIREMENT FUND PAYMENTS

In May of 1972, the General Accounting Office (GAO) brought to our attention the fact that contributions to the employees' pension funds were not being made by some contractors until well after the close of the company's fiscal year. In July of 1972 we reviewed 35 major contractors and found that many contractors were delaying pension fund payments for significant periods after the end of their fiscal year. Although this action was authorized by our regulations and those of the Internal Revenue Service, we, nevertheless, decided to issue new guidance to our people.

The policy, as revised, provides that unless pension fund payments are made by the contractor within 30 days after the end of each quarter of his fiscal year, such costs cannot be reimbursed on cost type contracts or through progress payments until actual payment is made into the pension fund. In addition, increased pension costs caused by the delayed funding would be disallowed.

## COST CONTROL

In the area of cost control, we are giving increased attention to the design-to-cost concept. The objective of this approach is to induce designers to be cost conscious so that they will make trade-off decisions based on cost vs. performance. The establishment of predetermined cost ceilings is intended to filter down to subsystem and component level and to trigger redesign, where necessary, to meet these goals. In addition to providing flexibility in choosing levels of quality and performance in the design phase, it is also intended to provide trade-offs on production schedule in the manufacturing phase. Comparisons among competing systems as well as within the existing system is also envisioned. The design-to-cost approach is no panacea, and it must be selectively applied. It appears to offer the greatest potential in programs which have low development risk and high production. Component and subsystem development programs are good design-to-cost candidates. Along with acquisition cost, costs of ownership are also presented to the designer as a parameter.

In the final analysis, it is a balancing of acquisition cost and life cycle costs that will determine the design. Toward this end, Mr. Clements has issued a memorandum dated June 18, 1973 which directs that any major program subject to Defense Systems Acquisition Review Council (DSARC) review utilize the design-to-cost technique. While our design-to-cost program is in its initial stages, we are optimistic that it will be effective in motivating contractors toward simpler designs and more easily maintainable equipment. However, I am aware of the need for significant management attention to this concept if it is to be successful.

## SHOULD COST

Your letter mentioned "Should-Cost" as a separate subject, and I will speak to that briefly. One of our attempts to improve the pricing of selected contracts has been the "Should-Cost" concept. With this method, the various disciplines of contracting, audit, and engineering are coordinated to develop the government's negotiation objective. Working in this way, we are better able to identify and challenge inefficiencies and other unacceptable actions on the part of either the contractor or the government. The concept is most effective in non-competitive procurement environments when we believe that there is need for improvement of this kind and the procurements are relatively large. The GAO has recently completed reviews of our "Should-Cost" activities and found that the results

have been worthwhile. They recommended improvements in our procedures for follow-up and long range goal monitorship which are being corrected by the Services. We intend to continue to support this approach to pricing in appropriate situations.

#### COST ACCOUNTING STANDARDS

My final topic is Cost Accounting Standards which I know is of considerable interest to you. As you know, Public Law 91-379 (August 15, 1970) established the Cost Accounting Standards Board, independent of the Executive Departments, to promulgate cost accounting standards designed to achieve uniformity and consistency in the cost accounting practices followed by defense contractors and subcontractors under Federal contracts. The Board's original regulation requires contractors with negotiated defense prime contracts totaling more than \$30 million to submit a Disclosure Statement covering the accounting practices of each of its divisions and profit centers. The Board has also issued five standards up to this time. These rules, regulations, and standards are being incorporated in the Armed Services Procurement Regulation (ASPR) as issued, and the ASPR has been revised to establish policies and procedures for compliance.

The DOD's effort to date primarily has been in the area of review and evaluation of contractors' Disclosure Statements. Defense contract auditors and contracting officers have reviewed over 800 Statements to determine whether they adequately describe the actual or proposed contractors' cost accounting practices and whether the disclosed practices are in compliance with applicable cost accounting standards. Recently, the Cost Accounting Standards Board revised the threshold under which contractors are required to submit disclosure statements to encompass an additional number of contractors. It is anticipated that this change will require the submission and review of an additional 500 to 700 Disclosure Statements. The DOD has already provided over 130 audit and Contract Administration manpower spaces to support Cost Accounting Standards Board requirements and foresees the likelihood that more may be required.

The current standards issued by the Cost Accounting Standards Board have not been in effect for a sufficient period of time to determine their effect on defense contracts. Contractors, subject to these requirements, must comply with standards in effect on the date of award of each contract and any subsequent standards which thereafter become applicable. Cost Accounting Standards Board regulations provide further for an equitable adjustment if costs on a contract are affected by a Disclosure Statement change which a contractor is required to make pursuant to issuance of subsequent standards. Although it is too early to predict the extent of such adjustments, the DOD is concerned about the volume of these possible contract price changes and the impact they may have on administrative workload.

Chairman PROXMIRE. Thank you very much.

Mr. Bowers, the same general rule will apply to you. Whatever part of your prepared statement you skip over will be printed in full in the record.

**STATEMENT OF HON. JACK L. BOWERS, ASSISTANT SECRETARY OF THE NAVY (INSTALLATIONS AND LOGISTICS); ACCOMPANIED BY REAR ADM. R. L. BAUGHAN, JR., MAJOR SURFACE COMBATANT SHIPS PROJECT MANAGER; REAR ADM. K. L. WOODFIN, DEPUTY CHIEF OF NAVAL MATERIAL (PROCUREMENT AND PRODUCTION); REAR ADM. S. J. EVANS, DIRECTOR OF CONTRACTS, NAVAL AIR SYSTEMS COMMAND; CAPT. W. J. RYAN, DIRECTOR OF PROCUREMENT, OASN (I. & L.); E. G. LEWIS, GENERAL COUNSEL OF THE NAVY; AND R. A. CARL, SPECIAL ASSISTANT TO ASN (I. & L.) FOR TRANSPORTATION**

Mr. BOWERS. Mr. Chairman, I intend to keep my oral statement within 10 minutes, and I have so reduced it.

I would first like to introduce Rear Admiral Woodfin on my right, Deputy Chief of Naval Material—Procurement and Production.

Rear Admiral Evans, Director of Contracts for the Naval Air Systems Command.

Rear Admiral Baughan, who is project manager for major surface combatant ships.

Mr. Gray Lewis, who is the General Counsel of the Navy.

Captain Ryan, behind me, my Director of Procurement.

And Mr. Bob Carl, who is my Special Assistant for Transportation.

As you know, this is my first opportunity to present my views to your subcommittee since becoming the Assistant Secretary of the Navy for Installations and Logistics. My decision to accept this position was heavily influenced by the importance I attach to national defense and a strong belief that my some 27 years on the industry side of the defense business would permit me to make a genuine contribution to major weapon system acquisition. So, if I may, and since I am relatively new, I would like to give you a broad outline of my plans in the new job.

#### PROBLEM: TRANSLATING TECHNOLOGY INTO ECONOMICAL, EFFICIENT SYSTEMS

First, let me stress that I am convinced we have the necessary technology to provide for our defense. Sometimes we are criticized for too much goldplating. This has been true in some instances. In our enthusiasm to correct that problem, however, we should not fail to take advantage of the opportunities where technology can do jobs with much fewer men and equipment. But I agree that the bigger challenge lies in translating our technology into defense systems in an orderly manner, and that means lower cost and no mistakes.

We have made a great deal of progress in the last 20 years, but occasional failures in the acquisition process have continued. I think that is because you, and we, have concentrated on the contract form as the perennial villain. Problems have been ascribed to cost-plus-fixed-fee contracts, total package procurement and fixed-price contract forms, and we seem to always think a change in this area is the answer. However, under each contract era, problems have continued to crop up. That should tell us something.

#### IMPROVE ACQUISITION MANAGEMENT TO LOWER PROCUREMENT COSTS

I believe the basic issue is one of management. Therefore, it is my intention to concentrate on improving Navy management of the defense systems acquisition process.

The challenge as I see it, is to develop tools to keep the manager in control of the process—rather than inventing tools to control the manager.

I will discuss four areas where my office has set specific goals. These are headed by management and followed in proper perspective by contract form, the award process, and program execution.

#### NECESSARY CHANGES IN PROJECT MANAGEMENT

In management, I want to emphasize project management authority. The manager must be in full control. If we dilute this authority by proliferating levels of review and approval; if we deny him the dis-

cretion to react decisively to changing circumstances; if we do not assure his effective control over resources required, we have doomed the project from the outset.

Second, there is the question of capability. Instinctive management ability can be enhanced by formal training—but there is no substitution for well-rounded experience. Those who exhibit an interest in and talent for project management must be developed through careful career planning.

Next, the issue of project management staffing. Project offices must be small and represent all relevant disciplines. If they become too large, direction becomes confused with execution.

Finally, the issue of visibility. While the project manager must have full authority, I believe in periodic progress reporting to higher management—both to review progress and problems from a broader perspective and to assess the relative strengths and weaknesses of emerging managerial talent. This is necessary within both the government and industry.

To achieve these ends, I have instituted a quarterly review of all major programs where progress will be analyzed and the program managers and their methods of operation compared.

#### CONTRACT FORM SHOULD BE CONSISTENT WITH INCURRED RISKS

DOD Directive 5000.1 simply states that the choice of contract type shall be consistent with the inherent risk involved. Risk, in my view, is an element which normally can and should be assessed prior to negotiations. Too often the tendency is to drive a contractor toward a more rigid form of contract than the situation—in terms of risk—merits. Therefore, we will work toward establishing a better balance between risk and contract type.

Our goal is to foster understanding rather than an adversary relationship between the Navy and the contractor. By understanding, I mean a businesslike relationship. Both the industrial manager and the Navy manager have a responsibility to their own organizations, and the differentiation between the two should be carefully recognized and controlled by the contract. But they have a mutual responsibility to get the job done, and this must be done in an atmosphere of clear understanding and cooperation. This atmosphere is seriously endangered when the relationship is marred by constant bickering.

#### AWARDS SHOULD BE MADE ONLY TO CONTRACTORS WHO MAKE FIRM COMMITMENTS

First, I believe we should foster a higher measure of integrity in the initial proposals we receive from industry. The seller should make a firm and final commitment to the job in his initial proposal and not bank on the strategy of playing his best cards later.

Second, we need to improve our ability to foster real competition without creating auctions. Too often, our well-informed emphasis on competition has led to underpriced contracts. We have awarded contracts at prices below our own cost estimate or should-cost estimates, and well below other bidders. The bidder either did not understand the job or took unwarranted risk. This has proven bad for both the

contractor and the Government. We want a company's lowest supportable bid achieved by management innovation.

An approach to this goal has already been roughed out. When price reductions are offered during negotiations or the initial bid is inconsistent with our independent cost estimate, the contractor will be required to provide an explanation for the reduction or inconsistency. Supportable justification must be available, including management decision by the contractor to share costs—if that was the reason. If this explanation is not satisfactory, we may conclude the contractor does not understand the program, and his proposal will be judged accordingly.

#### EMPHASIZE CONTRACTOR'S TRACK RECORD IN AWARD PROCESS

Third, I think we should be placing more emphasis on a prospective contractor's record as a manager. I do not think we are placing enough emphasis on his past performance in terms of ability to control costs, to deliver on time, and deliver equipment which conforms to the contract.

What a contractor has been able to achieve previously is probably the best measure we have of whether or not he can do what he promises in his current proposal.

My final objective in this area is to review our pricing policy for fixed-price-type contracts. My concern is that we are attempting to price some elements of cost risk—such as general economic trends—which are beyond the control of the Navy and the contractor and therefore, cannot be forecast with a reasonable degree of accuracy. Our business, which frequently is pushing the state of the art, has enough unknowns. In some areas, we have used contract clauses which are designed to provide for the upward and downward revision of the contract price, based upon the changes in economic factors. My intention is to foster improvement in both their coverage and means of application to make their use more effective.

I will also solicit congressional understanding and recognition of this area. All too often cost growth related to these areas, even if properly covered in the contract, is lumped together with other cost growth elements and the total is cited as an example of mismanagement. Also when the Navy, OSD, or the Congress decides to stretch out programs, the inevitable cost growth is blamed on the manager. I want to make sure the manager is held to account for those areas he can control and that there be intelligent understanding of the areas that are beyond his control.

#### PROGRAM EXECUTION : CONVERT REQUIREMENTS INTO REALITY

In the area of program execution, I plan to concentrate on a means to measure progress toward converting the contractual performance, cost and schedule requirements into reality.

I believe this can best be achieved by adherence to the cost and schedule control philosophy contained in DOD instruction 7000.2. This involves careful development of a good work breakdown structure, budgeting labor and material expenditures in manageable work packages, and by reporting progress within this same framework. When

properly implemented, we will have a system that starts a program with a well understood baseline. Program managers in industry and Navy will receive identical progress data on a day-to-day basis. We will know what work has been authorized, together with authorized changes. Areas of previous misunderstanding will be eliminated and many claim sources avoided.

We have implemented 7000.2 in roughly a dozen programs and plan to approximately double that inclusion by the end of calendar year 1974—with heavy emphasis on the shipbuilding industry.

Design to cost is going to make a big contribution. Up to now it has been in the process of evolution. Different people have understood it to mean different things. However, some effective demonstrations have already been initiated wherein cost has been established as a design parameter on an equal basis with performance. This concept acts as a discipline for the contractor, but the Navy must also be prepared to review performance requirements when cost increases are indicated.

#### GENUINE COST CONTROL THROUGH BETTER PROJECT MANAGEMENT

In summary, our approach is based on better managers and management systems—both in industry and Government. We can only achieve genuine cost control through better project management.

Now, I would like to turn to several areas of interest that are primarily Navy matters.

#### USE, BUILD, AND CHARTER METHOD AFTER CONGRESSIONAL APPROVAL

First, I will address the question of the Navy's new build and charter program for tankers.

During the late 1960's it was becoming increasingly apparent that a problem of major proportions was developing with respect to our ability to move petroleum. Simply stated, there were only a limited number of small tankers in the U.S. merchant marine available for charter to meet our needs. In addition, many of these tankers were of the World War II variety and were being replaced with much larger—100,000 deadweight tons and above—tankers. These larger ships did not serve the Navy's needs due to our need to operate frequently in other than deepwater ports. Our studies revealed that in order to meet future petroleum sealift requirements, a relatively small tanker—25,000 deadweight tons—would be needed. Therefore, the Navy is acquiring the services of nine such tankers by build and charter. We believe this is a cost effective method of acquiring commercial ships and provides the Government a means of convenient financing. This arrangement appears desirable for similar future Military Sealift Command requirements for special purpose ships. I am aware that the General Accounting Office has reviewed this method of acquisition and recommends that congressional authority be secured in the future. Therefore, legislation to formalize this method of meeting requirements is in preparation and will be forwarded to the Congress in the near future.

## NAVY USES "MINI" SHOULD-COST INSTEAD OF COMPREHENSIVE FORM

Now, I would like to comment on Navy policy with respect to should cost. I believe there has been a tendency to confuse specialized should-cost studies with more traditional should-cost techniques.

Should-cost negotiating techniques involve the combined efforts of the Government's normal contract team to analyze the elements of a contractor's proposal in terms of what each element "should" cost as opposed to what the contractor says it will cost. Our negotiating teams are constantly employing should-cost techniques where doubt exists as to the reasonableness of individual cost elements, and we encourage these so-called mini should-cost efforts.

On the other hand, classic should-cost studies, as you know, involve a larger group of specialists over a significant length of time. Their efforts are normally directed at all aspects of the contractor's proposed plan to produce the item and his proposed price or cost to produce according to that plan.

In those instances where we cannot rely on competition, we must then make a choice between a full should-cost study, or reliance on should-cost pricing techniques applied to areas of the contractor's proposal which have questionable validity. I recognize that the Navy has completed only a small number of the comprehensive in-depth should-cost studies. However, the Navy has employed the mini should-cost technique, and we plan to increase the number of these reviews. We will also make selected in-depth should-cost reviews where appropriate.

Mr. Chairman, that concludes my oral statement. I will be happy to answer any questions that you or your subcommittee may have at this time.

[The prepared statement of Mr. Bowers follows:]

## PREPARED STATEMENT OF HON. JACK L. BOWERS

Mr. Chairman, I appreciate the opportunity to appear before your committee to discuss Navy weapon system acquisition with you. Mr. Mendolia has covered the broad policy aspects of most of the issues you specified. I will elaborate on those that are primarily of Navy interest.

As you know, this is my first opportunity to present my views to your committee since becoming the Assistant Secretary of the Navy for Installations and Logistics. My decision to accept this position was heavily influenced by the importance I attach to national defense and a strong belief that my some 27 years on the industry side of the defense business would permit me to make a genuine contribution to major weapon system acquisition. So, if I may, and since I am relatively new, I would like to give you a broad outline of my plans.

First, let me stress that I am convinced we have the necessary technology to provide for our defense. Sometimes we are criticized for too much gold-plating. This has been true in some instances. In our enthusiasm to correct that problem, however, we should not fail to take advantage of the opportunities where technology can do jobs with much fewer men and equipment. But the bigger challenge lies in translating our technology into defense systems on an orderly basis, and that means lower cost and no mistakes.

We have made a great deal of progress in the last 10 years, but occasional failures in the acquisition process have continued. I think that is because you and we have concentrated on the contract form as the perennial villain. Problems have been ascribed to CPFF, total package procurement and fixed price contract forms, and we seem to always think a change in this area is the answer. However, under each contract era, problems have continued to crop up. That should tell us something.

I believe the basic issue is one of management. Therefore, it is my intention to concentrate on improving Navy management of the defense systems acquisition process.

The challenge as I see it is to develop tools to keep the manager in control of the process—rather than inventing tools to control the manager.

I will discuss four areas where my Office has set specific goals. These are headed by management and followed in proper perspective by contract form, the award process, and program execution.

#### MANAGEMENT

In the management area, I want to emphasize project management authority. The manager must be in full control. If we dilute his authority by proliferating levels of review and approval; if we deny him the discretion to react decisively to changing circumstances if we do not assure his effective control over resources required, we have doomed the project from the outset.

Second, there is the question of capability. Instinctive management ability can be enhanced by formal training—but there is no substitution for well rounded experience. Those who exhibit an interest in and talent for project management must be developed through careful career planning.

Next, the issue of project management staffing. Project offices must be small and represent all relevant disciplines. If they become too large, direction becomes confused with execution.

Finally, the issue of visibility. While the project manager must have full authority, I believe in periodic progress reporting to higher management—both to review progress and problems from a broader perspective and to assess the relative strengths and weaknesses of emerging managerial talent. This is necessary within the government and industry.

To achieve these ends, I have instituted a quarterly review of all major programs where progress will be analyzed and the program managers and their methods of operation compared.

#### CONTRACT FORM

Now I would like to turn to the subject of contract form—the selection of the proper contract for a given task.

DOD directive 5000.1 simply states that the choice of contract type shall be consistent with the inherent risk involved. Risk, in my view, is an element which normally can and should be assessed prior to negotiations. Too often the tendency is to drive a contractor toward a more rigid form of contract than the situation—in terms of risk—merits. Therefore, we will work toward establishing a better balance between risk and contract type.

Our goal is to foster understanding rather than an adversary relationship between the Navy and the contractor. By understanding, I mean a businesslike relationship. Both the industrial manager and the Navy manager have a responsibility to their own organizations, and that differentiation between the two should be carefully recognized and controlled by the contract. But they have a mutual responsibility to get the job done, and this must be done in an atmosphere of clear understanding and cooperation. This atmosphere is seriously endangered when the relationship is marred by constant bickering.

#### AWARD PROCESS

We are also directing our attention toward some specific areas within the broader framework of the award process.

First, I believe we should foster a higher measure of integrity in the initial proposals we receive from industry. The seller should make a firm and final commitment to the job in his initial proposal and not bank on the strategy of playing his best cards later.

Second, we need to improve our ability to foster real competition without creating auctions. Too often, our well intentioned emphasis on competition has led to underestimated programs. We have awarded contracts at prices below our own cost estimate and well below other bidders. The bidder didn't understand the job or took unwarranted risk. This has proven bad for both the contractor and the government. We want a company's lowest supportable bid achieved by management innovation.

An approach to this goal has already been roughed out. When price reductions are offered during negotiation or the initial bid is inconsistent with our independent cost estimate, the contractor will be required to provide an explanation for the reduction or inconsistency. Supportable justification must be available, including management decision by the contractor to share costs (if that was the reason). If this explanation is not satisfactory, we may conclude the contractor does not understand the program, and his proposal will be judged accordingly.

Third, I think we should be placing more emphasis on a prospective contractor's record as a manager. I do not think we're placing enough emphasis on his past performance in terms of ability to control costs, to deliver on time, and deliver equipment which conforms to the contract specifications. What a contractor has been able to achieve previously is probably the best measure we have of whether or not he can do what he promises in his current proposal. To guard against programs won by proposal brochuremanship, we are considering requiring all promises to be accompanied by solid evidence of past accomplishments.

My final objective in the acquisition area is to review our pricing policy for fixed-price type contracts. My concern is that we are attempting to price some elements of cost risk—such as general economic trends—which are beyond the control of the Navy and the contractor and therefore cannot be forecast with a reasonable degree of accuracy. Our business, which frequently is pushing the state of the art, has enough unknowns. In some areas, we have used contract clauses which are designed to provide for the upward and downward revision of the contract price, based upon the changes in economic factors. My intention is to foster improvement in both their coverage and means of application to make their use more effective.

I will also solicit congressional understanding and recognition of this area. All too often cost growth related to these areas, even if properly covered in the contract, are lumped together and cited as examples of mismanagement. Also when the Navy, OSD, or the Congress decides to stretch out programs, the inevitable cost growth is blamed on the manager. I want to make sure the manager is held to account for those areas he can control and that there be intelligent understanding of the areas that are beyond his control.

#### PROGRAM EXECUTION

In the area of program execution, I plan to concentrate on a means to measure progress toward converting the contractual performance, cost and schedule requirements into reality. I consider this to be a shared responsibility between industry and our Navy managers.

I believe this can best be achieved by adherence to the cost and schedule control philosophy contained in DOD Instruction 7000.2. This involves careful development of a good work breakdown structure, budgeting labor and material expenditures in manageable work packages, and by reporting progress within this same framework. When properly implemented, we will have a system that starts a program with a well understood baseline. Program managers in industry and navy will receive identical progress data on a day-to-day basis. We will know what work has been authorized, together with authorized changes. Areas of previous misunderstanding will be eliminated and many claim sources avoided.

We have implemented 7000.2 in roughly a dozen programs and plan to approximately double that inclusion by the end of calendar year 1974—with heavy emphasis on the shipbuilding industry.

Design to cost is going to make a big contribution. Up to now it has been in the process of evolution. Different people have understood it to mean different things. However, some effective demonstrations have already been initiated wherein cost has been established as a design parameter on an equal basis with performance. This concept acts as a discipline for the contractor, but the Navy must also be prepared to review performance requirements when cost increases are indicated.

In summary, our approach is based on better managers and management systems—both in industry and Government. We can only achieve genuine cost control through better project management. This means we must somehow focus on the right issues—basic issues—at the right time during a program's life cycle. Much progress has been made during recent years, but I believe that there is much more that can be done.

Now I would like to turn to several areas of interest to the committee that are primarily Navy matters.

#### BUILD AND CHARTER

First, I will address the question of the Navy's new build and charter program for tankers.

During the late 1960's it was becoming increasingly apparent that a problem of major proportions was developing with respect to our ability to move POL. Simply stated, there were only a limited number of small tankers in the U.S. Merchant Marine available for charter to meet our needs. In addition, many of these tankers were of the World War II variety and were being replaced with much larger (100,000 dwt and above) tankers. These larger ships did not serve the Navy's needs due to our need to operate frequently in other than deep water ports. Our studies revealed that in order to meet future POL sealift requirements, a relatively small tanker (25,000 dwt) would be needed. Therefore, the Navy is acquiring the services of 9 such tankers by build and charter. We believe this is a cost effective method of acquiring commercial ships and provides the Government a means of convenient financing. This arrangement appears desirable for similar future military sealift command requirements for special purpose ships. I am aware that the General Accounting Office has reviewed this method of acquisition and recommends that congressional authority be secured in the future. Legislation to formalize this method of meeting requirements is in preparation and will be forwarded to the Congress in the near future.

#### CLAIMS

You are aware of the claims problem we have encountered in some of the Navy's past programs. We have provided you a considerable amount of detailed information on this subject in the past. We have come a long way in dealing with claims over the last two years. Under the leadership of the claims board, the commands are doing a better job of evaluating claim submissions. We are rejecting claims submitted on a total cost basis and are concentrating our efforts on the evaluation of those claims that are properly stated and supported. The treatment of claims is getting higher priority and additional resources. I can assure you that we recognize and accept the responsibility for mounting a vigorous defense on those claims which have become the source of litigation. The general counsel has established an appeals organization, and the commands involved are applying the necessary resources to support the litigation effort.

In discussing the things that we are doing to prevent claims, I think it is useful to look at the problem in terms of the basic deficiencies reflected by the things we see cited as the basis for claims.

Many of the causes relate to planning. We must plan our programs so that they can be executed in a rational and deliberate manner. We have a proper planning framework in the policy changes instituted by Mr. Packard which stress avoiding unwarranted concurrency and require that all major programs be carefully reviewed at certain key points to be sure that their accomplishments warrant further commitment of funds. I am involved in this review process, and I plan to watch the development of plans to be sure that these policies are followed.

Some of the causes for claims reflect the use of contract types that were inappropriate under the circumstances. Where this was a matter of deliberate policy, such as in the case of total package procurement, the policies were changed to require that the type of contract be tailored to the conditions surrounding the procurement. The Navy is giving considerable emphasis to ensuring that our major systems contracts are made on a sound basis. In addition to our existing review of advance procurement plans and our business clearance process, we have instituted a procedure whereby the solicitations for all major system procurements are reviewed at the headquarters naval material command before their release to industry. These reviews ensure that the requirements, terms, and type of contract are consistent with policy and the approved program plans. I receive a briefing on each one of these reviews.

The last area is improved management, and I have already covered our plans in that regard.

#### SHOULD COST

Now I would like to comment on Navy policy with respect to should cost. I believe there has been a tendency to confuse specialized should cost studies with more traditional should cost techniques.

Should cost negotiating techniques involve the combined efforts of the Government's normal contract team to analyze the elements of a contractor's proposal in terms of what each element "should" cost as opposed to what the contractor says it will cost. Our negotiating teams are constantly employing should cost techniques where doubt exists as to the reasonableness of individual cost elements, and we encourage these so-called "mini" should cost efforts.

On the other hand, should cost studies—as you know—involve a larger group of specialists over a significant length of time. Their efforts are normally directed at all aspects of the contractor's proposed plan to produce the item and his proposed price or cost to produce according to that plan.

The decision to utilize either technique depends largely on the degree of competition involved. Neither approach is as necessary if the competitive element is sufficient to generate efficiency and a reasonable price.

In those instances where we cannot rely on competition, we must then make a choice between a full should cost study, or reliance on should cost pricing techniques applied to areas of the contractor's proposal which have questionable validity. I recognize that the Navy has compelled only a small number of the comprehensive in-depth should cost studies. However, the Navy has employed the mini should cost technique, and we plan to increase the number of these reviews. We will also make selected in-depth should cost reviews where appropriate.

#### PROGRESS PAYMENTS

I know that you are aware of the changes made in our procedures for making ordinary cost based progress payments. This was covered in Mr. Shillito's statement of last year.

The Navy had been making progress payments to shipbuilders for many years on the basis of the percentage of completion. We made a study of this process and found instances where our shipbuilders were being reimbursed in excess of incurred cost. This appeared to result for the most part from a lack of uniformity and precision in measuring physical progress. Consequently, we changed our procedures so that we will pay progress payments to shipbuilders on a basis similar to other contractors. In other words, we will use a recently approved cost based method.

In order to compensate for the long construction time for ships as compared to other hardware, and the concomitant high cost of investment, we have added a procedure by which we will periodically readjust the progress payments on an equitable basis. These payments will correspond to what other contractors normally receive for partial deliveries. We will require that appropriate physical progress be demonstrated before they are made. This procedure has been carefully designed to ensure that it will not result in overpayments since we want the contractors to have a reasonable level of their own investment in the work in process. This new approach may require some evolutionary development owing to differences in programs and contractors. Some exceptions and modifications may be necessary initially; however, we expect to move appropriately toward a firm improvement in this difficult area.

Mr. Chairman, that concludes my prepared statement.

#### DEFENSE DEPARTMENT LARGEST SINGLE OIL PURCHASER—ACCOUNTS FOR 10 PERCENT OF PRESENT SHORTAGE

Chairman PROXMIRE. Thank you very much, gentlemen.

As you know, the topic concerning us in the country and concerning the Senate is the energy shortage. And I would like to ask you a few questions about that before we get into some of the vital issues you have raised.

According to your press releases and announcements, the Department of Defense is now beginning to purchase 300,000 barrels of oil a day in the United States because of the closedown of foreign sources. Since the Defense Department already is the largest single purchaser of oil in this country, what impact will this additional 300,000 barrels a day have on the domestic economy?

Mr. MENDOLIA. That would account for approximately 1.8 percent of the total consumption of fuel in the United States.

Chairman PROXMIRE. And it would account for about 10 percent of the 3-million-barrel-a-day shortage that we have; is that right?

Mr. MENDOLIA. That is right.

Chairman PROXMIRE. Have you made any further analysis to determine any further economic effect that might have, other than that it would be a substantial percentage?

Mr. MENDOLIA. No; we are attempting to develop that. As you might expect, it is not a simple determination to calculate the effect on the overall economy. But we are attempting to do that, along with other agencies of the Government. But our principal efforts are directed at trying to reduce consumption.

Chairman PROXMIRE. Will you outline the steps you have taken?

#### STEPS TAKEN TO REDUCE DEFENSE DEPARTMENT OIL CONSUMPTION

Mr. MENDOLIA. Some of the steps that we have taken are: Reduced aircraft flying hours by about 18 percent; reduced steaming time of Navy ships by about 20 percent; and we have directed the 158,000 or so vehicles that are under DOD guidance to follow a maximum speed limit of 50 miles an hour. That represents what I would call a sampling of perhaps 40 or 50 recommendations which are designed immediately to curtail fuel consumption. Further, we have an Energy Task Group in being which is examining all feasible alternatives to conserve fuel and energy.

Chairman PROXMIRE. How much of an overall cutback do you estimate that this will result in in your consumption?

Mr. MENDOLIA. My current view is that in fiscal year 1974, versus fiscal year 1973, our reduction in consumption will be a minimum of 14 percent. We are seeking larger cutbacks than that.

Chairman PROXMIRE. It will be a reduction of how much again?

Mr. MENDOLIA. Fourteen percent.

Chairman PROXMIRE. Can you give us the dollar amount that you intend to buy?

Mr. MENDOLIA. The forecast dollar amount for the fiscal year 1974 is estimated to be about \$2½ billion, which is up about \$900 million from 1973, despite a reduction in consumption from about 750,000 barrels a day to about 650,000.

Chairman PROXMIRE. How much of a price increase does this represent?

#### DOD PAYS 40 PERCENT TO 50 PERCENT MORE FOR OIL—CONSUMES A BILLION MORE IN DOLLAR COST

Mr. MENDOLIA. It represents a price increase probably in the neighborhood of 40 to 50 percent.

Chairman PROXMIRE. That seems extraordinary. We have had big increases, of course, at the consumer level, but nothing like that.

Mr. MENDOLIA. Yes. That comes about from a fairly easily recognized economic fact. DOD was buying prior to this year in a market where supply was in excess of demand, and we bought at prices substantially below market. Beginning this year we are unable to buy our material, and we also were caught by the price freezes. The net result

is that when we were finally able to cover our requirements, our prices moved up to essentially list price.

Chairman PROXMIRE. What is the difference in price again, the overall cost again?

Mr. MENDOLIA. The difference this year versus last is an increase of about \$900 million on less physical consumption.

Chairman PROXMIRE. So you are going to consume almost a billion dollars more in dollar cost?

Mr. MENDOLIA. That is right.

Mr. BOWERS. Mr. Chairman, also the Navy has introduced legislation in both the House and the Senate to recommend the opening of the naval petroleum reserves at Elk Hills, Calif., to offset this increased demand on the economic market.

Chairman PROXMIRE. Mr. Mendolia, have you considered canceling the aerial demonstration flights of the flying teams such as the Thunderbirds which have seven shows planned for November?

Mr. MENDOLIA. Yes, we have. My understanding is that five have been canceled, and I am sure the other two are under consideration.

Chairman PROXMIRE. Under consideration. When will that decision be made?

Mr. MENDOLIA. That is as of yesterday. Obviously, those are being considered by the Air Force, and I would presume they will come to a decision promptly.

#### MENDOLIA DRIVEN TO WORK IN CHAUFFEUR-DRIVEN LIMOUSINE

Chairman PROXMIRE. Can you tell us how you got to work yesterday and today and how you usually get to work?

Mr. MENDOLIA. Yes. I think it is noted in the newspaper yesterday that I came to work in my medium-sized Chrysler, which I will not have on Monday of next week. I will have a smaller car, probably a Plymouth.

Chairman PROXMIRE. Was it a government car driven by a chauffeur?

Mr. MENDOLIA. That is right.

Chairman PROXMIRE. Will the smaller Plymouth be driven by a chauffeur?

Mr. MENDOLIA. Yes, it will.

Chairman PROXMIRE. But the gas consumption will be saved, and you will be driving in a Plymouth limousine instead of a Chrysler?

Mr. MENDOLIA. I hope so.

Chairman PROXMIRE. I understand that you have been recently named Chairman of the Defense Energy Council. As you know, the public is being asked and will probably be required to make personal sacrifices to meet the energy crisis. Do you believe that persons in high and privileged positions of authority like yourself ought to make similar sacrifices?

Mr. MENDOLIA. Undoubtedly.

#### DISCONTINUED USE OF CHAUFFEUR-DRIVEN GOVERNMENT CARS—AN IMPORTANT SYMBOL

Chairman PROXMIRE. Do you think being driven to work represents that much of a sacrifice?

Mr. MENDOLIA. I would be glad to walk to work if others will make comparable sacrifices.

Chairman PROXMIRE. Run with me.

Mr. MENDOLIA. I would be delighted.

Chairman PROXMIRE. I am sure that you expect the public is going to have to make extreme sacrifices. For instance, I read the other day in the newspaper that if the shortage in gasoline is translated into a reduction in the availability of gasoline to consumers, that it would mean that the average consumption of about 14 gallons a week will have to be reduced to about 10 gallons. Now, that means that many people will have to drive in carpools and many will have to use buses and public transportation, or find other ways, and maybe some will walk. And I realize that in national terms the saving you and other top officials could make is not significant, but the symbol is enormously important. Because you are the top man in this respect, as Chairman of the Defense Energy Council.

You say you intend to give up your chauffeured limosine if others do?

Mr. MENDOLIA. I would be delighted.

Chairman PROXMIRE. Well, maybe we can help you along in the Senate today. We have an amendment that would do that.

Mr. MENDOLIA. That is what I understood.

Chairman PROXMIRE. Mr. Bowers, can you tell us how you got to work yesterday and today, and whether, if you do use a chauffeured limousine, you will give it up?

Mr. BOWERS. I do have the low end of the Chrysler line. In my case—

Chairman PROXMIRE. I did not know that there was a low end of the Chrysler.

Mr. BOWERS. I think the engine and body are in the Chevrolet and Plymouth area.

In my case I am going to make a very sober and considered judgment that it does increase the efficiency of my operation. My offices are in Crystal Plaza, as opposed to the Pentagon, and I go back and forth several times a day. I believe my secretary and others would assure you that I allow about 8 minutes for each trip. In addition, there are trips to the Hill very frequently. It would add considerably to the length of these trips if I depended on other transportation. So I believe that even from a cold, hard analytical consideration I could personally make a case for having some help in driving. I would not mind using my own car, but the driver is a great help.

Chairman PROXMIRE. My first question was on your getting to work, not driving.

Mr. BOWERS. Yes, of course.

Chairman PROXMIRE. Would you, under those circumstances, drive yourself to work?

Mr. BOWERS. Of course.

Chairman PROXMIRE. And you would be willing to use your own car, but to have assistance from somebody to help drive you so that you could work while you are in your car?

Mr. BOWERS. Yes, sir.

## WILL DOD CUT BACK ON THE USE OF CHAUFFEUR-DRIVEN AUTOMOBILES?

Chairman PROXMIRE. That is reasonable.

Let me ask you further, Mr. Mendolia, because of your position you not only have discussion as to your own limousine and how you get to work, but have you considered cutting back on the use of the 45 chauffeured limousines on standby by the high ranking civilians in the Pentagon?

Mr. MENDOLIA. That has been under study for some time, and I expect a decision momentarily. That might be today. I cannot speak for Secretary Schlesinger, but that is a subject in my group of studies and my recommendations before the Secretary.

Chairman PROXMIRE. What is your recommendation?

Mr. MENDOLIA. Well, literally, that we move down the size of cars. The bulk of those who now have authority—

Chairman PROXMIRE. Is there a possibility that the Secretary may consider eliminating the use of limousines, at least for getting high ranking officials to work?

Mr. MENDOLIA. If you mean by limousines, the official definition of limousine—which is Cadillacs, I understand?

Chairman PROXMIRE. No, just let them go to work in their own cars.

Mr. MENDOLIA. That stage has not been reached in our consideration.

Chairman PROXMIRE. Is that a sacrifice to be considered too extreme?

Mr. MENDOLIA. I would not put it in that context.

## CUTBACK ON HELICOPTER USE IN THE WASHINGTON AREA

Chairman PROXMIRE. I am sure you would not.

Have you considered cutting back on the 62 helicopters stationed in the Washington, D.C., area, that transport Defense officials?

Mr. MENDOLIA. We have not looked at that specifically, but obviously that is in an area that will come under consideration just to conserve energy. We are looking at every piece of mobile equipment—

Chairman PROXMIRE. You say you have not looked at it?

Mr. MENDOLIA. I cannot say as to that specifically. We are looking at all mobile equipment, whether helicopters or mission aircraft, to determine how we can effectively conserve energy.

Chairman PROXMIRE. When do you expect to have some kind of decision on that?

Mr. MENDOLIA. I cannot speak specifically but I presume within the next month or so. We are looking at the whole problem broadly, and we have asked the services to look at all opportunities to conserve, symbolic and substantive.

Chairman PROXMIRE. Yesterday we had a vote in the Senate, and it was a fairly close vote, 47 to 40, when the Senate decided not to mandate gasoline rationing by January 15, which is only 2 months away. Now, the Senate may change its mind on that, and the House might decide to go ahead and provide that, and the President may decide to do it. Under those circumstances it would seem to me that to take a month or so is kind of a leisurely way to look at something in which the Defense Department could decide now within the hour to reduce the 62 helicopters available to transport Defense officials.

Mr. MENDOLIA. I am sure you would like to have Secretary Bowers and me approach any problem in an orderly and methodical way. I could respond and say I am going to have that answer tomorrow. We are trying to look at the total context of energy consumption, and that involves a considerable number of people. I cannot predict when I am going to get an answer for any specific item. We are going to move with all due speed, recognizing that, invoking the Defense Procurement Act, it is incumbent on the Department of Defense to utilize its energy in the most effective manner possible. And that is what I intend to do.

Chairman PROXMIRE. You have already indicated that you expect to place substantial constraints on the use of energy by the Air Force around the world.

Mr. MENDOLIA. That is right.

#### WILL DOD REDUCE USE OF COMMAND AND SUPPORT AIRCRAFT?

Chairman PROXMIRE. Let me be precise and specific about that.

Have you considered placing constraints on the 178 command and support aircraft stationed worldwide that are frequently used by local base commanders as their personal aircraft? I am speaking of the kind of plane that Gen. Jack Catton of the Air Force Logistics Command recently remodeled to the tune of \$670,000?

Mr. MENDOLIA. As a member of the corporate hierarchy of DOD, my function is to establish policy. And that policy is to conserve energy. It is up to the services to determine how best they are going to effectuate that policy. Whether the Air Force chooses to stand down that particular plane, I think, is a judgment that should be made by the Air Force, and that recommendation made to us.

Chairman PROXMIRE. Can you not exert some influence? After all, this is something that does set an example for the Air Force, and for the country. And I would think that within the Air Force the morale would be far better if the planes used for the personal use of commanders would serve as an example of real restraint and sacrifice.

Mr. MENDOLIA. I cannot speak definitely of that particular plane, but my understanding is that that plane is not used personally. It is used by General Catton in the carrying out of his duties. He has a worldwide responsibility, and I will presume he will use his good judgment as to whether that is symbolic, or whether he needs that plane for his responsibilities, which I think are considerable.

Chairman PROXMIRE. Have you placed limitations on the Navy using a handful of aircraft to fly midshipmen to football games around the country? I understand they went to Tulane last weekend and have plans for Georgia Tech this week.

Mr. MENDOLIA. That action has been canceled for the Georgia Tech game. My understanding is that there will be a plane that will carry the band only, students will hitchhike or get there however they choose. That is their decision to make.

Chairman PROXMIRE. But you have canceled—

Mr. MENDOLIA. The Navy has done that.

Chairman PROXMIRE. The Navy has canceled the additional planes that they have to fly the student body?

Mr. MENDOLIA. Yes.

## MILITARY SHOULD USE COMMERCIAL FLIGHTS MORE OFTEN

Chairman PROXMIRE. Would you consider placing restrictions on round the world inspection trips by high ranking officers?

Mr. MENDOLIA. If the inspection trips are designed to accomplish some of the tasks that we have—for instance, underway right now is an investigation which is to determine where we are consuming energy, and are we consuming it effectively?—my view is that it should be up to the good judgment of high ranking officials to determine whether—

Chairman PROXMIRE. Would you encourage them to use commercial aircraft? Sometimes you can, I know.

Mr. MENDOLIA. Wherever it is possible.

Chairman PROXMIRE. Stress it hard, because it would seem to me that there are many areas where commercial aircraft could be used. And obviously, then, there is no additional use of fuel.

Mr. MENDOLIA. That has been done at the highest level at the Department of Defense. I gave a briefing on this subject a week ago, and it was stressed that it is desirable for the Department of Defense, for the reasons you mentioned, to conserve energy, to use commercial aircraft wherever feasible. And that is the policy.

## LEGAL ACTIONS AGAINST CONTRACTORS WHO SUBMIT GROSSLY INFLATED CLAIMS

Chairman PROXMIRE. Mr. Bowers, let me get in something else quickly.

There have been several instances of contractors in financial difficulties submitting grossly inflated claims against the Navy. When the claim is evaluated it turns out the Navy owes only a small percentage of the claim, according to some recent determinations in cases that have received some public attention. Congress has passed laws making it a criminal offense to submit false claims to the Government. Has the Navy ever attempted to bring legal action against contractors who submit grossly inflated claims?

Mr. BOWERS. Whenever we have suspected this we have submitted it to the Justice Department.

Chairman PROXMIRE. Can you give us the name of cases where this has been done, where there has been a referral to the Justice Department?

Mr. BOWERS. I would like Mr. Lewis to answer that.

Chairman PROXMIRE. Mr. Lewis.

Mr. LEWIS. Mr. Chairman, I was appointed General Counsel of the Navy approximately 3 months ago, and during this time I do not know of any claims. However, at the present time we have before us the allegations in the *680 submarine* case. And we are now—

Chairman PROXMIRE. That is the *Litton* case?

Mr. LEWIS. This is the *Litton* case. And our standard of judgment in that matter is not to determine if fraud has been committed. Our only standard is to determine if there is enough material there to warrant the submission to the Department of Justice, which as you know, is the expert in this area. We are not. And that is what we are presently considering. I would anticipate a decision within the next couple of weeks on this matter.

Chairman PROXMIRE. You search your files and give us the names of any other cases that have been certified to the Department of Justice by the Navy in the last several years.

Mr. LEWIS. I will be pleased to do so.

[The following information was subsequently supplied for the record:]

From 1971 to date, the Navy Office of the General Counsel has communicated with the Department of Justice with respect to approximately 30 matters involving alleged fraud pertaining to Navy contracts. Also, Navy Investigative Service statistics available from January 1972 to September 1973 indicate that NIS referred to the Federal Bureau of Investigation 172 "fraud and related cases," 35 of which pertained to procurement fraud.

#### DOES THE NAVY FAIL TO ENFORCE THE LAW?

Chairman PROXMIRE. Mr. Bowers, do you believe a contractor can submit a claim inflated by a factor of 10 or 20 and not violate the laws prohibiting false claims? Are additional laws necessary or is the Navy simply failing to enforce the laws on the books?

Mr. BOWERS. I do not think we are failing to enforce the laws. I would have to look at each individual case on its merits.

Chairman PROXMIRE. Would you not regard a claim that is 10 or 20 times as large, as it turned out to be, as something that certainly invited very careful scrutiny, and a suspicion that it might well be a false claim?

Mr. BOWERS. When we receive it we do not know that it is 10 to 20 times as large. It is only after we examine it, after the facts are in, that we can learn why it was large. At that time we can make a judgment.

#### LITTON OVERPAID BY \$7.5 MILLION ON NEW SUBMARINE

Chairman PROXMIRE. Last year we examined progress payments and certain defense contracts and learned that Litton had been overpaid on its new submarine construction contract up to \$7,590,000. Has the Navy investigated the cases of the overpayments, and if so, is there any indication of wrongdoing on the part of the contractor or Navy officials in connection with the overpayments?

Mr. BOWERS. Well, that has been addressed in Mr. Mendolia's statement about our approach to new methods for progress payments. We do agree that the policies of the past have occasionally resulted in a temporary—

Chairman PROXMIRE. I am talking about in this particular case.

Mr. BOWERS. I am not acquainted with this particular one. I think I would have to provide detailed information on that one. I think it is covered with the general comment about the—

Chairman PROXMIRE. Are you not aware of the situation with that very large overpayment?

Mr. BOWERS. The \$7½ million on which contract?

Chairman PROXMIRE. That was the payment to Litton on its new submarine construction work.

Admiral WOODFIN. I can talk to that.

Chairman PROXMIRE. Yes, Admiral.

Admiral WOODFIN. There was a problem of over-progressing, as I recall, in the 680 contract. To my memory, I do not remember the specific number, but I do remember that there was a refund that was

obtained, or taken back from the company, when it was determined that there had been over-progressing. I think one of the things that Mr. Bowers just said is relevant to the policy issue because the problem gets into the matter of determining physical progress versus cost incurred. The new policy he speaks of is more related to the cost incurred system, which I think is a lot more valid system than a somewhat subjective judgment as to physical progress. I believe this matter has been squared away by a series of refunds and recomputations of physical progress.

Chairman PROXMIRE. Last December Mr. Mendolia's predecessor, Barry Shillito, told this subcommittee that he had not seen anything to indicate fraud in Litton's claims. Yet, we had learned that the Navy was already investigating the possibility that false and misleading information was submitted by Litton in their nuclear submarine claim. Can you tell us the original amount of the claim and the amount the Navy has offered to pay after evaluating it?

Mr. BOWERS. That is the claim Mr. Lewis was discussing a moment ago.

POSSIBLE FRAUD IN THE LITTON 680 SUBMARINE CLAIMS CASE

Chairman PROXMIRE. On what date did the Navy begin its investigation into possible fraud in this case?

Mr. BOWERS. Mr. Lewis, can you answer that?

Chairman PROXMIRE. Will you give us the amounts to what we asked for?

Mr. LEWIS. Yes.

Chairman PROXMIRE. The original amount and then the amount—

Mr. BOWERS. The latest adjusted claim amount on the 680 is \$31.2 million.

Chairman PROXMIRE. What was the original amount first?

Mr. BOWERS. I do not have that. I will submit that for the record.

Chairman PROXMIRE. Mr. Lewis, do you have that?

Mr. LEWIS. No, I do not. The claim you are speaking about, is that the claim that has been filed before the Board?

Chairman PROXMIRE. Yes. Admiral Woodfin, perhaps you have that.

Admiral WOODFIN. I was checking to see if I had the number, Senator. There was a higher number, and it was reduced in a subsequent submission by the contractor. As I recall, in think there was about a \$10 million reduction at one stage of the game. I think it was up to about 40 at one time and they dropped down to the 30 number that the Secretary just mentioned.

There were several iterations in that claim process. But we can provide that for the record.

Chairman PROXMIRE. All right.

[The following information was subsequently supplied for the record:]

The original claim on the 680/682/683 contract was submitted in November 1970 for \$31.5 million. It was based primarily upon the alleged late delivery of Government Furnished Material. The claim was subsequently revised as follows:

February 1971, increased, \$2.7 million.

December 1971, increased, \$9.2 million.

May 1972, decreased, \$6.4 million.

September 1973, increased, \$7.6 million.

September 1973, decreased, \$13.4 million.

The reasons given for these increases and decreases varied, but included recomputation of labor rates, escalation revisions, and changes to amounts claimed for interest and profit. A Contracting Officer's decision was rendered 31 July 1972 for \$6.8 million. The present claimed amount before the Armed Services Board of Contract Appeals is \$31.2 million.

#### PUFFING VERSUS FRAUD: IMPRECISION IN THE CLAIMS PROCESS

Mr. LEWIS. May I just point out, one of the problems that you deal with in this area, of course, is puffing versus a fraudulent claim, when it goes before the Board. As you probably are aware, most claims attorneys always tend to overstate their case when they file a complaint. When is that out of bounds, shall I say, is really the question here. And some of these claims that you have mentioned—

Chairman PROXMIRE. What we are talking about, Mr. Lewis, is there not a law which simply makes it illegal to file any kind of false information on a claim, anything specific like that? It is one thing to overestimate the damage, perhaps, or some element involved, or something else that is false information.

Mr. LEWIS. I agree with what you say. But my point is that some of the damages are subjective to a certain extent. And this tends to not allow as much precision as we would like to see.

Chairman PROXMIRE. What date did the Navy begin its investigation into possible fraud in this case?

Mr. LEWIS. This came—

Mr. BOWERS. Over a year ago.

Mr. LEWIS. This came approximately a year ago to the Office of the General Counsel. And at that time—

Chairman PROXMIRE. Can you give us a date for the record? You say over a year ago? When was it by the month?

Mr. LEWIS. I would say approximately September. I could be wrong, though.

Mr. BOWERS. We will obtain a date for the record.

[The following information was subsequently supplied for the record:]

August 1972.

Chairman PROXMIRE. And was there a team set up to investigate that? And what was the date of that investigation again?

Mr. LEWIS. There was a team set up to investigate that. Basically, it was one of the attorneys in the Office of the General Counsel, who spent all his time on that matter—practically all his time.

Chairman PROXMIRE. Beginning when?

Mr. LEWIS. Probably beginning in October.

Chairman PROXMIRE. That was October a year ago?

Mr. LEWIS. Yes.

#### FRAUD REPORT ON THE LITTON CASE

Chairman PROXMIRE. So it was a little more than a year ago.

Mr. BOWERS, has a fraud report dealing with the Litton submarine claim been submitted to your office or other Navy officials?

Mr. BOWERS. The information has been forwarded to the Office of the General Counsel, and he is in consultation with the Secretary of the Navy.

Chairman PROXMIRE. When was it submitted and what are its findings and recommendations?

Mr. BOWERS. I have not personally reviewed the information.

Chairman PROXMIRE. Admiral Woodfin, could you tell us?

Admiral WOODFIN. I have not reviewed it either. It was referred to the General Counsel's Office. It did come to the Chief of Naval Material. However, it did not come to me, sir.

Chairman PROXMIRE. Is there anybody else here who could tell us what were the findings and recommendations of that?

#### NAVY WILL TAKE ACTION AGAINST LITTON AFTER RECOMMENDATIONS MADE

Mr. LEWIS. Senator, that, of course, is in my bailiwick. This is a matter that is being discussed with the Secretary of the Navy. At the present time, since he has to make the final policy decision here, I feel that perhaps indicating what those recommendations were might lessen his options.

Chairman PROXMIRE. And the Navy, I take it, will take actions subsequently on it?

Mr. LEWIS. Yes, sir.

Chairman PROXMIRE. When?

Mr. LEWIS. I would say within the next couple of weeks.

Chairman PROXMIRE. Do you know whether Litton is aware of the Navy investigation, and if Litton officials have seen the report and know its contents?

Mr. LEWIS. To the best of my understanding Litton is aware of the investigation, since it was made public in the beginning when the allegations were made. To the best of my knowledge—I am sure no one from Litton has seen the file of the investigation.

Chairman PROXMIRE. Is it not correct that in recent hearings before the Armed Services Board of Contract Appeals, where Litton is appealing the Navy's decision on the submarine claim, Litton's attorney indicated that he knew the fraud report had been completed and had been referred to senior Navy officials?

Mr. LEWIS. That is what I said. They know of the existence of the report of my office. They have through the discovery procedure before the Board, attempted to obtain this report, which, at the present time, they have been unsuccessful in doing. However, as I understand the trial judge has given Litton a copy of Admiral Rickover's report dated July 19, 1972, in this matter. And they have seen that.

Chairman PROXMIRE. What date was the report filed?

Mr. LEWIS. You mean the report—which report?

#### NAVY FRAUD REPORT NEVER FILED

Chairman PROXMIRE. The Navy report, on the fraud investigation.

Mr. LEWIS. It has never been filed. It has been given to me to review as the General Counsel.

Chairman PROXMIRE. What date was it given to you?

Mr. LEWIS. I would say approximately a month ago. It is a very large file. And I personally wanted to review it.

Chairman PROXMIRE. What day was it?

Mr. LEWIS. The exact day I do not know. My records would indicate.

Chairman PROXMIRE. Let me ask for the record—I think I have got-

ten the flavor of your answer but let me ask anyway. Is it true that the report concludes that there is evidence that Litton's claim was fraudulent, and recommends that it be referred to the Justice Department for further investigation?

Mr. LEWIS. I would rather not indicate that, Senator, because this is a matter, as I say, where the ultimate decision rests with the Secretary, and I think that is an internal report prepared—

Chairman PROXMIRE. Why does this take so long? It seems to me that this is a very serious and urgent case. He got the report in September. And it had been studied for many months before that.

Mr. LEWIS. It has taken us this long because of the lack of fact-finding ability that we have in the Office of General Counsel. The Department of Justice can certainly go into these areas through the FBI, which have, as you know, strong authority in the area of investigation. We lack that authority. And thus, most of our time is taken to develop these factual situations.

Chairman PROXMIRE. But, Mr. Lewis, you said that a team was set up more than a year ago, that a competent lawyer worked full time on it.

Mr. LEWIS. One attorney.

Chairman PROXMIRE. He spent full time on it. It seems to me that that is factfinding. Is it not now a matter of decision, and has not the gathering of facts been completed?

Mr. LEWIS. That is right. What is left is the decision. And that is why I say—

Chairman PROXMIRE. That is why it puzzles me as to why that should take so long, 2 months, and the facts are right before the decisionmaking official.

Mr. LEWIS. Because I think there is a question whether or not under the standard, as I say—the standard called for by the regulations is whether or not there is sufficient material here to send it to the Department of Justice. And that is the question we are looking into.

Chairman PROXMIRE. I realize that there is question, because that is the basis on which the decision is supposed to be made. But I understood—

Mr. LEWIS. But there is no more factfinding left.

#### LITTON CASE UNIQUE—NO OTHER FRAUD CASES UNDER INVESTIGATION

Chairman PROXMIRE. Let me ask this. Is the Navy investigating other claims, Mr. Bowers, or do you believe this problem is unique to this case?

Mr. BOWERS. I know of no others that we are currently examining on the basis of possible fraud.

#### LOCKHEED SHIPBUILDING—WITHHOLD INFORMATION AND OVERSTATE CLAIM

Chairman PROXMIRE. Are not there a similar set of circumstances in the Lockheed shipbuilding claim in the sense that the Navy's evaluation showed (a) Lockheed withheld information from the evaluating team and (b) the claim was worth only a small fraction of the amount the company originally demanded?

Mr. BOWERS. No, I think these cases are quite different. The Lockheed Co., has submitted at various times different amounts of data. We believe that there well may be sufficient data at Lockheed to provide a basis for a higher amount than the contracting officer was able to offer.

Chairman PROXMIRE. Did not the Navy withhold data for substantial periods of time?

Mr. BOWERS. I would like to put it in a differet context. It is to their advantage, in order to justify getting money from us, to provide us with sufficient substantiating detail. When we examined what they gave us they did not give us enough to justify a higher amount. So we have given them a contracting officer's decision which is much lower, to be sure. And we are, therefore, asking them to provide additional support for any higher amount. However, now, of course, it is before the Armed Services Board of Contract Appeals.

Chairman PROXMIRE. Can you tell us the original amount of the Lockheed claim and the amount the Navy has offered to pay on it?

Mr. BOWERS. In May 1971, the total claimed amount was \$139.6 million. There was a tentative settlement at one time in a gross sense at \$62 million, and a provisional price increase of \$49 million was made against that. Later, when we examined the total information provided us more thoroughly, we issued a final contracting officer's decision at \$6.8 million, and that is the action that Lockheed has referred to the Board of Contract Appeals.

Chairman PROXMIRE. Was not the original amount of the claim \$158 million?

Mr. BOWERS. There were claims against four contracts. And my figures here show \$139 million.

NAVY'S TENTATIVE SETTLEMENT WITH LOCKHEED INFLATED BY A FACTOR OF SEVEN—COSTS THE TAXPAYER INTEREST FOR 1½ YEARS ON \$40 MILLION

Chairman PROXMIRE. Whatever it was, \$158 or \$139 million, Admiral Sonenshein, you just said, did enter into a tentative settlement on this claim for \$62 million, and actually he paid out \$49 million?

Mr. BOWERS. That is correct.

Chairman PROXMIRE. Now, in view of the contracting officer's final decision, pointing out how little and inadequate Lockheed's supporting data was and how it denied the Navy access to data, don't you think it was strange that Admiral Sonenshein entered into that tentative settlement?

Mr. BOWERS. We made it very clear that that was a tentative decision. The current number reflects a more complete study of the facts, and we have revised our position to that amount.

Chairman PROXMIRE. But that is such a grossly inaccurate tentative decision, something like six times, more than that, seven times the amount that the Navy determined finally. Has the Navy gotten back any of the \$49 million that was given to Lockheed in provisional payments?

Mr. BOWERS. We deferred the recovery pending the outcome of Lockheed's appeal to the ASBCA.

Chairman PROXMIRE. Why?

Mr. BOWERS. We considered the total merits of the case. And as I told you, while we have made a decision at the lower level, we do believe Lockheed will be able to support a larger amount. On that basis we deferred recovery.

Chairman PROXMIRE. Does this mean that the decision by Admiral Sonenshein cost the Navy and the taxpayers a very substantial amount of money, at least, in the interest payments on this very large amount?

Mr. BOWERS. No, it does not mean that. The final judgment will be made by the Armed Services Board of Contract Appeals. At that time, should the final decision be at a lower value, the interest on that money will be returned.

Chairman PROXMIRE. Not from the date—

Mr. BOWERS. For the period of time they have had the excess amount, if it turns out that way.

Chairman PROXMIRE. The total period of time?

Admiral WOODFIN. That is from the date of the deferral agreement, Senator.

Chairman PROXMIRE. So the taxpayer would lose interest on that during part of the period?

Admiral WOODFIN. The provisional payments go back, as you know, a couple of years. To the extent that he proves his case, there would be no recovery. To the extent that he does not substantiate his case before the ASBCA, then the interest would apply from the date of the deferral agreement. So we would lose interest on the back period of, say, a year and a half or so on the difference.

Chairman PROXMIRE. A year and a half interest on \$40 million?

Admiral WOODFIN. Whatever the difference is.

PILOT PROJECT ON USING CAPITAL INVESTMENT TO DETERMINE PROFITS—  
NO VOLUNTEERS

Chairman PROXMIRE. Last year, Mr. Mendolia, former Assistant Secretary Shillito announced a new pilot project in which some consideration of capital investment would be given in the calculation of contractors' profits on defense contracts. As you know, we have been urging that profits be based on investment rather than primarily on costs, as is presently done. But I was critical of the pilot project because it was made optional for contractors to submit to this experiment. The last time my staff checked with the Pentagon, a few weeks ago, we were told that the experiment had made no progress because there were not any volunteers. Can you verify this or tell me what progress has been made?

Mr. MENDOLIA. Your information is accurate. There are no volunteers.

Chairman PROXMIRE. What kind of a pilot project is this?

Mr. MENDOLIA. The pilot project was introduced as an option. I think you could speculate that in the 10 months or so that it was in operation, that it was not attractive to those who examined the option. And, therefore, it was not selected by a prospective contractor.

Chairman PROXMIRE. So those of us who criticized it because it was optional and voluntarily were right, it has not worked on that basis?

Mr. MENDOLIA. I might put it in a little different perspective. I saw two kinds of criticism. One, I think coming out of your office, said, "Let us not have this pilot project, because it will double the profits

of the contractors, and, therefore, it is an unconscionable form of contract." My first examination of the pilot process said to me that it was not attractive to a prospective contractor. And I would be surprised if anybody would ever take it. The record shows that it is unattractive, because it does not offer increased profit opportunity. And, therefore, our job is to determine ways of making the trial work. We have encouraged the services to see if they can get contractors to pick up that option.

Chairman PROXMIRE. Is not the new experimental program biased toward increasing profits by giving contractors an option to elect to come under it? Let me read from last year's testimony:

Do you believe there will be a tendency for contractors to elect to come under it only if it is likely to increase their profits?

Mr. SHILLITO. Well, first of all, I sure am happy to hear that you now feel that we are wise to go ahead with this experimental program. And, second—

Chairman PROXMIRE. I would not say that you were wise to go ahead with a particular experimental program, but what I say is that I think you are wise in looking around for new programs and to experiment with them.

Mr. SHILLITO. Thank you.

Second, I would say that this will not, as a test, insure that the contractors will only see an increase in their profits.

The defense procurement circular gives ourselves and the contractor the option to go or no-go on this.

We hope that we are going to end up with about 200-plus contracts over the next year—

Chairman PROXMIRE. But also contractor gets the first option. He will not come in unless he is going to increase his profits.

Mr. SHILLITO. And we, of course, feel quite strongly that most of these contractors are going to want to get involved in this test just to see how it works.

By the way, it is not contractor first and defense second. It is a mutual situation. That is what this test says. It is a mutually agreed to plan to negotiate our contracts, heavily considering profit on capital, not all, but 50 percent.

Mr. Shillito was not right.

Mr. MENDOLIA. Obviously not.

#### DEFENSE DEPARTMENT DOES NOT COLLECT RETURN ON INVESTMENT PROFIT DATA

Chairman PROXMIRE. For years I have been urging the Pentagon to collect data on actual profits realized by contractors as return on capital investment. It would be a simple matter, requiring very little effort on the part of the Pentagon, to simply direct contractors to supply such information at the completion of each contract. Surely they know what their profits are. Is the Defense Department collecting this information or are you still in the position of not knowing what profits contractors are actually making on their investment?

Mr. MENDOLIA. To my knowledge, we are not collecting that particular kind of data.

Chairman PROXMIRE. Will you begin collecting this information and providing it to the subcommittee?

Mr. MENDOLIA. I do not know that we have authority to collect that kind of information.

Would you speak to that, Mr. Malloy?

Chairman PROXMIRE. Mr. Malloy.

Mr. MALLOY. Mr. Chairman, we do not, as Mr. Mendolia indicated, collect return on investment after-the-fact profit data on a contract-

by-contract basis. We have never done that. We have said, I believe, to the subcommittee and to others that if this new profit policy goes into effect, and we have the mechanics available to do this, we do intend to collect information just as we do now on a contract-by-contract basis on investment—excuse me, we collect it now on cost, and we would do it on investment.

Chairman PROXMIRE. I am astonished that you do not have authority. After all, that is the taxpayers' money. The Renegotiation Board was set up to determine whether profits have been excessive. One consideration certainly is the return on investment. It is perfectly possible for the margin on costs to be relatively modest, but to have an enormous return on investment, a factor that we ought to know about.

Mr. MALLOY. Mr. Chairman, I personally believe that there are plenty of ways that we could get this information either through a contract provision, or by collecting it the way we now collect the information on profit on costs. I do not think there is fundamentally a problem here. We have never seen any great purpose in doing it until we have a reason. This is a very large administrative undertaking.

Chairman PROXMIRE. We would like to know. I think it is very desirable, for one thing, to be fair to the contractor, and also fair to the taxpayer. After all, why should it not be a consideration that the defense contractors are making maybe 10 percent, which would not be enough on this capital, or making 50 percent, which would be too much?

Mr. MALLOY. I think two reasons. No. 1, I said it is a very large administrative undertaking. And No. 2, the collection of that information on a contract basis would be terribly misleading to people unless it fit into an overall policy or approach. You can get results that will look spectacular but are not spectacular at all, depending on the investment situation, and whether the contract work was labor-intensive or capital-intensive.

IF PROFIT DATA UNKNOWN, HOW DO DOD PEOPLE DETERMINE THAT PROFITS ARE LOW?

Chairman PROXMIRE. For years the people in industry and the people in the Defense Department and the people in the military have been saying that defense profits are too low. How can they possibly make that judgment if they do not know what the return on capital is? They ought to be in a position to evaluate this.

Mr. MALLOY. As you well know, Senator, all of the voluminous information that we have put into your record over the past several years—

Chairman PROXMIRE. We want something that is useful.

Mr. MALLOY. I believe that information is very useful that we have provided.

Chairman PROXMIRE. It is not useful if we cannot relate it on the basis to which most of us in the society would judge whether profits are adequate or not. Any kind of a regulatory body, that is the first thing they look for, and that is the principal standard that they apply, return on investment.

MR. MALLOY. I think that the question that you and I are bandying about here is merely a method of technique. We have collected very useful information through the Logistics Management Institute, and later by the General Accounting Office, on profits on investment. That information is available. It is available on a contractor's business. Even the Renegotiation Board collected it that way. There is a tremendous amount of information available. There is a question of whether you do that on a contract-by-contract basis. And we intend to do that at some point. But it is premature at this time.

Chairman PROXMIRE. What I am asking is, we want data on actual contracts, not answers to questionnaires, especially questionnaires that we have had from the logistics group. We want to know with respect to specific contracts the return on investment. And why would not it be perfectly proper and desirable for the taxpayers' representatives to know what that is?

MR. MENDOLIA. I would like to look at that.

Chairman PROXMIRE. Would you give that due consideration, and let me know whether or not you are going to do that, as soon as you can, say when you correct your remarks?

MR. MENDOLIA. I will do that.

[The following information was subsequently supplied for the record:]

The Department of Defense currently collects profit data by contract which reflect profit-on-cost rather than profit-on-capital. For each contract utilizing the new DOD Contractor Capital Employed Profit Policy we will collect profit data reflecting profit-on-capital. To initiate a data collection system which will produce return-on-capital data for all contracts would be very costly. This costliness would result from requiring the contractor to break out his investment or capital employed by contract. This task would have to be performed in accordance with very precise definitions and methodology and would involve an independent validation to assure its acceptability and thus its usefulness.

In view of the above, the Defense Department believes its present system is cost effective for the purpose served and does not intend to initiate a new profit data collection system at this time.

#### LITTON MUST REPAY NAVY FOR OVERPAYMENTS ON THE LHA CONTRACT

Chairman PROXMIRE. Now, Mr. Bowers, earlier this year the Navy determined that Litton owed the Navy \$50 million as a result of overpayments on the LHA contract. Litton obtained a restraining order from a Federal court preventing the Navy from collecting the \$50 million and requiring it to continue paying progress payments on the LHA. I understand the courts have now decided that the Navy can collect the money Litton owes it and that it does not have to make further progress payments until the amount is paid. How much does Litton owe the Navy and when will the full amount of the overpayments be collected?

MR. BOWERS. The \$50 million has been reduced to about \$30 million.

Chairman PROXMIRE. How many weeks have the progress payments been held up?

MR. BOWERS. They were held up immediately at the time that the order was received. And then at that time, in an attempt to settle the total matter before us, which was in several areas, we entered into a short intensive negotiation with Litton for a 3-week period. They are participating in this with the intent during this period to establish a cap on all of their LHA claims, to effect a settlement of the issues and

withdrawal, with prejudice, of the appeal pending before the ASBCA; to effect a withdrawal, with prejudice, of the action now pending in the Mississippi District Court; and to obtain, from Litton, a complete release of any and all claims other than those set forth above.

Chairman PROXMIRE. I get the feeling, Mr. Bowers, that you are kind of horse trading on these things. Do you not determine, on the basis of the merits what is ongoing, and then insist on being paid that?

Mr. BOWERS. I am stating the basis on which we have entered into this negotiation. I have told you the areas that are the goals of a 3-week negotiating period. During that period, and for that period only, we have agreed to reinstitute the payments. That period is substantially complete now. Following that, and depending upon the success of the negotiation we may be able to enter into final negotiation to solve the complete matter.

Chairman PROXMIRE. Are you negotiating in this sense—maybe I should not call it horse trading—are you negotiating on the fraud claim too?

Mr. BOWERS. That is not the issue under consideration. We are discussing specifically the LHA issue.

Chairman PROXMIRE. I understand that in the past week or so there was an attempt within the Navy to resume the progress payments on the LHA even though Litton still has not reimbursed the Navy for the overpayments, and that the Navy's legal counsel together with the Justice Department, put a stop to this attempt. Can you verify this?

NAVY RESUMES PROGRESS PAYMENTS TO LITTON, ALTHOUGH LITTON  
STILL OWES NAVY MILLIONS

Mr. BOWERS. No. As I just stated—for the specific 3-week period we have resumed the payments—but they will be stopped at the conclusion of this time, depending upon the results.

Chairman PROXMIRE. Why did you resume them, then? They still owed you the money.

Mr. BOWERS. Specifically for the consideration of entering into these negotiations and the agreements which we expect to obtain.

Chairman PROXMIRE. Then you lose your bargaining position when you start repaying them, do you not?

Mr. BOWERS. No. This was a very limited period of negotiation, and the threat of not being able to resolve the matters at issue by the end of that period is a very real threat.

Chairman PROXMIRE. Did Litton make a plea that they would get into a financially desperate plight, that they would not be able to continue building until you continued some progress payments during this 3-week period?

Mr. BOWERS. Their ability and desire to perform was evident. Their need to have the money during that period was not a stated issue at this particular juncture.

Chairman PROXMIRE. Did they suggest they might stop construction if they did not get it?

Mr. BOWERS. No; they did not.

Chairman PROXMIRE. I cannot understand why you agreed to it under this circumstance when they owed you the money. I cannot imagine two private corporations operating on this basis.

Mr. BOWERS. They have two claims and other matters in the courts against us at this time, and this was an attempt to try to resolve the total differences between us.

Chairman PROXMIRE. For the record, can you tell us, not now, but for the record, will you indicate what they had in court against the Navy that would warrant this kind of consideration?

Mr. BOWERS. Yes.

[The following information was subsequently supplied for the record:]

A major element in our negotiations with Litton is to obtain an agreement limiting the size of the LHA claim. If this limitation is not achieved, the Navy will be forced to continue its litigation before the Armed Services Board of Contract Appeals and before the Court of Claims for an indefinite period with adverse effects on the Navy's continuing relations with Litton and Litton's overall performance.

LHA TARGET TOTAL COST—\$795.265 MILLION

Chairman PROXMIRE. Can you tell us what the most recent estimate of the cost of the LHA is, whether there have been any cost increases in the past year and whether any further increase or schedule delays are expected?

Mr. BOWERS. First of all, we are operating under a contracting officer's decision which puts a firm ceiling on the costs which we can anticipate paying for the ships. We have paid as of November 15, \$546 million. The lead ship is about 59 percent complete, with the other ships at lower stages of completion. Now, the contracting officer—

Chairman PROXMIRE. And that relates to that \$549 million, that payment of \$549 million relates to the completion of 59 percent.

Mr. BOWERS. Yes, sir, on the lead ship.

Chairman PROXMIRE. Go ahead.

Mr. BOWERS. Now, the contracting officer's decision, which is active at this point, sets the firm target cost at \$763.9 million, profit at \$31.365 million, or a total price of \$795.265 million. Included in that are changes of \$19.315 million.

Chairman PROXMIRE. In the course of your statement you say, Mr. Bowers: "I think we should be placing more emphasis on a prospective contractor's record as a manager. I do not think we are placing enough emphasis on his past performance in terms of ability to control costs, to deliver on time, and deliver equipment which conforms to the contract specifications." Those are nice sentiments. I agree with them wholeheartedly, and I congratulate you on them. And now let us apply them to Litton.

APPLY PAST PERFORMANCE RECORD TO FUTURE PROCUREMENT DECISIONS

Mr. BOWERS. In a current negotiation and/or competition, I think there would be a significant judgment of this type placed on anything that they turned in. I completely agree.

Chairman PROXMIRE. So you make this a serious element in future procurement?

Mr. BOWERS. Yes, sir.

Chairman PROXMIRE. The pure performance.

I am going to have to leave to vote. I will be back in 6 or 7 minutes. The subcommittee will stand in recess.

[A short recess was taken.]

SHOULD-COST STUDY OF GRUMMAN OPERATIONS BECAUSE OF RISING COST  
OF THE F-14

Chairman PROXMIRE. The subcommittee will come to order.

Mr. Bowers, respecting Grumman, some time ago the Navy ordered what would have been then described as a should-cost study of the operations of the Grumman Corp. This study came on the heels of disclosures of cost overruns on the F-14 aircraft program. The study was completed more than 2 years ago, but its findings have never been made public. Now, how many persons were in the study team, and how long did they spend on the study, and how much did it cost?

Mr. BOWERS. May I talk in general and get that in the midst of the discussion?

Chairman PROXMIRE. All right, sir.

Mr. BOWERS. The study was, as you know, started in July of 1971. Initially the term "should cost" was used, although the work performed was essentially quite different from classical should-cost studies. The study was initiated when the Navy learned of the very significant cost growth potential in the F-14 program. To fully understand the problem, and to assure that everything was being done to understand the cost problem, and achieve maximum efficiency in production, a Navy team was established, with Grumman's consent to work at the Grumman plant investigating every aspect of improvement on all of their programs. The work encompassed management structure, accounting methods, major tool utilization, and efficient use of plant space and facilities, and in short, everything that contributes to management of aerospace programs. An excellent working relationship was established by the Navy and the company, and complete cooperation between the two was achieved, including freedom of access to activities and figures that are not normally appropriate for the customer-contractor relationship. The investigation covered every aspect of the operation where improved efficiency and reduced cost might be attained. The activity was completed with a significantly improved understanding and relationship between Grumman and the Navy. This assisted greatly in many difficult negotiations which you know followed from that date.

Grumman carefully evaluated the concepts that were investigated, and they adopted those which showed promise of greatest benefits.

In addition, they continued efforts to maintain efficiency in the face of a decreasing business base which had contributed to the cost problems.

Grumman's performance in the area of company overhead has improved in the period since the study. The Navy considers that the total cost per man-hour available that they have is competitive to other industry figures. The actions taken resulted from items covered in this effort, and we are sure they contributed; but they were not necessarily solely responsible for this improved performance.

## GRUMMAN SHOULD-COST STUDY COSTS NAVY ABOUT \$400,000

Now, to get to your question, the cost to the Navy for this work is equivalent to the salaries of approximately 50 men over a 4-month period.

Chairman PROXMIRE. Were there 50 people involved?

Mr. BOWERS. About.

Chairman PROXMIRE. And they spent about 4 months on it?

Mr. BOWERS. Yes, that is about right.

Chairman PROXMIRE. And it costs them how much?

Mr. BOWERS. I really have not estimated what the salaries were. I suppose they were in the between \$10,000 and \$20,000 area. So you can figure one-third of a year—I have a calculation of about \$400,000. The efficiencies which we feel may have been available from this can be calculated at whatever percentage one might be able to estimate over the approximately \$1 billion cost of sales at Grumman over the last few years. But I think that really you have to look at it in the context, when we had the massive problem at that time. The Navy could do nothing else other than get into Grumman and thoroughly understand the problem.

Chairman PROXMIRE. As you know, I have been trying to learn the findings of this study for some time. I have written the Secretary of the Navy. And my staff has been trying to get up to your office, as you know. Can you tell us anything more about the findings and recommendations other than the general statement that this has allegedly improved the performance of Grumman?

## NO FINAL REPORT ON A \$400,000 STUDY

Mr. BOWERS. Well, first of all, there really was no final report prepared. Of the various ideas and specific things that were investigated, we never made an item-by-item evaluation of their degree of improvement. Rather, we evaluated their total performance and it looks very good.

Chairman PROXMIRE. You know, \$400,000, it would seem to me, would merit a final report.

Is it correct that the study was presented to Admiral Zumwalt in a briefing and that he was so surprised and shocked by the finding that he clamped a lid on the report and ordered that it not be disclosed to the public or to the Congress?

Mr. BOWERS. I have no information to that effect. I believe that from the very beginning the reason it was held confidential was that we were exchanging items of a proprietary nature to Grumman.

Chairman PROXMIRE. Does anybody else accompanying you have any knowledge of whether Admiral Zumwalt made this decision?

Admiral EVANS. To my knowledge, he did not. I know of nothing that would verify that statement.

Chairman PROXMIRE. You do not know directly?

Admiral EVANS. I do not know directly. I know nothing that contributes to that statement.

Chairman PROXMIRE. So you do not know that he said it should not be disclosed?

Admiral EVANS. No, I do not.

Chairman PROXMIRE. I still do not understand why an expensive nonclassified report such as this should be kept hidden from the public in a drawer in the Pentagon. It seems to me that you can excise the proprietary information which you say is the reason why it has not been made public.

Mr. BOWERS. Well, no specific report has ever been made. Therefore, it has not been hidden. Of course, there was a large amount of working papers.

Chairman PROXMIRE. How about the findings and documentations?

Mr. BOWERS. There were statements made in a stand-up presentation of the captain of the team.

Chairman PROXMIRE. Is it too hot to write a report on?

Mr. BOWERS. No, sir.

Chairman PROXMIRE. Is not this extraordinary, really? It would seem to me it is far more orderly and efficient and reliable to have something in writing so that you can look back on it and determine who is responsible for it, and what precisely was said, rather than simply an oral report that was made without any basis—unless it was taped, and then we could not be sure of the tapes.

Mr. BOWERS. I really believe that the spirit of the study was one to aggressively and cooperatively look at every area where we might effect improvement. It was not on a report card basis for future analysis that we went into it. We went in to help. We did, and both Grumman and we feel that a great deal was achieved by it.

Chairman PROXMIRE. Is it not true that the study found a high level of inefficiency in the Grumman operation operation?

Mr. BOWERS. I have no reason to believe that in particular. I have examined the overhead rate structures—

Chairman PROXMIRE. It seems to me, from what you have told us, the conclusion is that there must have been, because you say there were improvements, and I take it there were improvements in efficiency—

Mr. BOWERS. I have examined the history of—

Chairman PROXMIRE [continuing]. Amounting to a billion dollars.

Mr. BOWERS. The overall rate structure held firm over the past several years, when the business base was decreasing. I have been rather amazed at their ability to bring those variable costs down at a more rapid rate than the business base decreased. And their numbers both at that time and during the period of decrease have stayed very competitive. Of all the areas where we might be critical of their performance, I certainly could not level any real serious criticism at Grumman in that area.

Chairman PROXMIRE. Did the recommendations include sizable reductions in the work force?

Mr. BOWERS. I have not seen, myself, any of the specific activities from the report other than general summaries.

Chairman PROXMIRE. Does anybody else know about that who is with you today?

Will you allow the staff of this subcommittee to review the findings?

Mr. BOWERS. Well, as I said, there is a matter of confidentiality between ourselves and Grumman. Any discussion or release of that data would involve Grumman also.

Chairman PROXMIRE. Would you attempt to secure their agreement to such a review by the staff of the subcommittee?

Mr. BOWERS. I will so attempt.  
[The following information was subsequently supplied for the record:]

DEPARTMENT OF THE NAVY,  
OFFICE OF THE SECRETARY,  
Washington, D.C., January 10, 1974.

HON. WILLIAM PROXMIRE,  
*Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee, U.S. Senate, Washington, D.C.*

DEAR SENATOR PROXMIRE: Secretary Warner has asked me to respond to your letter of 8 November 1973 requesting information regarding the study accomplished by a Navy team at Grumman during the period 25 July-30 November 1971.

During my appearance before the Subcommittee on Priorities and Economy in Government on 16 November 1973, you reiterated your request for data from the Navy Cost Review Study, and further requested that, although the data was considered proprietary, we seek agreement with Grumman Aerospace Corporation to release additional detail.

This matter has been discussed with officials of the Grumman Aerospace Corporation. Enclosure (1), coordinated with GAC, represents the results of such discussions, providing an overall summary of the study's recommendations and statements of related cost reduction actions taken by GAC. GAC has advised that any expansion beyond that offered by enclosure (1) at this time is considered proprietary.

Regarding costs of the study effort, the Review Team was made up of 53 Navy and Department of Defense personnel of varying expertise working full or part time on the study during an approximate four month period. Costs for the study team effort have been calculated to be \$242,000.

I hope you will find the information provided herein useful to your needs. Your interest in this matter is appreciated.

Sincerely,

JACK L. BOWERS,  
*Assistant Secretary of the Navy.*

Enclosure.

#### NONPROPRIETARY SUMMARY OF THE NAVY COST REVIEW STUDY

##### STUDY OF GRUMMAN AEROSPACE CORPORATION (GAC)

The study recommendations can be summarized as follows:

- (a) Complete the implementation of improved Grumman systems and procedures for managing resources and product accomplishment, on an accelerated basis.
- (b) Expand existing Grumman labor controls to improve identification of skills and tasks and increasing the use of engineered labor standards.
- (c) Refine and expand existing Grumman methods and procedures for controlling purchased material costs.
- (d) Establish better Grumman budget goals for overhead costs and improving management control.
- (e) Complete the corporate-wide comprehensive inventory and analysis of functions, organization, and staffing and effecting indicated further consolidation, streamlining and pruning.
- (f) Centralize and consolidate Grumman manufacturing efforts where analysis showed that increased plant and equipment utilization should reduce total cost.
- (g) Dispose of excess equipment.
- (h) Phase in all economically feasible manufacturing at Grumman in lieu of subcontracting.

##### SUMMARY OF GRUMMAN/USN COST REVIEW ACTIONS

During the period 25 July through 30 November 1971 an in-depth study was performed by a combined team of Grumman and U.S. Navy personnel to ascertain what economies might be effected in Grumman's internal operations. Although this study was initiated by the Navy, concurrence was granted by Grumman within the framework of the Memo of Understanding dated August 13, 1971 and signed by both parties. Under the terms of this agreement Grumman

granted access to the Government to data normally considered highly proprietary. This was done with the specific understanding that revelation to a third party in or out of the Government would not be made due to the sensitive nature of the information.

At the time of the review Grumman had already undertaken many actions which lead to cost reductions and more streamlining of its operations in the face of spiraling inflation and a declining business base. Since many recommendations of the Navy Review Team paralleled or supplemented Grumman's actions as well as integrated new ideas for efficiencies it is difficult to differentiate as to where the credit should go other than to the combined team.

Below are examples of actions taken between May 1969 and December 1973:  
Personnel reductions:

	June 1970	June 1971	November 1973
Direct .....	19, 652	16, 542	16, 283
Indirect .....	8, 668	7, 466	6, 363
Total .....	28, 320	24, 008	22, 646

Reduction in corporate fleet aircraft.

Reduction of over 1.3 million square feet of floor space.

Reduction in summer hires program.

Reduction in industry memberships and associated dues.

Reduction in travel expenses.

Increased in-house manufacture of formerly subcontracted assemblies.

Reduced plant equipment and rolling stock.

Consolidation of Estimating and Pricing.

Implementation of Standards Development/Performance Measurement Program.

Implementation of the "Excel" program on a plant-wide basis.

In addition to the efforts listed above, GAC instituted a further cost reduction goal of \$25M in CY 1973. As the year closes, we see a realization of between \$22 and \$23M.

Chairman PROXMIRE. Mr. Mendolia, as you know, the subcommittee has been collecting data from every Government agency on the way contractors' retirement costs are reimbursed. You have been extremely helpful and cooperative with us in the collection of the facts and we are most appreciative. I should add that the Navy has also been most cooperative and responsive to the requests for information that we have made and I hope we can continue working together on this basis.

**DOD CONTRACTORS HOLD BACK RETIREMENT FUND PAYMENTS—DOD ALLOWS THIS FOR UP TO 4 MONTHS**

Now, Mr. Mendolia, the facts show that a number of contractors have been requesting and receiving reimbursement from DOD for the costs of contributions into their workers' retirement funds and have been holding onto that money totaling tens of millions of dollars annually—they have been holding on to that money instead of paying into the retirement funds for as long as 1½ years. During this time the contractors have been using this money for their own private purposes. The firms holding onto this money the longest include some of the largest contractors—Boeing, General Dynamics, General Electric, Fairchild, Lockheed, LTV, ITT, United Aircraft, Rockwell International, and several others. We will issue a study of this and related matters in the near future and I do not want to go into all the details now.

I realize you have changed your policy recently and contractors are now allowed to withhold the funds for only 4 months. But are you aware that the AEC rules permit no delays in turning this money over for their contractors and that all but one of AEC's contractors comply with this policy? Why does your agency permit even a 4-month delay? Why not require that the money be paid into the retirement funds as soon as it is received?

Mr. MENDOLIA. I cannot speak to that directly. Having reviewed the record, though, I think it was the considered judgment of the Department of Defense that 120 days represented a reasonable length of time after having reviewed practices.

Mr. Malloy, do you have anything further to add?

Mr. MALLOY. Yes. I am not familiar with the AEC rule, and I would have to look at it. But roughly 80 percent of the AEC work is placed with what we call large Government-owned contractor-operated plants. It is a different environment completely than the general industrial environment. When we selected—

Chairman PROXMIRE. Not completely. They would have substantial—although you are right, the overwhelming amount is in Government plants, but a great deal not, and they do not make provisions for those that are not.

Mr. MALLOY. As I say, I am not familiar with their rules. But as we looked at the matter of the delay of putting money into the pension fund, we felt it was too long. The question then became, where is the right number? Now, in correspondence with us you suggested 6 days, which we did not think was practical. In our survey of contractors we found that with most of them the standard practice, one might say, was to pay in in up to 120 days. So that coincides with the way contractors' books are kept on a quarterly basis. And we thought that 30 days after the end of the quarter would be a reasonable way to proceed, at least initially.

Chairman PROXMIRE. But you are aware that many of your own contractors, pay this—turn in the retirement and reimbursement money over the retired funds without any delay?

Mr. MALLOY. They do it within the first month. It varies all over the lot, both in industry generally and with respect to defense contractors.

PROMPT RETIREMENT FUND PAYMENT IS THE RIGHT THING TO DO,  
REGARDLESS OF GOVERNMENT REQUIREMENTS

Chairman PROXMIRE. Let me indicate some of the ones that have no delay: Philco-Ford, CRA, Remington, Shell Oil, LTV, Uniroyal, Western Electric, Aerospace Corp., Avco, Bell Telephone, Chrysler, Eastman Kodak, Federal Cartridge Corp. If they can do it, why can this not be a policy for all the rest of them? It is obviously advantageous. If I were a corporate treasurer, I would say, as long as they let us get away with it, why not hold out? After all, we can use the money. When you have millions of dollars involved, the interest mounts up. And that is what corporate treasurers are paid to do. So unless you have a rule which requires them to make a payment to the retirement fund directly, there is going to be an increasing tendency not to do it. I think these firms that do it should be commended and they deserve

great credit, because they are depriving themselves deliberately of a profit.

Mr. MALLOY. Of course, it is difficult to generalize. It may well be that the covenants governing the pension fund for those contractors require that. And these covenants vary from fund to fund.

Chairman PROXMIRE. Whether Governments require prompt payment or not, it seems to me it is the right thing to do. And that is what the money is being paid for. It is not being paid to give an extra added advantage to the corporation that is dilatory.

Mr. MENDOLIA. We would be glad to reexamine that.

Chairman PROXMIRE. Will you do that? I would appreciate it.

Mr. MENDOLIA. Sure.

Chairman PROXMIRE. Now, in your statement you refer to predetermined cost ceilings for weapons systems. Will this apply to the D-1 program and if so, what is the cost ceiling for it?

Mr. BOWERS. On which? B-1 is an Air Force program.

Chairman PROXMIRE. Yes, I know it is.

Mr. BOWERS. What was your question?

Chairman PROXMIRE. Let me ask Mr. Mendolia about this. In Mr. Bowers' statement he refers to a predetermined cost ceiling for weapon systems. I wonder if that would apply to the B-1 program, and what is the cost ceiling for?

Mr. BOWERS. To the best of my knowledge, I do not have anything like that in my statement, sir.

Mr. MALLOY. That is not in his statement.

Mr. BOWERS. In what section here?

Chairman PROXMIRE. I beg your pardon, I have the wrong statement. I meant to direct it to Mr. Mendolia's statement.

#### NO COST CEILING YET FOR THE B-1 BOMBER

The third sentence in the paragraph under the heading "Cost Control" reads:

The establishment of predetermined cost ceilings is intended to filter down to subsystem and component level and to trigger redesign, where necessary, to meet these goals.

My question is, will this apply to the B-1 program, and if so, what is the cost ceiling for?

Mr. MENDOLIA. My view of the B-1 program, and my knowledge of it to date, says that it is premature to apply that principle. In other words, we are in the development stage building a prototype. And I would like to state at that point that I think, as I alluded to in my statement, I think concepts unwisely used do not get the results. In my view, the B-1 is in the R. & D. stage, and there is no basis for setting a price ceiling until we have more knowledge.

Chairman PROXMIRE. At what stage do you apply the concept?

Mr. MENDOLIA. When we have determined that the scope of work is sufficiently defined that one is enabled to make a cost estimate either by a parameteric cost basis or by a detailed engineering estimate. The B-1 bomber, in my estimation, is quite a ways from that stage.

Chairman PROXMIRE. Is it possible, in your opinion, that the total program unit costs for the B-1 bomber, including all armament, bombs,

nuclear warheads, missiles, spares and other costs included in the total, can reach \$100 million per copy?

Mr. MENDOLIA. As I recall, that is your number.

Chairman PROXMIRE. That is my number. And I ask you if you think it is possible.

Mr. MENDOLIA. I have no basis, and I would be loath to make an estimate on the basis of the knowledge I have, which is in a very evolutionary stage. And I think that is true of everybody that is associated with the B-1 bomber. It is in a very evolutionary stage of development.

Chairman PROXMIRE. Evolutionary in the sense that it is still rising?

Mr. MENDOLIA. That is your statement, sir. It may. But it is R. & D. And in the nature of R. & D. work there are a lot of unknowns.

Chairman PROXMIRE. You do not think it is out of the realm of possibility that you go to a \$100 million?

Mr. MENDOLIA. I would not confirm that, because I have no basis for it. I have no knowledge on which to base such an extrapolation.

Chairman PROXMIRE. Can you tell us the names of the programs to which predetermined cost ceilings have been established and give us the amounts of those ceilings?

Mr. MENDOLIA. I would like to do that for the record. I would say there are some successful programs. I do not have that.

[The following information was subsequently supplied for the record:]

Design-to-a-Cost objectives (or targets) have been incorporated in the following development contracts. These design-to-cost objectives are synonymous with the meaning of the phrase "predetermined cost ceiling."

A-10 Airframe—\$1.5 million cumulative average unit production cost for a total of 600 aircraft.

A-10 Engine—\$215,000 unit fly away production cost of 1500 engines.

A-10 Gun—\$85,000 cumulative average unit production cost of 600 gun systems.

AMST—\$5 million flyaway design goal for the 300th production unit. (No planned production.)

B-1 ECM—\$1.4 million unit production cost for a quantity of 241 units.

EF-111A—\$5.4 million cumulative average unit production cost.

TACAN—\$10,000 unit production cost goal for lots of 500 units.

ELMS—\$14 million Design-to-cost-objective.

MICV—\$122,937 unit production cost for a quantity of 1000 vehicles.

HLH Engine—\$208,000 average production cost for 1,125 units.

UTPAS—\$600,000 average unit production cost.

SAM-D—Cost targets vary with quantity and sub-system.

MIRID—\$248.55 average unit production cost for a quantity of 10,000 units.

CH-53E—\$3.18 million average unit production cost at the 70th aircraft.

The production cost objective in each case is a predetermined cost ceiling for production quantities which the development contractor must plan for and design toward in the development stage. It is a parameter of the development contract, just as are the performance requirements of the hardware being developed. The development contracts themselves are in almost all cases cost-type contracts. The cost objective is a fixed price unit cost which will apply to production quantities. Forcing the contractor to design to this cost provides a necessary discipline to prevent runaway production costs. It also allows for more flexibility in making performance and quality trade-offs during the development phase.

#### GAO REPORT ON KICKBACKS AT INGALLS SHIPBUILDING—NAVY RESPONDS

Chairman PROXMIRE. Mr. Bowers, as you know, we gave you an advance copy of the GAO report into alleged improprieties and kickbacks in subcontracts awarded by the Ingalls Shipbuilding Division of

Litton. Can you give us your reaction to the report and tell us what action the Navy plans to take with regard to any of the prime contracts or subcontracts involved?

Mr. BOWERS. The list goes back to actions in 1970, 1971, and a few recent as 1973. We knew about an additional one that is not in the GAO report that was, I believe, at an earlier time, which was handled promptly by Litton. The sum total of it is that, obviously, I share with you a very serious concern. I want to make sure that we understand that no illegal things have been proven, but we would agree that they appear irregular. We definitely will include this particular feature in our investigation at one of our regular procurements reviews of Litton's procurement system. This is scheduled for December of this year. We will see to it that this particular feature is very carefully covered. I certainly, at the very least, will want Litton to assure us that these problems have not only been corrected, but also to give us assurances that they cannot recur.

Chairman PROXMIRE. I realize that you are relatively new in your position. But can you tell us why—certainly, there is nothing personal in this question—can you tell us why the Navy did not learn of the improprieties and possible criminal violations by itself?

Mr. BOWERS. Well, if the information that was provided to GAO had been provided to us, we would have been in a position to disclose it and take action on it. Our people there at the plant acted in accordance with the data provided them on each particular subcontract action that they were supposed to be working on. Incidentally, a couple of these subcontracts were for capital facilities, and things that Litton would not normally require Navy consent for. In looking at all the data that was submitted, there was no reason to understand that these irregularities existed.

#### NAVY SHOULD HAVE BEEN AWARE OF IRREGULARITIES AT INGALLS

Chairman PROXMIRE. Let me ask Admiral Woodfin about this.

It seems to me, admiral, that if our staff could find out about it, I do not know why the Navy could not. It seems to me you are in a far better position, with far more people, you are directly involved with this, you are observing it daily. There are people right in the plant.

Admiral WOODFIN. Mr. Chairman, I think that a local surveillance group there—and that is what they are there for, to surveil the contractor—should be aware of what is going on, and if there are any irregularities, they should have known of them. I do not think there is any question about that. They are involved in the consent action.

Chairman PROXMIRE. The Secretary says nothing has been proven—he is right—but they are irregularities at best.

Admiral WOODFIN. Yes, sir. Right now the staff we have at Ingalls in this area, is relatively small, a handful of people, four or five, involved in looking at their procurement actions which they review and consent to. The big actions come in for approval. The small actions cannot be reviewed individually so we concentrate on the overall procurement system and its adequacy. I think where we should be concerned in these matters is with the matter of internal controls or what I would call internal audit type things that they should be worried about. We also use our audit service to look at these areas. I just do

not think we did a good enough job in these matters. I think we can do better, and as the Secretary says, we plan to get into this a lot more thoroughly in this next procurement review at Litton.

Chairman PROXMIRE. Is it possible that this kind of situation exists in other plants?

Admiral WOODFIN. I would say possible, but not probable. I think most of our companies, the major ones, have fairly adequate internal control systems. And I think we have a pretty good feel for their type of purchasing systems which are a lot like ours, that is in miniature, and they have the same kind of review processes that we go through in terms of the proper number of bidders and that sort of thing. But it can happen that there can be a breakdown in internal control.

Chairman PROXMIRE. Could you give us your reaction to the report and tell us whether DOD plans to maintain and continue its policy of washing its hands of subcontracts, as the Comptroller General put it?

#### SUBCONTRACTING PROCEDURES REVIEWED BY THE DEFENSE DEPARTMENT

Mr. MENDOLIA. That is not our position. As a matter of fact, we are enhancing our review of subcontracts. That statement has been made.

Chairman PROXMIRE. What are you doing?

Mr. MENDOLIA. We have a process that is ongoing for reviewing the subcontracting procedure.

Chairman PROXMIRE. When you say ongoing, what are you doing to step up your policy? You say you have an ongoing policy.

Mr. MENDOLIA. That is right.

Chairman PROXMIRE. What have you done to make it more intensive and effective?

Mr. MENDOLIA. We have urged that the appropriate group—as I recall, that is the Defense Contract Administrative Offices—increase their surveillance to be sure that we are taking appropriate action through an organization that deals with the contractors.

Chairman PROXMIRE. Will you give us a copy of that? Was that a formal directive or instruction?

Mr. MENDOLIA. No, it was not.

Chairman PROXMIRE. Was it put in writing at all?

Mr. MENDOLIA. No, it was not clear to me what you were speaking of. I have been reviewing that, obviously, after looking at some of the Litton problems.

Chairman PROXMIRE. Are you considering any major improvements?

Mr. MENDOLIA. We are going to look at that and take whatever action we consider appropriate.

Chairman PROXMIRE. Will you let us know for the hearing record what action that will be?

Mr. MENDOLIA. I will be glad to do that.

[The following information was subsequently supplied for the record:]

#### SUBCONTRACTING

As indicated in the statement of the Assistant Secretary of Defense (Installations & Logistics) before the Committee, the DOD uses several techniques to monitor prime contractors' subcontract programs. These techniques include review and approval of contractors' purchasing systems, the review and consent

to individual subcontracts above certain dollar amounts, the evaluation and agreement on contractors' proposed make-or-buy programs and the use of "flow-down" clauses in subcontracts to incorporate certain contract clauses of the Armed Services Procurement Regulation (ASPR).

Recent changes to DOD guidance concerning control of subcontracting includes the issuance in January 1973 of a manual to prescribe additional detailed procedures for making purchasing system reviews and preparing the evaluation report. In April 1973, the ASPR was revised to broaden the scope of types of contracts which would be used to determine whether or not a contractor should be included in the purchasing system review program.

The ASPR Committee is currently reviewing the matter of subcontract management to determine what further changes and improvements to this process may be appropriate. Areas under consideration include:

Whether the Government should be further involved in determining the responsibility of prospective subcontractors.

Whether the Government should undertake more in-depth analysis of subcontract engineering, technical and other risk factors.

Whether the use of the make-or-buy clause should be increased.

Whether there should be increased subcontract administration by the Government.

Adoption of any such changes would, of course, require an assessment of available personnel and other resources, as well as whether additional control by the Government over subcontract matters might tend to disrupt the contractual privity between the prime contractor and the subcontractor and thereby nullify the ability of the prime contractor to legally enforce the provisions of his subcontract. At the same time, greater assumption by the Government of responsibility for subcontract decisions might tend to relieve the prime contractor wholly or partially of his responsibility for total prime contract performance.

Chairman PROXMIRE. Mr. Mendolia, I want to come to something that bothers me. Both of you gentlemen, I believe—perhaps it was Mr. Bowers, but I thought it was both—addressed yourselves to competitive contracts.

Was that your statement, Mr. Mendolia?

Mr. MENDOLIA. Yes.

#### DOD REACTS TO THE SUBCOMMITTEE STUDY ON COMPETITIVE PROCUREMENT

Chairman PROXMIRE. Yesterday we had a presentation by a very able young man who has made a study at the request of the subcommittee. And we have a chart here that is based on that study. And you see the price reductions from competition. We gave you an advance copy of that study, showing dramatic reductions on complex, advanced technology weapons systems when competitive purchases replaced sole-source procurement. You might take a look at that chart, illustrating some of the reductions. Why does not the Pentagon do much more of this?

And by the way, the 20 cases in the study were culled from thousands of contracts, we could only locate that many. The conclusion of Mr. Yuspeh, who conducted the study, was that there were very, very few—and also that the procurement officials were surprised themselves when they went back to their record to cull these competitive examples, and they had great difficulty finding any, they were shocked themselves when they saw how few they were.

Mr. MENDOLIA. That does not jibe with my intelligence on the situation. My understanding is that Mr. Yuspeh was an employee of the Institute for Defense Analysis, a summer employee. My further understanding is that he culled out selected procurements, of which there were many. He did not select what even any elementary statistical expert would consider significant samples. He covered a period from

1958 to 1973, in which the 20 cases amounted to \$1.26 billion. In that same period we procured \$528 billion. And so the 20 cases constituted about a quarter of 1 percent.

Chairman PROXMIRE. Let me just interrupt to say, the problem here is that Mr. Yuspeh did this at our request after he left IDA.

Mr. MENDOLIA. The data, though, came right out of the IDA.

Chairman PROXMIRE. He had been with IDA, but he was not with them when he made the study.

Mr. MENDOLIA. Where did he get the data?

Chairman PROXMIRE. Our staff gave him a lot of it.

Mr. MENDOLIA. Then, I guess we have a difference of intelligence.

Chairman PROXMIRE. What you tell us, the facts are the same, but you are putting an entirely different interpretation on them. What will clear this up is if you can give us more examples of this kind of a situation.

Mr. MENDOLIA. We would be delighted to do that.

Let me make one final comment, which goes something like this, which is an overall appraisal of the study. Mr. Yuspeh dug through many, many cases, and he brought out what I would call the astounding conclusion that competition reduces prices. That is not an astounding conclusion. I made that in my opening statement. And I would say that we in Defense recognize that. And we apply it wherever it is appropriate.

Chairman PROXMIRE. Of course, the astounding fact is that it works with complex projects of this kind that are this technically complicated. And as I understand it, and even the Navy got from your presentation this morning, this is an area where the competition is not appropriate.

Mr. MENDOLIA. No one has ever made that statement, I certainly have not, nor do I know of any other responsible person that has.

Chairman PROXMIRE. Let us take a look at the standard missile that is reflected on the chart. How do you explain a case where the same contractor was able to cut his own price in such a short time such a large percentage? The original price was too fat to begin with, is that not the case?

Mr. BOWERS. Mr. Chairman, I have studied the report and I would like to make a couple of comments and get to one of the just as striking comparisons. Since I was with General Dynamics I would prefer to disqualify myself from talking about the standard missile. But I looked at the Talos results. The 1965 procurement, at a unit price of 159,000 was made on a sole-source contract for a 1-year buy for a quantity of 94 missiles. The subsequent \$92,000 unit price was obtained on a 3-year multiyear buy for around 500 missiles. The problem with the study that you have is that it starts with the concept that competition is good, which we will stipulate and which we believe. But the numbers, believe me, are all wrong because they represent a collection of a variety of different pieces of things which have contributed to the lowered price, so they confuse the issue. Your percentages are misleading.

Another example that was listed was the Bullpup missile. The suggestion was made that since the most—

Chairman PROXMIRE. Are you saying that in all these cases that the competitive buys involved greater numbers?

Mr. BOWERS. No, sir. I am saying that there are various kinds of things that are wrong with the report. Now, I will give you another

example. In the Bullpup missiles it was stated that in sole source the price was \$3,800, and when competitive, it went down to \$2,000. That sounds good. But what was not taken into account was that the first production sole-source price was in the above \$6,000 category, and the next sole-source price was \$4,900, and the next was \$3,800, and then when you went competitive, it went to \$2,800. There was a distinct continued reduction downward with each successive procurement.

Chairman PROXMIRE. The other chart is here too. That is \$4,900. He gave us that, he put that in his chart. And then it went down to \$3,700, and then it went down to \$1,474. That was a sharp—

Mr. BOWERS. If you will put the other chart up there, the price was something over \$6,000 on the first buy. And there was a steady reduction, whether sole source or competitive.

Chairman PROXMIRE. You have been very gracious and understandably disqualified yourself because you are an immediate former official of General Dynamics. Why do you not give us an explanation there? You know a great deal about this, because it was your firm. Here we have with a standard missile a dramatic reduction, \$149,000 to \$68,000 when they went to competition.

Mr. BOWERS. About the same things apply. The competitive part was a 5-year competitive buy as opposed to a smaller number of missiles in the first time procurement. The sole-source procurement was the first time that the missile had been produced, and it was still in an early debugging stage of the production process. Now, you have brought out a more dramatic case here, a more complex system. Most of the report dealt with small \$2,000 and \$3,000 items which are hardware type items which we just completely agree should be completed early in the process. We also completely agree that competition helps. But my only point here is that the percentages of savings that you have announced are grossly misleading.

#### DOD SHOULD MOVE TO GREATER USE OF COMPETITION

Chairman PROXMIRE. We all agree on the principle that we should move to competition. I am sure that is the sentiment of the Congress and the sentiment of the administration, too.

Mr. BOWERS. Absolutely.

Chairman PROXMIRE. But we somehow cannot seem to do it rapidly enough. There are so many forces that work the other way to counteract competition. Competition is always a cruel, painful discipline. And it is the discipline that enables our private system to work so well. And it is the lack of that which is one of the principal factors that is the reason why our public activities are so relatively costly. So we would like to just press it as hard as we can. I do not see any evidence, even on the basis of Mr. Mendolia's presentation on competition, that we have nearly enough of our procurement in competition. We have people like Admiral Rickover, whom all of you admire, who tell us over and over again that we should procure far more of our systems on a competitive basis. He says his experience is that competition consistently reduces cost between 30 and 40 percent, is what he told me.

Now, I see you are smiling Mr. Mendolia. Would you like to reply to that?

## COMPETITION BRINGS HIGH PRICE REDUCTIONS BY REDUCING OVERHEAD

Mr. MENDOLIA. Well, I keep hearing numbers like that, and I hear it in the Pentagon, that competition reduces costs by 30 or 40 percent. And my view is, where are these companies that make 30- or 40-percent profit margin? In other words, to me there are two factors—

Chairman PROXMIRE. That is a very good point. I raised that point yesterday. I said, after all, if you do have a situation where there is a 30- or 40-percent amount here, why is it not reflected in profits?

Mr. MENDOLIA. That is right.

Chairman PROXMIRE. The answer to that that was given yesterday was reasonable. They said, it is eaten up really in additional costs. You do not have the pressure to hold down your costs when you do not go competitive. You have a tendency to push your overhead into the Government sector from your private sector operations. And you have all kinds of other reasons to hold onto your manpower when you have less competition and not the pressure and discipline of competition.

Mr. MENDOLIA. That was going to be my second point. To me the thing that the competition does is that it causes each of the competitors to improve his process to reduce cost, and thereby comes the cost reduction. What I would hate to see implied is that there is a 30- or 40-percent profit that suddenly disappears simply because you introduce competition. It is hard to deny that competition is a very effective force.

Chairman PROXMIRE. Will you give us a complete written reply to the Yuspeh study?

Mr. MENDOLIA. We would be delighted to.

Chairman PROXMIRE. And also provide us with similar examples of competitive buys following sole-source awards over the past 5 years.

Mr. MENDOLIA. Fine.

[The following information was subsequently supplied for the record:]

ASSISTANT SECRETARY OF DEFENSE,  
Washington, D.C., January 30, 1974.

HON. WILLIAM PROXMIRE,  
Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee, U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: During the hearings held on November 16, 1973, you asked for our comments on the study prepared by Mr. Larry Yuspeh, titled "The General Advantages of Competitive Procurement Over Sole Source Negotiation in the Department of Defense." The general thrust of the study is that competitive procurement is often more advantageous than continued sole source procurement of some items. We agree that examples can be found to illustrate this premise. Those cited by Mr. Yuspeh, while containing many technical errors, illustrate this point. However, these twenty cases are not a basis to assume that the vast majority of technologically complex items can be obtained through price competition, nor are they a basis to assume that significant price reductions can be made quickly or without risk to both the buyer and the seller when price competition is introduced.

It is well known that the cost of production of a repetitively manufactured item will decline as more and more items are produced. This is usually described as the progress-curve or learning-curve effect. Thus prices can be expected to decline on successive procurements even though competition is not present. This result is illustrated by the seven cases listed in Tab A.

The decision concerning whether an item can economically be competed is very complex. Almost every item in a major system is affected to some extent

by competition—be it technical competition, price competition, or a combination. What is not always clearly understood is the difficulty of obtaining price competition on the basis of technical data obtained as a result of technical competition.

The Department of Defense is aware of the benefits of competition and has long favored its use where appropriate. On balance, we believe that our current methods of selecting items for competition are adequate.

You have asked for other cases similar to the ones used in the Yuspeh Report. Tab B contains eighteen cases using the same format as shown in Tab A.

Sincerely,

ARTHUR I. MENDOLIA,  
*Assistant Secretary of Defense.*

#### TAB A

##### FORMAT FOR PRICE HISTORY OF SELECTED MILITARY EQUIPMENT

1. Reason for Selection: (Yuspeh Report, other competitive, or other non-competitive.)
2. Description of System or Sub-System and its end use: (Show military designator and if a sub-system the major systems which use the item.)
3. Buying Activity: (Purchasing Office identification.)
4. History of Development: (Brief Description of how the item was developed. Include contractors involved in the development, contract numbers, contract types, contract amounts, and any other pertinent data.)
5. Acquisition of Re-Procurement Data Package: (Describe the data package acquired, how much it cost, how it was acquired, what if any data rights problems were involved and the usefulness as a re-procurement package. If not acquired explain this decision.)
6. Production Procurement History—include:
  - a. Contractors
  - b. Types of Contracts
  - c. Contract Numbers and dates of Contracts
  - d. Quantity of End Items on each Contract
  - e. Delivery Schedule by Fiscal Year
  - f. Total Contract Value
  - g. Unit Price of End Items
  - h. Description and Value of Items or Services other than End Items on each Contract
  - i. Non-recurring Cost included in End Item Unit Price—such as Development or Tooling
  - j. Subsequent Claims or Termination Charges: (Describe)
  - k. Service Comments: (on the Pricing History, Delivery Accomplishment or Contractor Performance.)

##### A-6A INTRUDER

1. *Reasons for Selection.*—Non competitive.
2. *Description of System* or Sub-System and its end use.—The A-6A is a carrier based all weather attack aircraft designed to fly long distances at night, find and attack moving and stationary targets and return to its land or carrier base without aid of external navigational references.
3. *Buying Activity.*—Naval Air Systems Command.
4. *History of Development.*—Development of the A-6A aircraft commenced in April 1959 following a design competition between Martin, Douglas, Vought and Boeing. Grumman was determined to have submitted the best design and was awarded Contract NCw59-0259e for design and development of eight (8) aircraft. The cost of the contract was approximately \$149,269,000.
5. *Acquisition of Reprocurement Data Package.*—No reprocurement data package was procured.
6. *Production Procurement History.*—See next page.

A-6A INTRUDER

	Now(A)63-0126-i	Now(A)62-0349-i	Now(A)61-0024-i	Now(A)66-0058-1
Contractor.....	Grumman.....	Grumman.....	Grumman.....	Grumman.....
Contract type.....	Fixed price incentive.....	Fixed price incentive.....	Fixed price incentive.....	Fixed price incentive.....
Contract No. and date.....	Now(A)63-0126-i, June 6, 1963.	Now(A)62-0349-i, Jan. 11, 1962.	Now(A)61-0024-i, Nov. 7, 1960.	Now(A)66-0058-1, June 30, 1966.
End items quantity.....	48.....	24.....	48.....	112.....
Delivery schedule.....	15, fiscal year 1964; 24, fiscal year 1965.	12, fiscal year 1963; 12, fiscal year 1964.	6, fiscal year 1962; 6, fiscal year 1963.	56, fiscal year 1967; 56, fiscal year 1968.
Total contract value.....	\$127,213,102.	\$107,678,888.	\$72,501,673.	\$249,010,423.
End item unit price.....	\$2,923,000.	\$4,370,000.	\$5,725,000.	\$2,223,000.
Other than end item and value.....	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$1,926,830—design data engineering drawings, tests.	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$2,804,440—design data, engineering drawings, tests.	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment, mobile trainer. Value—\$3,800,000 mobile trainer (design data, engineering drawings, bill of material included in price of airframe).	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$1,912,976—design data, engineering drawings and test.
† Nonrecurring cost per unit:.....	None.....	None.....	None.....	None.....
Subsequent claims/termination charges.....	Satisfactory.....	Satisfactory.....	Satisfactory.....	Satisfactory.....
Service comments.....				
Contractor.....	Grumman.....	Grumman.....	Grumman.....	Grumman.....
Contract type.....	Fixed price incentive.....	Fixed price incentive.....	Fixed price incentive.....	Fixed price incentive.....
Contract No. and date.....	Now(A)65-0049f, Dec. 25, 1964.	Now(A)65-0049f, Dec. 25, 1964.	Now(A)64-0077f, Feb. 20, 1964.	Now(A)65-0049f, Dec. 25, 1964.
End items quantity.....	64.....	64.....	48.....	64.....
Delivery schedule.....	30, fiscal year 1966; 34, fiscal year 1967.	30, fiscal year 1966; 34, fiscal year 1967.	24, fiscal year 65; 24, fiscal year 1966.	56, fiscal year 1967; 56, fiscal year 1968.
Total contract value.....	\$162,494,556.	\$162,494,556.	\$130,849,304.	\$249,010,423.
End item unit price.....	\$2,500,000.	\$2,500,000.	\$2,687,000.	\$2,223,000.
Other than end item and value.....	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$1,912,976—design data, engineering drawings and test.	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$1,912,976—design data, engineering drawings and test.	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment, mobile trainer. Value—\$3,800,000 mobile trainer (design data, engineering drawings, bill of material included in price of airframe).	Design data, engineering drawings, bill of material, factory training, spare/repair parts, special support equipment. Value—\$1,912,976—design data, engineering drawings and test.
† Nonrecurring cost per unit:.....	None.....	None.....	None.....	None.....
Subsequent claims/termination charges.....	Satisfactory.....	Satisfactory.....	Satisfactory.....	Satisfactory.....
Service comments.....				

A-6A INTRUDER—Continued  
A-6A INTRUDER

	N00019-67-C-0185	N00019-68-C-0106	N00019-69-C-0075
Contractor.....	Grumman.....	Grumman.....	Grumman.....
Contract type.....	Firm fixed price.....	Firm fixed price.....	Firm fixed price.....
Contract No. and date.....	N00019-67-C-0185, Apr. 14, 1967.....	N00019-68-C-0106, Apr. 30, 1968.....	N00019-69-C-0075, Dec. 19, 1969.....
End items quantity.....	63.....	78.....	36.....
Delivery schedule.....	15, fiscal year 1968; 48, fiscal year 1969.....	42, fiscal year 1969; 36, fiscal year 1970.....	18, fiscal year 1970; 18, fiscal year 1971.....
Total contract value.....	\$136,082,000.....	\$179,226,000.....	\$89,429,030.....
End item unit price.....	\$2,171,000.....	\$2,298,000.....	\$2,484,130.....
Other than end item and value.....	Value—0—design data, engineering drawing, tests, bill of material included in unit price of airframe.....	Design data, engineering drawings, bill of material, port equipment, Value—0—design data, engineering drawings, tests, bill of material included in unit price of airframe.....	Design data, engineering drawings, bill of material, port equipment, Value—0—design data, engineering drawings, tests, bill of material included in unit price of airframe.....
Nonrecurring cost per unit:	None.....	None.....	None.....
Subsequent claims/termination charges.....	Satisfactory.....	Satisfactory.....	Satisfactory.....
Service comments.....			

## CONTRACT DATA ON AN/UYPK-7 PROCUREMENT HISTORY

*A. Reason for selection*

Solo source procurement that has shown a substantial price decrease.

*B. Description of system and its end use*

The AN/UYPK-7 is a modular, militarized, general purpose computer. This computer, in various configurations, is being utilized by the U.S. Navy, U.S. Marine Corps, U.S. Army and U.S. Air Force. It is used in many major weapons systems and subsystems. Examples of its use are the Trident Sonar, SSN 688's, PF's, PHM's, LHA's, SC3, AEGIS, JPTDS, AN/BQQ-5, MK-113, AN/TPS-59 (MC), TIPI (USAF), AN/TPQ-27 (USAF), U.S. Army Security classified programs.

*C. Buying activity*

The buying activity is the Naval Ship Systems Command, Department of the Navy.

*D. History of development*

Under contracts NOW 66-063 awarded on 24 June 1966 and NOOO24-67-C-1361 awarded on 28 April 1967, the UNIVAC Division of the Sperry Rand Corporation (UNIVAC) developed the CP-901 computer for use in the ANEW project, and the AN/UYPK-8 microelectronics computer for use with the AN/TYA-20. The contractual costs of these developments were approximately \$12,000,000. Early in FY 1967, DDR&E approved the development of a general purpose modular computer. Hughes Aircraft Corporation, Litton Industries, IBM Corporation, Control Data Corporation and UNIVAC were evaluated as possible developers. The final decision was to have UNIVAC develop the computer utilizing the techniques proven under contracts NOW 66-063 and NOOO24-67-C-1361. On 11 January 1968, a CPIF contract, NOOO24-68-C-1107, was awarded to UNIVAC to design, develop, test, and furnish 2 advance development models of an AN/UYPK-7 computer with associated repair parts, engineering services and support, and technical documentation and reports. The contract called for Category A, Type II, Form 2, MIL-D-1000 engineering drawings and also for UNIVAC to provide assistance when and if it was later determined to use the leader-follower procurement approach. The contract value was \$1,620,668. On 12 August 1969, a FP contract, NOOO24-69-C-1402, was awarded to UNIVAC for the production of the equivalent of 31 single bays. Since this first FP contract, UNIVAC has been awarded 8 additional FP contracts for the equivalent of 200 single bays. In conjunction with other authorized contracts, UNIVAC has produced approximately 200 single bays and has presently proposed production thru 439 single bays.

*E. Acquisition of re-procurement data package*

Data intended for competitive procurement is currently available. However, until the data is verified and validated, there is no assurance that identical equipment can be produced from this data. Identity of this equipment is considered essential. As this data has been acquired over many contracts it is not possible to ascertain its "COST".

*F. Production procurement history*

The AN/UYPK-7 can be procured in many configurations. The basic configuration consists of one cabinet, one central processor unit, one input/output adapter containing three sets of slow interface cards and one set of fast negative interface cards, one input/output controller unit, three memory units, one power supply and one maintenance console. This is known as a one bay, or "1-1-3-1" configuration. Due to the many configurations in which the AN/UYPK-7 is procured, the comparison of the average price per bay from the various contracts is not valid. The only valid comparison is of the "1-1-3-1" negotiated prices.

All production contracts have been firm fixed price contracts.

There are no non-recurring costs included in any of the "1-1-3-1" negotiated prices for the production contracts.

1. NOOO24-69-C-1402
  - a. Awarded 12 August 1969.
  - b. Contract for 17 Computer systems containing a total of 31 bays.
  - c. Deliveries: 15 bays in FY '70, 5 bays in FY '71, 11 bays in FY '72.
  - d. Total Contract Value—\$20,300,240.35.
  - e. "1-1-3-1" negotiated price—\$533,290.00.
  - f. Other items in contract: Equipment repair parts—\$1,330,407, engineering services—\$65,520, nonrecurring development costs—\$1,500,000.

2. NOOO24-71-1039
  - a. Awarded 9 October 1970.
  - b. Contract for 42 Computer systems containing a total of 47 bays.
  - c. Deliveries: 23 bays in FY '71, 16 bays in FY '72, 8 bays in FY '73.
  - d. Total Contract Value—\$20,919,297.00.
  - e. "1-1-3-1" negotiated price—\$294,500.00.
  - f. Other items in contract: Retrofit of previously delivered AN/UYK-7's—\$581,900, equipment repair parts—\$1,783,531, engineering services—\$1,254,324, spares, tools and extra modules—\$1,303,129.
3. NOOO24-72-C-1225.
  - a. Awarded 30 December 1971.
  - b. Contract for 1 Computer system containing a total of 3 bays.
  - c. Deliveries: 30 bays in FY '72.
  - d. Total Contract Value—\$438,477.00.
  - e. "1-1-3-1" negotiated price—\$294,500.00.
  - f. Other items in contract: Spares—\$23,012, retrofit—\$8,000.
4. NOOO24-72-C-1256.
  - a. Awarded 31 March 1972.
  - b. Contract for 2 Computer systems containing a total of 2 bays.
  - c. Deliveries: 2 bays in FY '73.
  - d. Total Contract Value—\$1,271,309.00.
  - e. "1-1-3-1" negotiated price—\$294,500.00.
  - f. Other items in contract: Equipment repair parts—\$125,299, engineering services—\$30,527, training courses—\$496,516, retrofit—\$20,000, tools—\$3,812.
5. NOOO24-72-C-1327.
  - a. Awarded 31 March 1972.
  - b. Contract for 15 Computer systems containing a total of 19 bays.
  - c. Deliveries: 19 bays in FY '73.
  - d. Total Contract Value: \$6,026,050.00.
  - e. "1-1-3-1" negotiated price: \$294,500.00.
  - f. Other items in contract: Equipment repair parts—\$303,283, engineering services—\$63,971, spares and tools—\$244,141, retrofit—\$40,000.
6. NOOO24-73-C-1082.
  - a. Awarded 11 October 1972.
  - b. Contract for 4 Computer systems containing a total of 9 bays.
  - c. Deliveries: 9 bays in FY '73.
  - d. Total Contract Value: \$2,009,125.50.
  - e. "1-1-3-1" negotiated price: \$215,000.00.
  - f. Other items in contract: Equipment repair parts—\$137,363, engineering services—\$90,955, spares and tools—\$33,137, retrofit—\$30,000.
7. NOOO24-73-C-1109.
  - a. Awarded 18 December 1972.
  - b. Contract for 15 Computer systems containing a total of 28 bays.
  - c. Deliveries: 28 bays in FY '73.
  - d. Total Contract Value: \$4,537,959.00.
  - e. "1-1-3-1" negotiated price: \$215,000.00.
  - f. Other items in contract: Equipment repair parts—\$166,824, engineering services—\$130,162, spares and tools—\$109,635.
8. NOOO24-73-C-1234.
  - a. Awarded 30 March 1972.
  - b. Contract for 4 Computer systems containing a total of 10 bays.
  - c. Deliveries: 6 bays in FY '73, 4 bays in FY '74.
  - d. Total contract Value: \$1,622,106.00.
  - e. "1-1-3-1" negotiated price: \$215,000.00.
  - f. Other items in contract: Equipment repair parts—\$117,342, spares—\$62,022.
9. NOOO24-73-C-1327.
  - a. Letter Contract Awarded 27 June 1973.
  - b. Definitized Contract will be for 52 Computer systems containing a total of 88 bays.
    - c. Deliveries: 81 bays in FY '74, 6 bays in FY '75, 1 bay in FY '76.
    - d. Estimated Total Contract Value: \$23,129,526.00.
    - e. "1-1-3-1" negotiator's position: \$223,938.00.
    - f. Other items in contract (estimated value): Equipment repair parts—\$1,145,171, engineering services—\$1,873,372, spares and tools—\$463,048.

*G. Service comments on pricing history and contractor performance*

To date, UNIVAC has completed 8 production lots of the AN/UYK-7 consisting of approximately 214 bays. Lots I thru IV were manufactured in an old facility with a heavily labor oriented process. This period corresponds to contracts N00024-69-C-1402 and N00024-71-C-1093. Upon the urging, and with the technical assistance of the Navy, UNIVAC moved into a modern plant during Lot V and converted to a process that was much more automated. From Lots VI thru VIII, UNIVAC has doubled their production output and also their UYK-7 labor force. Throughout this period, the price per "1-1-3-1" has gone from \$533,290.00 to \$215,000.00. The \$215,000.00 price represents the negotiation of production Lot X. The negotiator's position for N00024-73-C-1327 represents the pricing of production from June 1974 thru August 1975. AN/UYK-7 computers are bought on a next unsold production lot basis but may be delivered from a different production build lot. UNIVAC has built computers in advance of contract and has committed substantial company funds to this effort. This pre-contract building has enabled the Navy to get delivery on urgent requirements as soon as 30 days after contract award.

It should also be noted that the "1-1-3-1" price negotiated today, even if converted to constant dollars, is probably not directly comparable to the "1-1-3-1" prices previously negotiated. The AN/UYK-7 computer has changed from what it was under N00024-69-C-1402. To date there have been 85 approved engineering changes, 48 approved deviations and 11 approved waivers. An additional 37 engineering changes are presently being reviewed. While it is impossible to determine the exact impact of these changes on the price of the AN/UYK-7, the fact that these changes have resulted in an estimated \$2,740,000 in retrofits is an indication that the AN/UYK-7 has become more costly to build.

Also, the support program for the AN/UYK-7 has been steadily increasing in scope. The price of this support program is contained in the "1-1-3-1" negotiated prices and is not separable. This program consists of Configuration Management, Reliability Support, Program Management, Design Engineering, System Engineering, and User Liaison. As more AN/UYK's are built and delivered, there are more users, more problems, and the support program becomes larger. This increase in scope tends to increase the "1-1-3-1" price.

There have also been contracts directly between UNIVAC and civilian contractors for production of AN/UYK-7's. These contracts were authorized by the Navy. No information is available on these contracts as to negotiated "1-1-3-1" prices and therefore no information is provided on them as no valid comparisons could be made.

1. *Reason for Selection.*—Other Non-Competitive.

2. *Description of System or Sub-System and Its End Use.*—The equipment is the OE-82/WSC-1(V) antenna. The OE-82/WSC-1 is an Ultra High Frequency (UHF) SATCOM antenna system consisting of two steerable antennas. It is a part of the AN/WSC-1(V), a UHF SATCOM terminal (shipboard). The OE-82/WSC-1 antenna systems are also used with the AN/WSC-3 UHF satellite transceivers.

3. *Buying Activity.*—Naval Electronic Systems Command, Washington, D.C. 20360.

4. *History of Development.*—Six antennas were originally designed and developed by Collins Radio under A. F. Contract F-18628-67-C-0340 (cost type) awarded in May 1967 for UHF radios (award based on price and technical competition). The antennas (3 dual and 3 single) were added to the contract (subsequent to the competitive award of the radios) at a unit cost of \$350,000.

5. *Acquisition of Re-Procurement Data Package.*—

a. A reprourement data package was procured under the first production procurement under Navy Contract N00039-71-C-0030.

The data package has not been verified as to its usefulness for competitive procurement. Due to changes in the design to provide compatibility with the AN/WSC-3 and to lower production costs, the modifications impacted on the validity of such drawings; the changes were as follows:

- (a) Pedestals to be cast vs. machining
- (b) Cable wrap vs. slip ring on elevation
- (c) Deck box larger and incorporates power supply
- (d) Addition of T/R switch in deck box
- (e) Change in requirements to include both EMP (Electromagnetic Pulse) and TREE (Transient Radiation Electron Effects) and Nuclear Airblast
- (f) Lower power handling requirements, i.e., 200 watts vs. 5 KW

Under Contract N00039-73-C-0046, updated data package is to be furnished February 1974. Such data is expected to be adequate for future competitive procurement if additional requirements are generated.

6. *Production Procurement History.*—

a. Only one contractor, Collins Radio Co., Cedar Rapids, Iowa, is involved. The production contracts awarded are as follows:

b./c. N00039-71-C-0030, Firm Fixed Price, 5 April 1971; N00039-72-C-0150, Firm Fixed Price, 8 March 1972; N00039-73-C-0046, Firm Fixed Price, 26 January 1973.

d. 11 dual antennas as part of AN/WSC-1 plus 1 separate; 18; Phase I, 50—Firm, FY 73; Phase II, 100—Opt., FY 74; Phase III, 92—Opt., FY 75.

e. Delivery Schedules: 7 FY 72, 5 FY 73, 12 FY 73, 6 FY 74, 42 FY 74, 84 FY 75, 84 FY 76, 32 FY 77.

f. Total Contract Value (Basic)—\$2,050,000; \$4,281,993. Phase I—\$3,380,290, Phase II—\$4,161,653, Phase III—\$3,925,051. (Note Total Firm Fixed Priced Items—\$9,652,425, Est. Items—\$1,814,570, Total (Est.)—\$11,466,994.

g. Unit Price End Item—The Antenna: 11 dual antenna systems included with AN/WSC-1, 18 @ \$41,750 ea. (\$751,500 Total for 18), Phase I—\$420,546\*, 49 @ \$25,292 (\$1,239,308—Total). Phase II—100 @ \$22,307.19 (\$2,230,719—Total). Phase III—92 @ \$23,310 (\$2,144,520).

1 antenna subsystem separately priced—\$69,613 unit price.

h. Other Items and Services Other Than Antenna: AN/WSC-1(V) UHF SATCOM Terminal, repair parts, field change kits, special tools, interface system, data, accessories.

AN/WSC-5(V) SATCOM Terminals (18) tech manuals, data, reports, repair parts, mod kits, services, channel configurations on WSC-5; tools and cables for AN/WSC-5.

Reliability Testing RF Filter Boxes and Bulkhead kits, manuals, data, reports, repair parts, depot, inspection and repair, services, training program and services.

i. Non-recurring costs in end item—unit price: None; None; \$395,276—non-recurring costs due to reconfiguration for use with AN/WSC-3; includes change from milled pedestal to cast pedestal.

j. Claims or Terminations: None; None; None.

k. Comments:

(1) Pricing History—Good for all contracts.

(2) Delivery History—Overall satisfactory.

(3) Performance—Systems have been service approved and the contractor's equipments are meeting requirements.

#### TARGET IDENTIFICATION SYSTEM ELECTRO-OPTICAL (TISEO)

##### A. *Category 2*

##### B. *Description*

Target Identification System Electro-Optical (TISEO), Military Designation—AN/ASX-1

A complex, airborne electro-optical device used in F-4E aircraft which utilizes an optical system coupled to a television sensor. Features two instantaneous fields of view; a wide one for target acquisition and a narrow one for target recognition and identification. Provides information necessary to exploit the capability of sophisticated standoff weapons.

##### C. *Buying Activity*

Aeronautical Systems, Division, Deputy for Recon/Strike/Electronic Warfare, ASD/RWVK

##### D. *History of Development*

###### 1. Contract F33657-68-C-1073

Feasibility study of the design in a F-101 test bed aircraft. FFP type contract awarded Jul 68 in total amount of \$450,000 to Nortronics Division of Northrop Corp., Palos Verdes, Calif. System design for air-to-air application.

###### 2. Contract F33657-69-C-0536

\*Includes non-recurring costs, due to reconf. for WSC-3—Milled pedestal to cast pedestal.

Contract for improvements to the design used in feasibility study. Contract later modified to incorporate an air-to-ground capability into the system design. This was an FFP type contract awarded in May 69 to Northrop Nortronics (later changed to Electro-Mechanical Div. (EMD) of Northrop Corp), Palos Verdes, Calif. Amount of award \$238,693; later increased to a total of \$376,951.

3. Contract F33657-69-C-0979

Contract for prototype TISEO equipments configured for an F-4E aircraft. Contract called for contractor-conducted environmental testing and an Air Force-conducted Cat II flight test program. FFP type in amount of \$3,330,000 awarded to Northrop EMD, Anaheim, Calif. in Nov 69.

*E. Acquisition of Reprocurement Data Package*

Not acquired due to proprietary nature of critical parts of the TISEO system. Northrop's price for data with unlimited rights was \$30,000,000. Offer considered excessive and decision was made not to purchase reprocurement data.

*F. Production procurement history*

All production contracts placed sole-source with Northrop EMD, Anaheim, Calif.

1. Contract F33657-71-C-0783.

FFIF type contract awarded Dec 71 for total negotiated value of \$14,471,205<sup>1</sup> for 86 systems plus spares (19 equivalent systems). Final value not yet available. System prices were negotiated for three lot sizes:

7 @ \$113,444 per system (Qual Test Systems); 43 @ \$100,158 per system; 36 @ \$82,108 per system.

Delivery of equipments by fiscal year are: FY-72 (12 systems), FY-73 (74 systems).

2. Contract F33657-73-C-0155

FFP type contract awarded for Jan 73 in total amount of \$1,271,604 for 13 systems plus some spare LRUs (total equivalent to 16 systems, including the 13). Negotiated system price was \$81,824.

Delivery of equipments by fiscal year are: FY-73 (3 systems), FY-74 (13 systems & spares).

3. Contract F33657-73-C-0660

FFP type contract awarded May 73 for 48 systems in total amount of \$3,618,000. Negotiated system price was \$75,375.

Delivery of equipments by fiscal year are: Scheduled FY-74 (24 systems), FY-75 (24 systems).

4. Contract F33657-74-C-0285

Negotiations on this procurement were concluded on 10 Dec 73 for 108 systems at a total amount of \$7,622,244. Eighty-four of the systems were for Foreign Military Sales and twenty-four for U.S. Air Force. System prices negotiated were: (USAF) 24 each at \$67,725, (FMS) 84 each at \$71,391. Contract distribution is forecasted for Jan 74.

Deliveries of systems by fiscal years are: Scheduled FY-75 (62 systems), FY-76 (46 systems).

A. Procurement is Category 2 (Sole Source With Price Reduction).

B. Description of System: Electro-Optical Guided Bomb Kit providing terminal guidance for standard iron bombs. Production of kits for other than the MK-84 (2000 lb) bomb has been insignificant and is not addressed herein.

Weapon System, WS-213; military designation, KMU-353A/B; bomb used, MK-84 (2000 lb).

C. Buying Activity: Armament Development and Test Center, Guided Bombs System Program Office, Procurement/Production Division, Eglin AFB FL.

D. History of Development: Development of the Electro-Optical Guided Munitions System was initiated by the Air Force Armament Laboratory in 1967. Two sources, North American Rockwell Corporation (name later changed to Rockwell International Corporation) and Texas Instruments, Inc., were solicited and proposed. North American was selected and awarded letter Contract FO8635-68-C-007 in August 1967. This letter contract was for a study and was later defined as Contract F33657-68-C-0623. All follow-on contracts have been awarded to Rockwell International Corporation due to time and data constraints. The first production contract (F33657-69-C-0400) was awarded 14 March 1969.

<sup>1</sup> Includes total non-recurring negotiated price of \$4,463,493.

## CONTRACTUAL DEVELOPMENT HISTORY

Contract	Date	Type	Amount	Quantity
F33657-68-C-0623	August 1967	CPIF	\$9,564,000	66
F33657-68-C-0052	April 1968	CPIF	2,213,000	36
F33657-68-C-0870	do.	FFIF	3,707,000	80

E. Acquisition of Reprocurement Data Package: A reprocurement data package has not been procured for this program due to the rapidly changing baseline, lack of funding and program direction. Events have proved this decision correct since a reprocurement package based on existing systems would permit competition only for an outdated system significantly inferior to the present system. This is true from both an economic and operational point of view. It is anticipated that the FY 75 production procurement of this system will purchase a complete reprocurement package of real use for competing follow-on procurements. Competitive reprocurement, of course, will require adequate program direction/funding lead time.

F. Production Procurement History of the Electro-Optical Guided Bomb Kit.

(1) Contractor: Rockwell International Corporation.

(2) through (9): See attached tabulation.

(10) There have been no subsequent claims or termination charges.

(11) ADTC Comments: Rockwell International Corporation has performed in a satisfactory manner. This system is more complex than Laser Systems and was deployed very early in its evolution to meet urgent Southeast Asia operational requirements. Very significant improvement has been characteristic of each succeeding contract. The system is only now reaching the point where a relatively stable baseline can be expected. These many improvements have greatly increased operational usefulness of the system and tended to push costs up. Yet the price has trended downward despite this significant operational improvement. This system shows promise of becoming our "front line" defense suppression munition. The economic advantages probable are very large due to the reduced losses of strike aircraft and crews. The performance of the contractor has been cost efficient especially in light of the improvements made. Witness the cost reduction in absolute terms:

Kit, KMU-353A/B; Cost Reduction (1969 thru 1973), 16 percent.

The performance of Rockwell International in the sole source environment is not typified by the common conceptions of what normally occurs in such situations. They successfully developed and permitted deployment of an urgently required operational capability in absolute minimum time in a wartime environment. Significant national benefits were and are being derived from these efforts. They did so efficiently and economically. Quantities of production have been relatively low and further significant unit price decreases are probable when and if significantly increased quantities are purchased. Simply by applying a conservative 20% inflation growth over the four years time frame the cost reduction becomes more dramatic.

Kit, KMU-353A/B: Cost Reduction (1969 thru 1973), 30 percent.

Competitive reprocurement of this system has not been possible due to urgent time constraints, primarily. However, it is pure conjecture that competition would have afforded a better cost history. These time constraints are being reduced and the system baseline is firming. Unit prices will trend further downward in the future especially if quantities are increased. Competitive reprocurement will be possible in the future and may contribute to decreased unit prices.

A. Procurement is Category 2 (Sole Source With Price Reduction).

B. Description of System: Laser Guided Bomb Kits providing terminal guidance for standard iron bombs. Three kits, tailored to three different bombs, are involved:

Weapon system	Military designation	Bomb used
WS-212B	KMU-351B	MK-84 (2,000 lb.)
WS-212C	KMU-370B	MK-118 (3,000 lb.)
WS-212D	KMU-388B	MK-82 (500 lb.)

C. Buying Activity: Armament Development and Test Center, Guided Bombs System Program Office, Procurement/Production Division, Eglin AFB FL.

D. The Laser Guided Bomb Program was initiated by the Air Force Armament Laboratory in 1965. Industry was solicited for Advanced Development proposals of such a guidance system. Two responses, North American Aeronutronics and Texas Instruments, were received. These two contractors were awarded Advanced Development contracts for competitive demonstration at Eglin AFB FL.

Contractor	Contract	Type	Amount	Date	Quantity
North American.....	F08(635)5612	FFP.....	\$449,637	November 1965	5
Texas Instruments.....	F08(635)5526	FFP.....	266,346	do.....	9

Competitive demonstrations/validation resulted in the Armament Laboratory determining that both systems were worthy, of further development. However, funds were provided only for further development of the Texas Instruments system. Further engineering development, testing and/or pilot production leading up to award of the initial production contract (F33657-68-C-1121), was accomplished by the following contracts:

Contract	Date	Amount	System	Quantity
F08635-67-C-0080 (CPIF).....	March 1967.....	\$2,332,645	342/351	60
F33657-68-C-0308 (FPIF).....	September 1967.....	1,302,088	342/351	83
F33657-68-C-0739 (FPIF).....	February 1968.....	1,960,250	342	200
F33657-69-C-0507 (FPIF).....	November 1968.....	804,987	370	17
F33657-69-C-0840 (FPIF).....	January 1969.....	279,434	370	20

#### E. Acquisition of Reprocurement Data Package.

A reprourement data package was purchased under the initial production contract (F33657-68-C-1121) for \$88,000. However, due to a very rapid refinement of the system and efforts to lower costs, each succeeding contract has modified this data package. The total cost of these modifications has been \$332,500 through Contract F08635-73-C-0004 dated September 1972.

Total cost of this reprourement package is \$420,500. The entire package is being provided AFLC for future competitive procurement. However, its usefulness as a reprourement data package is questionable since no procurement of this system baseline is anticipated. Contract F08635-73-C-0111 (CPIF) with Texas Instruments dated April 1973, for production engineering of a vastly improved system, purchases a complete reprourement data package for about \$122,000. Assuming adequate program direction/funding lead time, this data package could be used for competitive procurement of FY 76 production. It should be pointed out that production of Laser Guidance Kits followed competitive demonstration at the advanced development stage and all future contracts have been awarded to Texas Instruments primarily due to the operational success of the system and its rapid deployment to Southeast Asia. Time was not available to freeze the system baseline and go competitive due to recurring urgent operational requirements for Southeast Asia. For similar reasons and rapid product improvement, both operationally and cost wise, data has not been available for competition. This urgency has now decreased to the point where competitive procurement could be possible for FY 76 provided adequate procurement lead time is provided.

#### F. Production Procurement History of Laser Guided Bomb Kits.

- (1) Contractor: Texas Instruments, Inc.
- (2) through (9) See attached tabulation.
- (10) There have been no subsequent claims or termination charges.
- (11) ADTC Comments: Texas Instruments has performed in an excellent manner. Certainly this Laser Guided Bomb Program is widely considered an outstanding, perhaps unique, operational success but even more importantly their performance has been consistently cost efficient. Witness these cost reductions in absolute terms:

*Cost reduction, 1968-73*

Kit:		Percent
KMU-351B	-----	50
KMU-370B	-----	42
KMU-388B	-----	50

This has been done even though the product was consistently improved, quantities were changed frequently during contract performance and rapid inflation was prevalent. Simply by applying a conservative inflation growth of 25% over the five year time frame the cost reduction becomes even more dramatic.

*Cost reduction, assuming 25 percent inflation 1968-73*

Kit:		Percent
KMU-351B	-----	59
KMU-370B	-----	54
KMU-388B	-----	60

The performance of Texas Instruments in the sole source environment is not typified by the common conceptions of what normally occurs in such situations. Not only have they produced efficiently, but of greater economic significance is the economies of employing Guided Bombs versus Unguided Bombs. They successfully developed and permitted operational deployment of these systems during a wartime environment. Significantly improved operational efficiency was provided to meet urgent national needs and this was done economically benefitting both the Government and contractor.

## PAR. 2F, SUBPARS. (2) THROUGH (9)

Type contract	Contract/date	Quantity	Delivery schedule	Total contract value	Unit price	Other items/cost	Nonrecurring costs in unit price
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FPIF.....	F33657-69-C-0400 March 1969.....	444	Fiscal year 1970, 404; fiscal year 1971, 40.	\$19,550,745	\$16,704	\$7,147,045 for pilot production (18 units), engineering development and tooling. \$4,987,124 for AGE and AGE testing, flight testing, data, dummy kits, training, phase I qualification product improvement and reusable containers.	0
FPIF.....	F33657-70-C-0336 October 1969.....	980	Fiscal year 1971, 980	16,377,369	\$13,750	\$2,581,639 for technical services, umbilicals, reliability testing, A-7D interface study, test equipment, data, and AGE. \$320,730 was for 30 each production units of the M-118 (FACI).	0
FPIF.....	F08635-71-C-0026 September 1970.....	867	Fiscal year 1971, 80; fiscal year 1972, 787.	13,429,269	\$12,841.75	\$2,295,470 for RAT, retrofit, technical services, AGE, and data.	0
FPIF.....	F08635-72-C-0015 August 1971.....	725	Fiscal year 1972, 130; fiscal year 1973, 595.	12,484,967	\$13,946.74	\$2,373,577 for RAT, retrofit, technical services, AGE, data, training, and reusable containers.	0
FPIF.....	F08635-73-C-0010 August 1972.....	770	Fiscal year 1973, 190; fiscal year 1974, 580.	11,475,461	\$14,040	\$664,751 for RAT, technical services, data, and AGE.	0
FPIF.....	F33657-68-C-1121 May 1968.....	3,400	KMU-351B: Fiscal 1969, 900; Fiscal year 1970, 2,500.	17,640,000	4,833.33	\$1,207,209 for AGE, data and reliability program.	\$54
FPIF.....	F33657-70-C-0254 October 1969.....	6,123	KMU-351B: Fiscal year 1970, 975; Fiscal year 1971, 4,225; Fiscal year 1972, 2,500.	28,318,054	KMU-351B: \$4,172.	\$2,375,090 for KMU-388 prototypes, AGE, data, reliability program, and technica services.	178
			KMU-370B: Fiscal year 1970, 268; Fiscal year 1971, 310.		KMU-370B: \$4,588.		178
			KMU-388B: Fiscal year 1970, 40; Fiscal year 1971, 310.		KMU-388B: \$4,562.		18
FPIF.....	F33657-71-C-0041 July 1970.....	11,990	KMU-351B: Fiscal year 1971, 1,960; Fiscal year 1972, 4,330; KMU-370B: Fiscal year 1971, 170; Fiscal year 1972, 280; KMU-388B: Fiscal year 1971, 1,650; Fiscal year 1972, 3,600.	39,265,556	KMU-351B: \$3,050.	\$2,124,856 for AGE, data, reliability, technica services, with the majority (\$1,091,352) being VECF royalty payments.	0
					KMU-370B: \$3,281.		39
					KMU-388B: \$3,139.		



1. Reason for Selection: Items which has remained sole source, yet show price reductions in subsequent procurements.

2. Description of Items and End Use: FSN 6130-163-5081, charger battery, which is a component part of the modular engine test system used as support equipment to T53/55 engine.

3. Buying Activity: AVSCOM.

4. History of Development: This item was developed as a component of ground support equipment relative to T53/55 engine by the prime contractor AVCO, Lycoming Division.

5. Acquisition of Re-Procurement Data Package: This item was procured from a Christie Electric Corporation Catalog Commercial price list. There has been no acquisition of re-procurement data package.

6. Production Procurement History: See below.

	Sole source procurement, fiscal year 1973	Sole source procure- ment, fiscal year 1974
(a) Contractors	Christie Electric Corp.	Christie Electric Corp.
(b) Types of contracts	FFP	FFP
(c) Contract Nos.	DAAJ01-73-C-0197	DAAJ01-74-C-0110
(d) Contract dates	Oct. 30, 1972	Sept. 26, 1973.
(e) Delivery schedule	90 days after receipt of order.	
(f) Total contract value	\$6,516	\$10,620.
(g) Unit price of end items	\$1,086	\$1,062.
(h) Description and value of items or services other than end items on each contract.	No other item on contract.	No other item on contract.
(i) Nonrecurring cost		
(j) Subsequent claims or termination charges	None	None.
(k) Service comments	Adequate	Adequate.

TAB B

## CONTRACT DATA—TOW MISSILE

1. Reason for Selection: The TOW Missile was selected as an example of changing from sole source to competitive procurement. Its selection was due to the unique method employed in introducing competition (establishment of a second source), the application of "should cost" techniques in the procurement, and the substantial savings that resulted.

2. Description of System or Subsystem and its End Use: There are two types of TOW Missiles—Guided Missile, Surface Attack, Tactical, BGM 71 A (FSN 1410-087-1521) and Guided Missile, Surface Attack, Practice, BTM 71 A (FSN 1410-087-1527).

3. Buying Activity: USAMICOM.

4. History of Development: The TOW Weapon, designed by Hughes Aircraft Company, Culver City, CA, was selected from four anti-tank weapon concepts demonstrated under Government funding in 1962. TOW development was initiated under CPFF/CPIF contract DA-04-495-AMC-12Z dated 11, Oct 62, with Hughes as the prime contractor. Experimental firings were completed in Dec 1964 and advance production engineering was completed in Jul 1968. The initial production contract, DAAH01-68-C-2141, with Hughes was awarded on a sole source basis in Jun 1968, followed shortly thereafter in Jan 1969 with the competitive award of a small "education" quantity of 200 Missiles to Chrysler Corporation, the second source contractor, under contract DAAH01-69-C-0928.

5. Acquisition of Re-Procurement Data Package: The TOW Technical Data Package was generated under the several R. & D. and Engineering Services contracts with Hughes. Since generation and maintenance of this documentation was only a small part of the effort performed under each contract, the cost of this specific effort is not available.

6. Production Procurement History: 5 attachments.

## UNCLASSIFIED

DAAH01-68-C-2141

- a. Hughes Aircraft Co., Culver City, CA.  
 b. FPI (MY)  
 c. DAAH01-68-C-2141 28 Jun 68  
 d. 1st Year: 5,552 each 2nd Year: 13,063 each

	CY69					CY70											
	A	S	O	N	D	J	F	M	A	M	J	J	A	S			
FY69	25	50	75	100	125	200	300	418	513	601	700	740	790	915			
FY70	CY70			CY71											CY72		
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	
	915	915	915	915	915	915	915	915	915	916	916	915	636	600	600	600	560

- f. \$124,533,043  
 g. \$4,192  
 h. System Implementation \$15,900,000  
 i. Facility Items \$971,532.00  
 j. None  
 k. Contained Fly-to-buy performance incentives.  
 Required reliability range was 88 to 99%. Contractor attained 97.8%.

UNCLASSIFIED

DAAH01-69-C-0928

a. Chrysler Corp., Huntsville, AL

b. FFP

c. DAAH01-69-C-0928 10 Jan 69

d. Basic: 200 each Option : 2,685 each

	<u>CY70</u>				<u>CY71</u>					
	<u>S</u>	<u>O</u>	<u>N</u>	<u>D</u>	<u>J</u>	<u>F</u>	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>
FY69	5	15	24	24	24	23	22	22	21	20

	<u>CY71</u>						<u>CY72</u>
	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>	<u>N</u>	<u>D</u>	<u>J</u>
FY70	50	100	150	235	435	685	1030
OPT.							

f. \$18,424,395

g. Basic: \$16,494.44 Option: \$5,514.21

h. Data (priced separately) \$10,832

i. None.

j. None

k. Performance satisfactory

UNCLASSIFIED

DAAH01-71-C-0994 ;

- a. Hughes Aircraft Company, Culver City, CA  
 b. FFP  
 c. DAAH01-71-C-0994 29 Apr 71  
 d. 6,580 each

e.

CY72								
	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>
FY71	880	800	800	800	800	800	800	900

- f. \$24,091,584  
 g. \$3,629.66  
 h. SAIE Maintenance at subcontractors' plants common to both producers (Hughes and Chrysler) - \$29,870.  
 i. None  
 j. None  
 k. Split buy (high quantity award) contains fly-to-buy acceptance provisions. No lots were rejected.

## UNCLASSIFIED

DAAH01-71-C-0995

- a. Chrysler Corp., Huntsville, AL
- b. FFP
- c. DAAH01-71-C-0995      29 Apr 71
- d. 4,000 each

e

	CY72							
	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>
FY71	400	400	400	400	400	500	700	800

- f. \$16,364,370
- g. \$4,148.20
- h. None
- i. None
- j. Contract value includes a defective pricing claim reduction of \$228,500. Contractor has claim for approximately \$250,000 against Government on fly-to-buy performance acceptance requirement because of failed lots.
- k. Contains fly-to-buy acceptance provisions. Split buy (low quantity award).

DAAHO1-72-C-0418

- a. Hughes Aircraft Company, Culver City, CA.
- b. FP/Escalation (MY).
- c. DAAHO1-71-C-0418 19 Nov 71.
- d. Classified material.
- e. Classified material.
- f. [U] \$146,000,363.
- g. [U] \$2,091.30 (per contract).
- h. None.
- i. None.
- j. None.
- k. Contains fly-to-buy performance acceptance provisions. No lots rejected to date.
  1. Reason for Selection: Item which has changed from sole source to competitive.
  2. Description of Item and End Use: FSN 2840-944-2567, Seal Assembly, which is utilized in the compressor section of the Lycoming T53 Turbine Engine.
  3. Buying Activity: AVSCOM.
  4. History of Development: This item was developed as a component part of the T53 engine by the prime contractor, Lycoming.
  5. Acquisition of Re-procurement Data Package: Lycoming Source—Control 1-300-077 was acquired under AVSCOM Contract DAAJ01-68-C-0954 Individual Cost of data per line item is not available. No data rights problems have been encountered. The usefulness of the data as a re-procurement package is attested to by the savings experienced in moving from a sole source to a limited competitive position (see Procurement History below).
  6. Production Procurement History: See below.

	Sole-source procurement, fiscal year 1967	Competitive procurement, fiscal year 1974
(a) Contractor.....	AVCO, Lycoming Division.....	GIT Bros. Manufacturing Co.
(b) Type of contract.....	FFP (pricing formula).....	FFP.
(c) Contract number.....	F4-1608-0035182 D/O-0809.....	DAAJ01-74-D-0010.
(d) Contract date.....	Feb. 1, 1967.....	Aug. 8, 1973.
(e) Delivery schedule.....	Completed July 4, 1968.....	Due February 1974.
(f) Total contract value.....	\$11,219.60.....	\$15,625.
(g) Unit price of item.....	\$40.07.....	\$31.25.
(h) Description and value of other items on contract.....	No other line items.....	No other line items.
(i) Nonrecurring costs.....	None.....	None.
(j) Claims or termination.....	do.....	Do.
(k) Service comments.....	Adequate.....	Adequate.

1. Reason for Selection: Item which has changed from sole source to competitive.
2. Description of Item and End Use: FSN 1680-014-0717, Seat Assembly Fitting which holds the passenger seat of the UH-1 Helicopter in place.
3. Buying Activity: AVSCOM.
4. History of Development: This item was developed as a component part of the UH-1 Helicopter by the prime contractor, Bell Helicopter.
5. Acquisition of Re-procurement Data Package: Bell Helicopter drawing 205-070-764 was acquired under AVSCOM Contract No. DAAJ01-68-C-0566. Individual cost of data per line item is not available. Unlimited data rights were acquired under the contract. The usefulness of the data as a re-procurement package is attested to by the savings experienced in moving from a sole source to a fully competitive position (see procurement history below).
6. Production Procurement History: See below.

Sole source procurement fiscal year 68 Competitive procurement fiscal year 74

(a) Contractor	Bell Helicopter Co.	Aerial Machine & Tool Corp.
(b) Type of contracts	Fixed price, pricing formula	FFP
(c) Contract numbers	DAAJ01-68-A-0022, DO-3560	DAAJ01-74-C-0078.
(d) Contract dates	Dec. 13, 1968	Aug. 23, 1973.
(e) Delivery schedule	Complete Oct. 24, 1969	To be completed Mar. 21, 1974.
(f) Total contract value	\$8,093.68	\$13,521.25.
(g) Unit price of end item	\$10.43	\$6.25.
(h) Description of items and values of items or services other than end items.	No other item on contract	No other item on contract.
(i) Nonrecurring cost including end item unit price.	None	None.
(j) Subsequent claims or terminations	do	Do.
(k) Service comments	Adequate	Adequate.

## M16A1 RIFLE

- Reason for Selection : Shift from Sole Source to Competitive.
- Description of System : M16A1 Rifle.
- Buying Activity : US Army Armament Command—DAAA09.
- History of Development : Item is a commercially developed proprietary item with patents being held by Fairchild Hiller. Colt's Inc., has Exclusive License granted by Fairchild Hiller. Colt's in turn has granted a Non-Exclusive License to US Government.
- Army acquired Non-Exclusive License and Competitive TDP in 1967 at a cost of \$5.5M. License provided for payment of 5.5% Royalty to Colt's Inc.
- US Government procured Rifles sole source from Colt's Inc., during period 1967-1968. Four FFP Contracts totaling approximately 1.5M Rifles were placed during this period. Unit Price under last sole source contract covering quantity of 605,000 Rifles was \$104.00. In 1968 Competitive Solicitation was issued to establish two additional Mobilization Bases. Because of this Colt's Inc., was excluded. The first truly competitive procurement followed in 1969 with the two new Mobilization Base Producers (Hydramatic Division GMC and Harrington & Richardson) competing with Colt's for two awards. As a result Colt's previous \$104.00 Unit Price was driven down to \$89.81 on a quantity of 200,000 fewer Rifles (i.e. 408,000). The next truly competitive procurement occurred in 1970 when again the three Mobilization Base Producers competed for one contract on a quantity of 254,000 Rifles. Competition again drove Colt's price down to \$82.00 per unit and on a monthly delivery rate one half that of the previous contract.

## ANGRC-103 RADIO SET

- Other competitive.
- The radio set ANGR-103 is a light weight, general purpose radio relay equipment designed primarily for use in conjunction with pulse code modulation (PCM) multiplex equipment to transmit 6, 12, or 24 voice channels. The radio set a FM transmitter-receiver combination operating in the frequency range of 220-1000 MHz.
- Ft. Monmouth Procurement Branch, US Army Electronics Command.
- The radio set was developed under the US-Canada Development Sharing Agreement. A "zero dollar" contract, number 1008-PM-62-93-93 was awarded to Canadian Commercial Corp/Canadian Marconi Co. (CCC/CMC) in October 1961. It called for a design plan, four advanced development models, and 18 engineering models. The cost to the US Government was \$5 million. Engineering tests were completed in November 1966 and service tests were completed in September 1967.
- During 1968 the Government attempted to procure competitive data from CCC/CMC. On 31 November 1968, CCC/CMC submitted a proposal for unlimited

rights to their technical data. The CCC/CMC proposals were found unacceptable. Accordingly, the US Government decided to procure the radio set on a competitive basis using specifications developed by performing reverse engineering on previously procured units.

6. a. Contractor, CCC/CMC; Negotiated, Sole Source; Contract No., DAAB07-67-C-0168, dtd 30 Nov 1966; Qty, 400 ea, Band I; Total Contract Value, \$11,274,021; Unit Price of End Items, \$26,681; Other Items—Provisioning, \$601,621.

b. Contractor, CCC/CMC; Negotiated, Sole Source, Option quantity; Contract No., DAAB07-67-C-0168, dtd 31 Nov 67; Qty, 350 ea, Band I; Total Contract Value (Option), \$8,541,400; Unit Price of End Item, \$24,404.

c. Contractor, CCC/CMC; Negotiated, Sole Source; Contract No., DAAB07-68-C-0331, dtd 28 June 68; Qty, 115 ea, Band I; Total Contract Value, \$2,968,245.30; Unit Price of End Items, \$24,279.82.

d. Contractor, CCC/CMC; Negotiated, Sole Source; Contract No., DAAB07-69-C-0140, dtd 8 Feb 69; Qty, 550 ea, Band I; Total Contract Value, \$12,293,679; Unit Price of End Items, \$22,350; Other—Provisioning, \$1,179.

e. Contractor, CCC/CMC; Negotiated, Sole Source, Option Quantity; Contract No., DAAB07-69-C-0140, dtd 30 Sep 69; Qty, 631 ea, Band I; Total Contract Value (Option), \$10,231,034; Unit Price of End Items, \$16,214, Band I.

f. Contractor, CCC/CMC; Negotiated, Sole Source; Contract No., DAAB07-69-C-0141; Qty, 100 e; a. Band II; Unit Price of End Items, \$35,008.15; Qty, 100 ea, Band III; Unit Price of End Items, \$35,633.38; Total Contract Value, \$7,064,153.

g. Contractor, Magnavox Co.; Formal Advertising, Multiple Your Procurement;<sup>1</sup> Contract No., DAAB05-69-C-1332, dtd 25 June 69; Qty, 71 ea, Band I; Total Contract Value, \$1,384,367; Unit Price of End Items, \$9,977; Other: Provisioning, \$117,000; Drawings, \$376,000; Gauses, \$183,000.

h. Contractor, CCC/CMC; Negotiated, Competitive; Contract No., DAAB05-71-C-3716, dtd 18 Feb 71; Qty, 131 ea, Band II; Unit Price of End Items, \$11,204; Qty, 83 ea, Band III; Unit Price of End Items, \$11,204; Qty, 145 ea, Band III RF Heads; Unit Price of End Items, \$4,991; Total Contract Value, \$3,121,351.

i. Contractor, CCC/CMC; Negotiated, Competitive; Contract No., DAAB05-72-C-5512, dtd 24 May 72; Qty, 307 ea, Band III Fixed Heads; Total Contract Value, \$1,629,556; Unit Price of End Items, \$5,308.

j. Contractor, CCC/CMC; Negotiated, Sole Source; Contract No., DAAB05-73-C-0301, dtd 1 Aug 72; Qty, 216 ea, Band III RF Heads; Total Contract Value, \$1,379,592; Unit Price of End Items, \$6,387.

1. An example of price reduction resulting from competitive procurement.

2. The item in a 150 AMP Generator used in the main on the M41 "Walker Bulldog" tank. It is the main electrical generator for the family of vehicles utilizing the M41 configuration.

3. US Army Tank-Automotive Command, Procurement and Production Directorate, Procurement Support Division.

4. This generator was developed by Bendix Corporation for use with the continental engine for the M41 series vehicles. It had been sole source for Bendix's subsidiary the Euroka Williams Company from inception approximately 1943, until competition was obtained by the TACOM procuring element in July 1970 on Contract DAAB07-71-C-1056 which was awarded to a small business, Minowitz Manufacturing Company.

5. The negotiator developed an exceptional interest in this particular unit because of the increasing volume of procurements and the seemingly high unit price of \$795.00. A canvassing of electrical equipment manufacturers revealed an interest and the desire to be given an opportunity to be responsive to the needs of the DOD. Accordingly, a First Article Testing procedure was developed at the insistence of the negotiator and placed in a solicitation, thereby allowing interested contractors to compete responsively. The Technical Data Package including First Article Testing was developed at no additional cost by the Government; therefore, it can be used in reprocurments. At the time of award of the contract to Minowitz Manufacturing Company, July 1970, Bendix Corporation protested on the grounds that this was a proprietary item and as such, no other manufacturer could produce units without their permission. The award was upheld by the General Accounting Office in their decision of 9 June 1971, Number B-170297.

<sup>1</sup>Contract was cancelled because the second year was not funded in time. (Cancellation charges were \$1,436,847 and not included in total above.)

## 6. Production Procurement History :

a. Contractors were Bendix Corporation and Minowitz Manufacturing Company. Other contractors that offered proposals were Aircraft Parts Corporation and Napco Industries.

b. All contracts were of the Firm Fixed Price type with option. For items c, d, e, f, and g see attached chart.

Price History of Selected Military Item

h. Not applicable.

i. Non-recurring costs. In a component part procurement such as a generator when procured competitively on a Firm Fixed Price contract, it is difficult, if not impossible, to ascertain non-recurring costs such as tooling, set up, or development costs. However, it should be noted that the price history does show a downward trend in unit price in spite of a known rise in the economy.

j. Not applicable.

k. Not applicable.

## PRICE HISTORY OF SELECTED MILITARY ITEM

Contractor, contract, and date (c)	Quantity (d)	Fiscal year scheduled delivery (e)	Total value (f)	Unit price (g)	Savings
Minowitz Manufacturing Co.:					
71-C-1056, July 7, 1970.....	1,098	1971	\$711,504	\$648	\$55,976.04
MOD-P00001, Oct. 5, 1970.....	549	1971	355,752	648	27,988.12
72-C-0747, July 29, 1971.....	384	1972	208,896	544	28,188.00
MOD-P00001, Aug. 8, 1971.....	208	1972	113,152	544	16,848.00
MOD-P00002, Nov. 18, 1971.....	176	1972	95,744	544	14,256.00
72-C-2075, Dec. 9, 1971.....	920	1972	483,000	525	65,320.00
MOD-P00001, Jan. 24, 1972.....	513	1972	269,325	525	36,420.00
73-C-0721, Dec. 20, 1972.....	669	1973	347,211	519	52,815.00
Total savings <sup>1</sup> .....					297,847.16

<sup>1</sup> Total cost savings incurred that are directly attributable to the competitive offerors received on this generator. This figure was computed by multiplying the difference in competitive prices received on the solicitation by the number of units procured.

## Price History of Selected Military Equipment

1. *Reason for Selection.*—An adequate technical data package was furnished for competitive procurement.

2. *Description.*—XM822 Semitrailer Petroleum Laboratory van, 10 Ton, 4 Wheel.

3. *Buying Activity.*—US Army Tank-Automotive Command, Procurement & Production Directorate, Systems Procurement Division, Trailer Section (AMSTA-IMEET), Warren, Michigan 48090.

4. *History of Development and Acquisition of Re-Procurement Data Package—*

Because of the gradual two decades attrition of existing semitrailer-mounted petroleum laboratories in the field, higher headquarters approved the development of a new semitrailer laboratory in late 1965. One of the prime requisites was the requirement for equipment of latest state-of-art design.

Preliminary planning and investigations were initiated in February 1966 for a "semitrailer" of the 10-ton category for Natick Laboratories, Mass., initiator of the project. After the project was transferred to USAMERDC, Ft Belvoir, VA, TACOM's task was extended to designing and fabricating a "complete new semitrailer-mounted petroleum laboratory" for conducting tests of petroleum products under field conditions. Products were to be tested for compliance with the respective standards of the American Society for Testing and Materials (ASTM) and Federal Test Method Standard No. 791 (FTMS), as for example determination of flashpoint, saponification number, water content, pour point, copper corrosion by petroleum products, dilution of gasoline, vapor pressure of petroleum products, standard viscosity, gum in fuels kinematic and dynamic viscosity, ash, oxidation stability of gasoline, lead in gasoline, dropping point, aniline point, foaming characteristics of lubricating oils, neutralization number, temperature, water reaction, refractive index, density, specific gravity, water and sediment in fuel oils, freezing point, color of dyed aviation gasolines, cloud point knock characteristics, neutrality, resistance of greases to aqueous solution, etc.

The new laboratory was to be completely self-sustained, requiring only external electrical power for operating the instruments; apparatus, ovens, air conditioner, heater, lighting, a water supply and a waste water disposal facility when in operation.

In addition to the hardware, software was required of the following: complete documentation for competitive procurement of additional labs, technical manuals for operation and repair parts support, calibration procedures for various on-board equipment, and the necessary military specifications describing the functional aspects of the complete laboratory.

Engineering for the required item was initiated by TACOM 23 Aug 67 and a contract awarded for fabrication 30 Jan 68. The prototype was delivered to the Army, July 1971.

The total vehicle housing the lab and other equipment is designated as Laboratory, Petroleum, Semitrailer Mounted; the semitrailer portion of the total vehicle is designated as Semitrailer, Van; Petroleum Laboratory, 10 Ton, 4 Wheel, XM822, compartment, in the forward areas of the trailer, contains the air conditioner, plenum, heaters, compressed air and vacuum system and pressure water supply; one personnel entrance door in the curbside wall and one door in the front wall are provided for servicing the air conditioner. The central portion, or laboratory compartment, has two stainless steel covered counter and cabinet areas along the side walls for operation and storage. In the front section are a refrigerator, fume hood and gum bath mounted on a storage cabinet separating the lab compartment from the utility compartment. Access to the lab compartment is provided by a door in the curbside wall and in a partition separating the laboratory compartment from the rear compartment. The rear compartment houses a knock, engine, gas cylinders and a blending kit; an access door to this compartment is provided in the rear trailer wall.

Purging and other safety devices are installed in the laboratory to meet applicable requirements; a tool box and other storage boxes are mounted to the undercarriage of the vehicle. The emergency and external service lights are operated by 24V DC current supplied by the prime mover, the M52 Truck/Tractor, 3-phase, 60ZP, 120/208 V AC electric power, furnished by an external generator, is used for operating the electric lab equipment, lights (120V) and the air conditioner (208V), approximately 60KW are required for operating the above components. Glassware and other items are stored in applicable containers.

Total costs for the engineering and fabrication of the prototype laboratory are shown below:

Contractor: (PEMA Funding)

Engineering and Documentation: \$209,000

Although the XM822 was designed for the US Army, other DOD services such as the Navy, and allied foreign countries have expressed interest in procuring these units for their own use.

#### 5. Production Procurement History

a. *Sole Source Contractor—Miller Trailers, Inc., Bradenton, Florida*

- (i) Type of contracts—firm fixed price, sole source.
- (ii) Contract number and date—DAAB07-68-C-1104, 30 June 1968.
- (iii) Quantity—one (1) unit.
- (iv) Delivery schedule by fiscal year—FY 72.
- (v) Total contract value—\$75,486.00.
- (vi) Unit price of end items—\$74,486.00.
- (vii) Description and value of items or services other than end items on each contract—NA
- (viii) Non-recurring cost included in end item unit price—such as development or tooling—\$209,000.00, engineering and documentation.

(ix) Subsequent claims or termination charges—NA

(x) Service comments—No contract was completed on schedule and was considered to be a quality product.

b. *Competition Contractor—Southwest Truck Body, Co., 200 Sidney Street, St. Louis, MO*

- (i) Type of contracts—firm fixed price, advertised.
- (ii) Contract number and date—DAAE07-74-C-0021, 9 Oct 1973.
- (iii) Quantity—three (3) units.
- (iv) Delivery schedule by fiscal year—FY 74.
- (v) Total contract value—\$134,804.97 per contract.
- (vi) Unit price of end items—\$44,934.99 per contract.
- (vii) Description and value of items or services other than end items on each contract—

- (viii) Non-recurring cost included in end item unit price—such as development or tooling—NA  
 (ix) Subsequent claims or termination charges—NA  
 (x) Service Comments—

CONTRACT DATA ON PROCUREMENT HISTORY OF AN/SPS-55

A. Reason for Selection: This is an example of an item which has gone from sole source to competitive procurement.

B. Description of System and its end use AN/SPS-55 Radar: High power, high resolution surface radars designed for general surface search operation aboard combatant ships. This unit is used in DE, DD Class Ships and all larger surface combat ships.

C. Buying Activity: Naval Ship Systems Command.

D. History of Development: (a) After a competitive negotiation, Raytheon, based on their technical excellence, was awarded a CPIF Contract for the development of two AN/SPS-55 XNI models under Contract Nobsr 91245 dated 6/12/64. Service approval was obtained 21 May 1968.

(b) The AN/SPS-55 is the successor radar for AN/SPS-10. A recent Contract for 12 AN/SPS-10 radars was awarded in November 1970 @ \$44,900 each. Budgetary quotes from Raytheon in the spring of 1970 for a quantity of 36 AN/SPS-55's indicated a unit price of \$169,000. The Navy considered the price to be out of line.

(c) After many deliberations, it was decided that a (2) two-step multi-year procurement would be appropriate to satisfy the requirements of the DD 963 and DLGN 38 Class shipbuilders for a quantity of 36 units. Accordingly, a performance specification was developed by NAVSEC and on 5 November 1970, a Request for Unpriced Technical Proposals was mailed to 40 prospective bidders. The solicitation provided for reviewing of an AN/SPS-55 XNI, built by Raytheon, by prospective offerers at NAVSEC, Norfolk.

Technical proposals were received from 12 companies, 10 of which were determined to be acceptable. Step 2 was mailed in March 1971 and resulted in award to the lowest responsive and responsible bidder, Cardion Electronics, a Division of General Signal Corporation.

The unit price awarded to Cardion of \$41,800 compares to Navy estimates expecting a unit price of over \$100,000 and Raytheon's estimate of \$169,000.

E. Acquisition of re-procurement data package: Under Contract 71-C-1332, Item A001EM Category E drawings according to MIL D-1000 NAVMAT were procured.

F. Production Procurement History:

	Sole source procurement fiscal year 1968	Competitive procurement fiscal year 1974
(a) Contractor	Raytheon Corp	Cardion Electronics.
(b) Type of contract	CPIF (competitive RFP)	FFP (competitive RFP).
(c) Contract number	Nobsr 91245	71-C-1332.
(d) Date	May 1964	May 1971.
(e) Total	2 developmental models	36.
(f) Delivery schedule:		
(1) Fiscal years 1970 and 1971	Not available	12.
(2) Fiscal year 1972	do.	8.
(3) Fiscal year 1973	do.	8.
(4) Fiscal year 1974	do.	8.
(g) Total contract value	\$1,139,400	\$1,745,650.
(h) Unit price	\$569,700	\$41,800.
(i) Repairs and spares	\$27,000	Not available.
(j) Nonrecurring costs	Data to determine nonrecurring costs is not available since these contracts were competitively awarded.	
(k) Claims, etc	None.	
(l) Service comments	Equipments have not yet been installed in the fleet and all testing requirements have not yet been completed, so information concerning service usage is not available. Equipment has passed all tests conducted to date which include factory acceptance tests and service approval tests.	

1. Reason for Selection: Other Competitive.

2. Description of System or Sub-system and End Use: The AN/UPX-23 (now AN/UPX-27) interrogator is part of the AIMS system. It is used in conjunction with radar for sophisticated identification of aircraft beyond the visible range both on ship and ashore.

3. Buying Activity: Naval Electronic Systems Command, N00039.

4. History of Development: The AIMS system is a tri-service project to conform with the revised National Standards and National Airways Utilization Plan. The AN/UPX-23 was developed under a fixed price two-step procurement by Zenith Radio Corporation Contract N00039 67-C-1452. This was also the first production contract.

5. Acquisition of Re-Procurement Data Package: Engineering drawings were procured under the first production contract but not separately priced. The drawings were unnecessary for the subsequent sole source procurement and not available in time and would have been of little use in the follow-on two-step competitive procurement due to design changes in the performance specification which also changed the designator to AN/UPX-27.

6. Production Procurement History: There are two contractors involved, Zenith Radio and Cardion Electronics who was awarded the most recent contract. Two (2) of the contracts were competitive and one sole source negotiated. All were fixed price.

Contract No. ....	67-C-1452 dated May 1967	*	67-C-0171 dated May 1972.
Type .....	Competitive	Sole source neg.	Competitive.
Amount .....	\$2,100,000	\$465,000	\$2,500,144.
Quantity .....	405	60	625.
Unit price .....	\$5,000.	\$7,750	\$3,460 per contract.
Delivery .....	Fiscal year 1969 (130); fiscal year 1970 (265).	Fiscal year 1973 (60)	Fiscal year 1975 (355); fiscal year 1976 (230).
Comments .....	Delivery 16 mo late.	Equip. perform. marginal	Delivery not yet due.
Claims .....	None		None.

\* The original quantity planned for this procurement was 105 units. Negotiations were extremely difficult and Zenith was phasing out their Government operations at that time. The final outcome was a 60-unit add-on to the 1452 contract and Zenith would not build further units. These 60 units were essentially complete at the time of negotiations and Zenith would not or would not rework them to completely meet the specifications and were accepted by the Government with certain specification changes. Although some engineering design and 1st article build costs are included in the end item cost, these nonrecurring costs were not separately priced.

1. Reason for Selection: Other Competitive.

2. Description of System: Equipment is AN/URT-23(V), a 2-30 transmitter with 1 KW output used on ship and ashore.

3. Buying Activity: Naval Electronic Systems Command, N00039.

4. History of Development: As a result of competitive procurement (by Naval Ship Systems Command), R. F. Communications was awarded Contract NOBSR 89069 dated in January 1963. This was a fixed price contract in the amount of \$527,000 to design, develop, fabricate and furnish eight (8) test models.

5. Acquisition of Re-Procurement Data Package: Engineering drawings were procured under the first production contract but the drawings were not separately priced. The drawings were of limited usefulness due to subsequent design changes and there were no data rights problems.

6. Production Procurement History: Only one contractor, R. F. Communications, Inc., is involved and three production contracts were awarded, all fixed price.

	NOBSR 93367	68-C-1584	72-C-0296
Award date .....	June 1965	June 1968	June 1972.
Contract type .....	2 step	Sole source	2 step.
Quantity .....	1,095	402	348.
Unit price .....	\$3,236	\$4,362	\$4,325 per contract.
Total price .....	\$7,859,135	\$2,128,256	\$1,835,850.
Delivery schedule .....	Fiscal year 1967 (242) Fiscal year 1968 (420) Fiscal year 1969 (433)	Fiscal year 1970 (272) Fiscal year 1971 (130)	Fiscal year 1974 (75). Fiscal year (229).
Claims or termination charges .....	None	None	None.
Comments .....	Performance good	Performance good	Performance good.
Eng. service .....	\$53,434	\$11,100	\$13,260.

Each contract included substantial quantities of separate power supplies and remote control boxes which account for most of the difference between the extended unit price and the contract price.

There were no non-recurring costs specifically set forth in any of the contracts; although each contract had a not-separately-priced requirement for provisioning and technical data including reproducible copy of a Technical Manual.

It must be noted that there were specification changes between the three contracts for improved performance. These changes increased the direct costs to the contractor (in one case approximately \$60 per unit) so that the result of competition for the current contract is a reduction in price substantially larger than the 1% price reduction shown between the last two contracts.

1. *Reason for Selection:* This is an equipment that was switched from non-competitive to competitive type of procurement at the time of the VIETNAM phase down.

2. *AN/TRC-97:* The AN/TRC-97 is a Transhorizon Tropospheric Scatter Microwave Radio Transceiver which provides a complete communications facility for multichannel voice, teletype or data traffic with high reliability and performance. Its dish type antennas and an engine-generator may be packaged in a Government-furnished single axle trailer and the balance of the system is packaged in an S-308 shelter which in turn may be mounted upon a Government-furnished (M-37) 1½ ton truck. The equipment is transportable by truck and fixed and rotary-wing aircraft. The power supply and transportation equipment is by specification excluded from the AN/TRC-97 and their costs are not included in this brief.

The equipment is used overseas and in the CONUS on maneuvers. It is also used in rather static situations in lieu of leasing common carrier lines. In the line of sight mode satisfactory communications can often be conducted at 80 miles distance between the two points. In the tropospheric mode communications at a distance of 115 miles are usually satisfactory. There are 5 configurations of the AN/TRC-97; the basic equipment which has 12 channels and the other configurations have 24 channels.

The equipment is a point to point directional system.

The Navy purchases equipment of this type for the U.S. Marine Corps and in the case of equipment which it purchases for the USMC for the U.S. Army and USAF if requested.

3. *Procurement Activity:* Naval Ship Systems Command and Bureau of Ships, Dept. of Navy #N00024 from FY 62 through FY 67.

Naval Electronic Systems Command, #N00039 after FY 67.

4. *History of Development:* The AN/TAC-97 is a militarized equipment but it serves a common civilian type communication need. Various firms were considered capable and the technology for the AN/TRC-97 was considered well in hand in FY 62. As a result, a two-step IFB was issued for a quantity of 84 of these equipments. The award was made to RCA Corporation. This was a fixed price award based upon bids and the Government had no rights and sought no data concerning development costs. However, in 1970, the Government made an engineering estimate that engineering, fabrication, testing and rehabilitation of the preproduction models cost \$500,000 and that any new vendor seeking to do a similar job at that time would experience a cost of about \$250,000. The lower cost is on the assumption that a new vendor would copy some of the RCA work.

5. *Acquisition of Re-Procurement Data Package.*—A competitive data package was obtained with the first production. It was not used until 1970 at which time Government engineers would certify that it was only adequate for a two-step IFB effort.

It is assumed that the cost of the data was included in the cost of the contract.

This contract is filed in the NAVSHIPS section of the retired Navy files at Suitland, Md.

6. *Production Procurement History.*—a. At a glance:

June 1963 84 12 Channel AN/TRC-97's at \$67,000 Competitive.

June 1965 116 24 Channel AN/TRC-97's at \$116,907 Non-Competitive; 96 24 Channel AN/TRC-97's at \$109,513 Non-Competitive.

June 1967 70 24 Channel AN/TRC-97's at \$109,530 Non-Competitive; 38 24 Channel AN/TRC-97's at \$136,360 Non-Competitive.

Oct. 1970 26 24 Channel AN/TRC-97's at \$119,220 (AVG) Competitive.

b. In detail:

1.—CONTRACTOR: ENERGY SYSTEMS, INC., PALO ALTO, CALIF.; CONTRACT TYPE: FIRM FIXED PRICE; CONTRACT NO.: N00039-71-C-0314, OCTOBER 1970

1 preprod model and preprod testing of AN/TRC-97A.....	\$403,000	\$403,000
26 AN/TRC-97.....	103,845	2,699,970
26 MK-956/TRC-97 test kits.....	560	14,560
3 lots of data.....		23,000
Total contract price.....		3,140,530

Delivery: Fiscal year 1973. Delivery is in process and will be completed in fiscal year 1974.

II.—CONTRACTOR: RCA CORP., CAMDEN, N.J.; CONTRACT TYPE: FIRM FIXED PRICE—A LETTER CONTRACT CONVERTED TO FIRM FIXED PRICE; CONTRACT NO.: N00024-67-C-1498, JUNE 1967

38 AN/TRC-97A.....	\$136,360	\$5,181,680
4 AN/TRM-15*.....	8,333	33,332
4 AN/TRM-16*.....	7,312	29,248
4 AN/TRM-16*.....	12,616	50,464
4 AN/GCM-3*.....	15,711	62,844
Total.....		6,360,000

\*Test sets.

Delivery: Fiscal year 1969. Delivery completed.

III.—CONTRACTOR: RCA CORP., CAMDEN, N.J.; CONTRACT TYPE: FIRM FIXED PRICE—LETTER CONTRACT, CONVERTED TO FIRM FIXED PRICE; CONTRACT NO.: N00039-67-C-1455, JUNE 1967

70 AN/TRC-97A.....	\$109,530	\$7,667,100
70 MK-956/TRC-97.....	470	32,900
Total.....		7,700,000

Delivery: Fiscal year 1968/1969. Delivery completed.

IV.—CONTRACTOR: RCA CORP., CAMDEN, N.J.; CONTRACT TYPE: FIRM FIXED PRICE—LETTER CONTRACT CONVERTED TO FIRM FIXED PRICE; CONTRACT NO.: NOBSR 93356, JUNE 1965

116 AN/TRC-97A.....	\$116,907.50	\$13,561,270
47 AN/.....Antennas.....	6,050.00	284,390
96 AN/TRC-97A.....	109,513.00	10,513,245
Total.....		24,358,864

Delivery: Fiscal year 1967. Delivery has been completed. Data abstracted from contract clearance files—contract files not available.

V.—CONTRACTOR: RCA CORP., CAMDEN, N.J.; CONTRACT TYPE: FIRM FIXED PRICE—2-STEP IFB COMPETITION; CONTRACT NO.: NOBSR 89545, JUNE 1963

84 AN/TRC-97, 12 Channel.....	\$74,000	\$6,126,000
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Delivery: Fiscal year 1966. Delivery completed about 1 yr. late. Data abstracted from contract clearance files—contract files not available.

### MK 45 COMPETITIVE BUY PROCUREMENT HISTORY

- Reason for Selection: (Competitive).
- Description of System and the End Use: MK 45 MOD 0 5''/54 Light Weight Naval Gun to be installed as main gun battery on the DD 963, DLGN-36, DLGN-38, and LHA-1 Class Ships. It is a fully Automatic, Lightweight, Shielded, Single-Barrel Weapon capable of firing 5''/54 ammunition at a rate of 17-20 rounds per minute. It can engage MACH 3 air threats; small, fast highly maneuverable surface targets and can provide extremely accurate gun fire support to ground forces. It is interfaced with the MK 6 Lower Ammunition Hoist and is controlled by the MK 86 Gun Fire Control System. This procurement carries a DMS Reg 1 rating of DO-A5.
- Buy Activity: Naval Ordnance Systems Command (N00017).
- History of Development:  
In order to meet the requirements established by SOR 12-04 for a new gun system of advanced design, a development contract Now 64-0234 for \$5,966,510 was issued to Northern Ordnance Division of Food Machinery Corporation in

1964. The primary design objectives were to reduce the required number of operating personnel, reduce gun mount weight and increase reliability and maintainability. A prototype under the above contract was delivered to NWL, Dahlgren, for test and evaluation in 1967 and later installed aboard the AVM-1 for technical and operational evaluation. After successful completion of these tests and evaluation the MK 45 MOD O was accepted for service use by CNO in July 1970.

The MK 45 prototype met all SOR reliability requirements. However, recent reliability problems experienced in other Naval Guns dictated that additional testing be performed in order to insure that the MK 45 will provide maximum reliability when introduced into the fleet. A production mount, which was aboard the AVM-1 in support of the MK 86 GFC System OPEVAL, was used to perform a 2586 round firing test during the period 10 thru 31 October 1972. The results yielded a mean rounds between failures, of 862 rounds verses 350 mean cycles between failures required by the SOR.

5. Acquisition of Re-Procurement Data Package: Through early planning a data package suitable for competition was procured under Contract N00017-68-C-4211 with FMC. It was possible to utilize this data package to the Government's advantage because the requirements for the gun mounts were established well in advance so as to utilize competitive procurement techniques and still meet required shipbuilding schedules. The data package was not separately priced, but was included in the first production contract price. The data package, after a productibility review by the Naval Ordnance Station, Louisville, Kentucky, at a cost of approximately \$365,000, was used to compete Contract N00017-72-C-4206 which was won by General Electric Corporation. The lower unit price is due to greater quantity purchased over an extended period of time for which the competing contractor and their respective subcontractors could plan their production.

#### FIRST PRODUCTION BUY

##### 6. Production Procurement History:

- a. Contractor, Food Machinery Corp/Northern Ordnance Div. (Sole Source).
- b. Contract Type, Cost Plus Incentive Fee.
- c. Contract Number, N00017-68-C-4211.
- d. Contract Date, 13 September 1968.
- e. Quantity of End Item, 25 Gun Mounts—2 Ammunition Hoists.
- f. Delivery Schedule, FY 71—5; FY 72—9; FY 73—11 Gun Mounts; FY 71—2 Ammunition Hoists.
- g. Total Contract Value \$45,947,068 "per contract".
- h. Unit price of end item, Not Separately Priced.
- i. Items other than end items:
  - (1) Special Tooling, Special Test Equipment and other manufacturing aids for Gun Mount.
  - (2) Design, develop, manufacture and test Ammunition Hoist for DLGN-36 and pre-production weapons specifications.
  - (3) Special tooling and test equipment for Ammunition Hoist.
  - (4) Spare parts for Mounts and Hoist installation and check out.
  - (5) Special support equipment for Mount and Hoist.
  - (6) Contractor Training.
  - (7) Training parts.
  - (8) Engineering Drawings and associated data. To allow for competition.
  - (9) Provisioning technical documentation and services for Mounts and Hoist.
- j. Non-recurring Cost included in end item unit price, see above.
- k. Subsequent Claims or Termination Charges, none.
1. Service Comments, contractor's performance has been satisfactory with regard to delivery and has produced a Naval Gun of the highest quality. Because of funding and program requirements, the 25 Guns and 2 Hoists under this contract were purchased on the time table as indicated below:

Date	Mount	Hoist
Sept. 13, 1968	3	
Nov. 1, 1968	2	2
Oct. 1, 1969	5	
Jan. 14, 1970	6	
Dec. 4, 1970	6	
May 21, 1971	3	

This contract was a first production buy from the contractor responsible for developing the Gun Mount and Hoist. This cost type contract was based on total cost only, and therefore, individual line item cost data is not available.

## INTERIM PRODUCTION BUY

1. Contractor: Food Machinery Corporation/Northern Ordnance Division (Sole Source).
2. Contract Type: Fixed Price Incentive.
3. Contract Number: N00017-71-C-4218.
4. Contract Date: 15 Feb 1972.
5. Quantity of End Item: 7 Gun Mounts.
6. Delivery Schedule: FY 74-7 Mounts.
7. Total contract value: \$9,849,525.
8. Unit price of End Item \$1,407,075 "per contract."
9. Items other than End Items: Data in accordance with DD Form 1423, \$145,475.
10. Non-recurring cost in End Item Unit Price: None.
11. Subsequent claims or termination charges: None.
12. Service comments: Contractor is performing satisfactory. Since delivery from another source would require at least 3 years, and delivery of these units were required prior to this time to meet delivery requirements for ship building schedules, it was necessary subsequent to the award of the multi-year contract N00017-72-C-4206, to award this contract to the current producer FMC/NOD, in order to meet these schedules.

## SECOND PRODUCTION BUY

1. Contractor: General Electric—(Competitive).
2. Contract Type: Firm Fixed Price—Two Step, formally advertised, Multi-Year procurement.
3. Contract Number: N00017-72-C-4206.
4. Contract Date: 25 August 1971.
5. Quantity of End Item: 54 Gun Mounts.
6. Delivery Schedule: FY 75-12; FY 76-20; FY 77-22.
7. Total Contract Value: \$46,008,000 "per contract".
8. Unit price of End Item: \$852,000, 166,786 GFM from Contract, Total: \$1,018,786, N00017-72-4213.
9. Items other than End Items: None.
10. Non-recurring cost in End Items: None.
11. Subsequent claims or termination charges: None.
12. Service comments: Contractor is proceeding on schedule and those components produced to date have passed tests satisfactorily. The GFM under Contract N00017-72-C-4213 are sole source items to Food Machinery Corporation/Northern Ordnance Division, such as power driver and fuze setters on which they hold data rights.

## THIRD PRODUCTION BUY

1. Contractor: General Electric—(Competitive Negotiated).
2. Contract Type: Firm Fixed Price.
3. Contract Number: N00017-73-C-4343.
4. Contract Date: 7 March 1973.
5. Quantity of End Item: 2 Mounts.
6. Delivery Schedule: FY 75-2.
7. Total Contract Value: \$1,942,760 "per contract."
8. Unit Price of End Item: \$971,380, \$166,786 GFM from Contract, Total: \$1,138,166, N00017-72-C-4213.
9. Items other than End Items: None.
10. Non-recurring Cost in End Item: None.
11. Subsequent Claims or Termination Charges: None.
12. Service Comments: Gun Mounts required for DLGN-40 Ship was approved after initial competitive buy.

## GOVERNMENT FURNISHED MATERIAL BUY

1. Contractor: Food Machinery Corporation/Northern Ordnance Division (Sole Sources).

2. Contract Type: Firm Fixed Price.
3. Contract Number: N00017-72-C-4213.
4. Contract Date: 15 March 1972.
5. Quantity of End Item: 28 Sets of GFM to Contracts: N00017-72-C-4206, N00017-73-C-4343.
6. Delivery Schedule: Various components of Sets from FY 73—FY 76 to meet GFM requirements under General Electric contracts.
7. Total Contract Value: \$4,676,168 "per contract."
8. Unit Price of End Item: \$166,786.
9. Items other than End Items: None.
10. Non-recurring Cost in End Item: None.
11. Subsequent Claims or Termination Charges: None.
12. Service Comments: a. Set composed of—1 Train Power Drive MK 70 MOD O, Elevation Power Drive MK 69 MOD O, 16 Solenoid operated Valves, 91 Proximity Switches, 1 Fuze Setter MK 30 MOD O.
- b. These items are priority to FMC/NOD having been developed out of IR&D funds.

A. Category: 1.

B. Description: Aircraft Parachute Flare LUU-2.

The LUU-2 is a five inch diameter flare that provides two million candlepower for five minutes. The flare is dispensed from standard five inch flare launchers and dispensers as well as manually. Presetting of delay provides free-fall before ignition of 500-10,500 feet. Suspension is by a 19-foot diameter parachute.

C. Buying Activity: ADTC/SDWP

D. History of Development:

Initial procurement of the LUU-2 Flare was the result of an unsolicited proposal from Thiokol Chemical Corp. The procurement was by letter contract 68 June 29. Procurement of this flare provided for design modification required to make compatible with existing USAF flare dispensers. 3,010 pilots units were procured on 68-C-1387.

The FY71 procurement was for 100,000 units. Method was by letter contract sole source to Thiokol Chemical Corp. Contract 71-C-0049. Unit cost was \$91.45.

The FY72 requirement was competed to selected sources. This requirement was also awarded to Thiokol Chemical Corp. as the low bidder. 186,000 units were procured at a cost of \$59.52 ea on Contract 72-C-0145. A savings of approximately \$32.00 ea.

The FY73 requirement was competed to selected sources and resulted in award to Thiokol Chemical Corp. as the low bidder on Contract 74-C-0015—award for 191,325 units at \$63.83. The slight increase in price was due to improvements in construction and increased material costs.

E. Acquisition of Data Package:

Re-production data was procured on the initial contract (68-C-1387). Delivery was made in April 71 and was first used to compete the FY72 requirements.

F. (1) Contractor: Thiokol Chemical Corp.

(2) Type of Contracts: 68-C-1387 CPIF; 71-C-0049 FPIF; 72-C-0145 FFP; and 74-C-0015 FFP.

(3) Contract Numbers and Dates: 68-C-1387, unknown (retired); 71-C-0049, 22 Oct 70; 72-C-0145, 8 Mar 72; and 74-C-0015, 27 Aug 73.

(4) Quantity of end items on each contract: 68-C-1387-3,010; 71-C-0049—100,000; 72-C-0145—186,000; and 74-C-015—191,325.

(5) Delivery Schedules: Deliveries of production quantities began in March 1971 and are continuing to the present time. The average rate per month was/is 10,000 each.

(6) Total Contract Value: 68-C-1387; 71-C-0049, 9,145,000; 72-C-0145, 10,952,000; 74-C-0015, 12,213,428.

(7) Unit Price of end item: Original—91.45; final—63.83.

NOTE.—On contract 72-C-0145 cost was \$59.52 per unit.

(8) Description and Value: AGE, Training, Engineering Support. N/A. Cost included in end item.

(9) Non-Recurring Cost. (Development and Tooling). None

(10) Subsequent claims or termination: None.

(11) Contractor's performance has been satisfactory on all contracts.

PROCUREMENT OF PROGRAMED DEPOT MAINTENANCE

1. Reason for Selection.—This program was removed from a non-competitive status to a competitive status.

2. *Description of System or Sub-System as its end use.*—Services and supplies necessary for the overhaul of the J85 jet engine and related components. This engine is mainly used by the Air Training Command for the T-38A advanced trainer aircraft.

3. *Buying Activity.*—SAAMA/PPWSS, Kelly AFB, Texas 78241. (FD2050).

4. *History of Development.*—This engine was developed for the Air Force by the General Electric Company. The precise production contract numbers, types and amounts are unknown.

5. *Acquisition of Re-Procurement Data Package.*—Reprocurement data does not apply to this overhaul program. The Work Specifications used by the contractor in performance of this overhaul program are developed by the Air Force and are continually updated as changes occur to the Technical Orders.

6. *Production Procurement History.*—Prior contracts for these services were with General Electric Company, and the work was accomplished at their overhaul facility at Strothers, Arkansas City, Kansas. There were several one-year indefinite delivery type contracts written. For the purpose of this report, only the last contract with General Electric will be cited for comparison purposes with the current competitive contract awarded to Teledyne Neosho under "Source Selection Procedures."

a. *Contractors*

*Noncompetitive.*—General Electric Company, Aviation Services Operation/Strothers, Arkansas City, Kansas.

*Competitive.*—Teledyne Neosho, P.O. Box 648, Neosho, Missouri.

b. *Types of Contracts*

*Noncompetitive.*—One year, fixed price—indefinite quantity.

*Competitive.*—Three-year multi-year fixed price—requirements—with option for two additional one-year periods under AFLC five-year Policy.

c. *Contract Numbers and Dates of Contract*

*Noncompetitive.*—F41608-72-D-0988—7 Jan. 72.

*Competitive.*—F41608-73-D-1242—16 Jan. 73.

d. *Quantity of End Items on Each Contract*

*Contract F41608-72-0988.*—BEQ<sup>1</sup> 653 Engines. 90 Line Items of Components with various BEQs.

*F41608-73-D-1242.*—BEQ—1st Year—213 Engines; BEQ—2nd Year—490 Engines; and BEQ—3rd Year—496 Engines. 88 Line Items of Components with various BEQs.

e. *Delivery Schedule by Fiscal Year*

Both contracts F41608-72-D-0988 with General Electric and F41608-73-D-1242 with Teledyne Neosho are indefinite delivery type contracts. The delivery under these contracts are based on a thirty-day turn-around schedule or delivery is required thirty days after receipt of the repairable engine or component at the contractor's overhaul facility.

f. *Total Contract Value*

*F41608-72-D-0988.*—\$8,737,620.23.

*F41608-72-D-1242.*—\$12,777,075.57.

g. *Unit Price of Items*

See Attachment No. 1 for comparison of prices paid to General Electric Company under the one-year non-competitive contract F41608-72-0988 and Teledyne Neosho's contract F41608-73-D-1242 awarded under competitive conditions.

h. *Description and Value of Items or Services other than End Items on each Contract*

Work requirements over and above that specified in the Appendix "A" Work Specifications: *F41608-72-A-0988.*—\$459,220.00. *F41608-73-D-1242.*—\$600,800.00.

Reimbursable materials—contractor acquired parts. *F41608-72-A-0988.*—\$499,409.00. *F41608-73-D-1242.*—\$1,297,833.48.

i. *Non-Recurring Costs included in End Item Unit Price—Such as Development or Tooling*

There is no non-recurring costs included in the unit prices for any of the items on either contract. These type charges were withdrawn by Teledyne Neosho dur-

<sup>1</sup> BEQ—Best Estimate Quantity.

ing their final offer to the Government under the competitive award. General Electric Co. had previously amortized their non-recurring costs at time of acquisition of the tooling to accomplish the overhaul under prior contracts.

*j. Subsequent Claims or Termination Charges*

F41608-72-D-0988.—None.

F41608-73-D-1242.—None.

*k. Service Comments*

(1) 41608-72-D-0988.—General Electric Co.

This contractor has produced a quality product satisfactorily for many years.

(2) F41608-73-D-1242—Teledyne Neosho.

The contractor was awarded to this firm on 16 Jan. 1973. First engine and component delivery scheduled for Aug. 1973 with four engines and building up to full production of sixty-eight engines by Feb. 1974. The contractor is producing engines on schedule. There are no known deficiencies at this time which will impair his ability to perform satisfactorily under the contract.

ATTACHMENT 1

COMPARISON OF PRICE, SELECTED HIGH VALUE ITEMS

Unit prices—Selected high value items	F41608-72-D-0988	F41608-73-D-1242
J85-4 engines	\$6,008.00	\$4,474.60
J85-5 engine with afterburner	7,902.84	6,090.78
J85-5	6,939.12	5,420.20
J85-7	5,559.11	5,408.64
J85-13	6,546.51	5,367.29
J85-17	5,722.12	4,484.31
J85-17A	5,679.12	4,422.66
Direct labor hourly rate	10.25	12.00
Rotor, assembly compressor (A005)	1,056.42	681.46
Rotor, compressor (A008)	978.19	636.27
Casing, diffuser, afterburner (A013)	317.87	127.73
Nozzle, turbine, Stg 2 (A017)	204.08	65.21
Nozzle, turbine, Stg 1 (A020)	250.60	142.94
Casing, front frame (A025)	420.55	259.87
Pump, lube (A034)	151.09	74.65
Control unit, A/B (A042)	253.06	135.22
Nozzle assembly (A048)	17.62	10.42
Amplifier (A053)	188.42	104.72
Main fuel control (A057)	385.11	205.89

J85 OVERHAUL—ADDITIONAL PRICING INFORMATION

SOLE SOURCE—GENERAL ELECTRIC

Item	Contract F41608-71-D-0144	Contract F41608-69-D-3250
J85-5 W/A	8,231.16	7,313.24
J85-17	6,283.59	5,520.48

PRICE HISTORY OF SELECTED MILITARY EQUIPMENT

1. *Reason for Selection.*—Program that moved from sole source to competitive procurement.

2. *Description of System or Sub-system and its end use.*—Group "A" suspension hardware for Class V Modification 2147, Multi-station ECM for F-4 series aircraft.

3. *Buying activity.*—AFLC/OOAMA (PPWFM).

4. *History of Development.*—Development was result of prime contractor submitted ECP. Hardware development effort was contracted for by a sole source unpriced order to McDonnell Douglas Corp. issued 19 December 1968 (F34601-68-A-2919-QPDR). Unpriced order was definitized into a fixed price contract in the amount of \$2,947,000. This amount was for engineering design and development to accomplish a prototype/trial installation, flight testing and included engineering data that was to be later used for competitive procurement.

5. *Acquisition of Reprourement Data Package.*—Data acquired was Class II engineering drawings. There were no data rights problems and data was

used successfully for reprocurement. It did require some supplemental work by OOAMA Engineering. The cost of data was commingled with development engineering costs and was not accurately determined. It is believed that cost of data was less than \$500,000.

6. *Production Procurement History*.—a. Contractors :

- (1) Sole Source Contractor—McDonnell Douglas Corp., St. Louis, Mo.
- (2) Competitive Contractor—Murco Inc., Clearfield, Utah.

b. Types of Contracts :

(1) Sole source contracts—unpriced orders definitized by Fixed Price Supplemental Agreements.

(2) Competitive Contracts—Labor surplus set aside. Fixed price.

c. Contract Numbers and Dates of Contracts :

(1) Sole Source Contracts :

(a) F34601-68-A-2919-QPDR (19 December 1968).

(b) F34601-69-A-2245-QPAF (3 November 1969).

(2) Competitive Contract: F42600-71-C-0918 (10 February 1971), Murco Inc.

d. Quantity of End-Items on Each Contract :

(1) F34601-68-A-2919-QPDR—Hardware for four proto/trial installations only.

(2) F34601-69-A-2245-QPAF—Initial requirement was for 679 suspension hardware kits. This was reduced through termination to 190.

(3) F42600-71-C-0918—1423 ea.

e. Delivery Schedule by Fiscal Year :

(1) F34601-68-A-2919-QPDR—All FY 70.

(2) F34601-69-A-2245-QPAF—All FY 71.

(3) F42600-71-C-0918—FY 73—398; FY 74—1025.

f. Total Contract Value :

(1) F34601-68-A-2919-QPDR—\$2,947,000.00.

(2) F34601-69-A-2245-QPAF—\$1,554,841.00.

(3) F42600-71-C-0918—\$2,952,187.95.

g. Unit Price of End Items :

(1) F34601-68-A-2919-QPDR—(NA) Engineering; 4 prototype/trial installation and data—\$2,947,000.

(2) F34601-69-A-2245-QPAF—\$7,700.00.

(3) F42600-71-C-0918—\$2,025.73.

h. Description and Value of Items or Services other than end items on each contract.

(1) F34601-68-A-2919-QPDR—See paragraph 6g(1) above.

(2) F34601-69-A-2245-QPAF—\$91,841.00 for termination charges.

(3) F42600-71-C-0918—Tooling—\$17,490.00.

i. Nonrecurring cost included in end item unit price—such as development or tooling :

(1) F34601-68-A-2919-QPDR—Total effort was considered non-recurring cost.

(2) F34601-69-A-2245-QPAF—none (included in QPDR above).

(3) F42600-71-C-0918—unknown since this procurement was awarded on competitive basis.

j. Subsequent Claims or Termination Charges (describe) :

(1) F34601-68-A-2919-QPDR—none.

(2) F34601-69-A-2245-QPAF—\$91,841.00 (termination charges on 489 units that were subsequently procured competitively on contract F42600-71-C-0918).

(3) F42600-71-C-0918—\$29,350.00 claim for specification changes.

k. Service Comments : It is believed this is an excellent example of savings that can be realized by a transition from sole source procurement to a competitive procurement. Significant dollar savings were realized and product was considered equal or better than that furnished by prime contractor.

HCU-6/E AIRCRAFT CARGO PALLET PROGRAM

1. Reason for Selection : Originally procured on a sole source basis. Subsequently procured competitively with a downward price trend.

2. Description : HCU-6/E Pallet, Cargo, Aircraft. This item is part of the 463L Materials Handling Equipment System used to facilitate the mechanized loading and unloading of aircraft cargo in C-130, C-141, and C-5 aircraft.

3. Buying Activity : Warner Robins Air Materiel Area, Robins AFB, Directorate of Procurement & Production.

4. History of Development: The first requirement for WRAMA to procure pallets was PR WR-6-21140 received in April 66. It was determined to award to Goodyear Aerospace Corp on a select source basis for the following reasons:

a. Pallets procured to a different design configuration produced by Brooks & Perkins Inc. and Brownline Corp. were not withstanding heavy usage treatment. As a consequence there was a shortage of pallets within the 463L System.

b. Some pallets furnished by Goodyear on a production contract written by AFSC/ASD in 1961 were still in use. The extended life of the Goodyear pallets was attributed to a superior bonding process used during fabrication, which was proprietary to Goodyear.

On 20 May 66, Unpriced Order WR 66-4, against BOA 34(601)24938 was issued to Goodyear for 4,495 pallets and data including Handbooks and a Reprocurement Data Package. Due to critical SEA requirements a total of 19,431 pallets were needed to fulfill the operating needs of using commands. Assets numbered 7,294, thereby leaving a shortage of 12,137. Condemnation and operational losses accounted for an additional 601 pallet shortage per month. The acute shortage was considered an emergency and the decision was made to maintain three production bases. Brooks & Perkins Inc., Brownline Corp. and Goodyear Aerospace Corp. were the three producers selected. To preclude continued failure of the Brooks & Perkins and Brownline produced pallets, procurement was accomplished in accordance with an updated specification, MIL-P-27443D and AFLC/AFSC Form 5, "Advance Procurement Supplemental Data Sheet." A Letter Contract, F09603-67-C-1491, for 5,812 pallets was awarded to Brooks & Perkins Inc.

A letter Contract, F09603-67-C-1724, was also awarded to Brownline Corp. for 1,900 pallets. Goodyear was awarded an Unpriced Order, WR-67-2 against BOA, AF34(601)24938 dated 26 Jan 67. Thereafter, awards were made on a competitive basis except where emergencies dictated otherwise.

5. Acquisition of Reprocurement Data Package: The reprocurement data package, 65QS402-300, was procured from Goodyear Aerospace Corp in May 1966 for \$40,257.00 and was first used in Brooks & Perkins Contract F09603-67-C-3833 dated 19 Jun 67 with first delivery in 1968. Previous to this new data package, procurements were made in accordance with specification MIL-P-27443D and AFLC/AFSC Form 5's supplemented by three Value Engineering Change Proposals, and use of a thermocured adhesive for material bonding. Estimates of savings on this follow-on contract were in the amount of \$200,000.00.

6. Production Procurement History: See attachments.

Contractor and type of contract	Contract No.	Date	Quantity	Total value	Unit price cost	Recurring cost	Claims	Service comment
Goodyear Aerospace, unpriced order.	34(601)-24938-WR-66-4 <sup>1</sup>	May 20, 1966.	4, 495	\$2,246,286.35	\$499.73	Unknown	None	1st WRAMA Buy.
Goodyear Aerospace exercise option.	34(601)-24938-WR-66-4 <sup>2</sup>	Sept. 30, 1966.	2,248	1,123,393.04	499.73	do	do	50 percent pution.
Brooks & Perkins, letter contract.	F09603-67-C-1491 <sup>3</sup>	Oct. 21, 1966.	5, 812	1,819,156.00	313.00	do	do	Emergency-decision made to have 3 production bases.
Brooks & Perkins, 2-step.	F09603-67-C-2102 <sup>3</sup>	Dec. 9, 1966.	988	398,411.00	403.25	do	do	do
Brownline Corp. Letter contract.	F09603-67-C-1724 <sup>4</sup>	Dec. 3, 1966.	1, 000	678,960.00	323.00	do	do	2d production base.
Goodyear Aerospace, unpriced order.	AF34(601)24938-WR-67-2 <sup>1</sup>	Jan. 26, 1967.	3, 026	1,486,326.74	494.	do	do	3d production base.
Wickes Industries, letter contract.	F09603-67-C-2982 <sup>4</sup>	Mar. 1, 1967.	1, 000	483,386.00	483.38	do	do	Used to develop additional sources.
Goodyear Aerospace, unpriced order.	F34601-67-1-2189-R101 <sup>1</sup>	Mar. 10, 1967.	8, 800	4,377,780.00	497.475	do	do	Emergency-selected source to Goodyear.
Brooks & Perkins, letter contract.	F09603-67-C-3238 <sup>3</sup>	Mar. 29, 1967.	1, 488	674,064.00	453.00	do	do	do
Brooks & Perkins, FFP.	F09603-67-C-3833 <sup>3</sup>	June 19, 1967.	5, 581	2,532,378.75	453.75	do	do	do
Goodyear Aerospace, priced order.	F34601-67-A-2189-R105 <sup>1</sup>	July 31, 1967.	12, 000	3,244,000.00	437.00	do	do	Awarded due to capacity to produce 2,000 per month (emergency).
Brooks & Perkins, FFP.	F09603-69-C-0212 <sup>3</sup>	Sept. 26, 1967.	3, 358	1,571,544.00	468.00	do	do	do
Goodyear Aerospace, Price order.	F34601-68-A-3143-R102 <sup>2</sup>	Mar. 14, 1968.	6, 289	2,243,286.00	356.70	do	do	Awarded to low.
Brooks & Perkins.	F09603-68-C-2831 <sup>3</sup>	June 31, 1968.	4, 500	1,556,145.00	345.81	do	do	do
Brooks & Perkins, labor set-aside	F09603-68-C-2831 <sup>3</sup>	June 27, 1968.	4, 500	1,556,145.00	345.81	do	do	do
Goodyear Aerospace, Priced order.	F34601-69-A-1044-R104 <sup>3</sup>	June 1969.	4, 930	1,455,582.50	295.25	do	do	do
Do.	F34601-69-A-1044-R104AC <sup>3</sup>	September 1969.	2, 145	633,311.35	295.25	do	do	do
Brooks & Perkins, Priced order.	F09603-69-A-0039-0003 <sup>3</sup>	September 1969.	8, 285	2,066,610.40	249.44	do	do	do
Brooks & Perkins.	F09603-70-C-2027 <sup>3</sup>	Decembar 1970.	8, 290	2,211,357.50	266.75	do	do	do
Do.	F09603-70-C-0900 <sup>3</sup>	February 1971.	3, 000	720,990.00	240.33	do	do	Do.
Brooks & Perkins, labor set-aside.	F09603-72-C-0900-P00001 <sup>3</sup>	do.	3, 000	720,990.00	240.33	do	do	do
Brooks & Perkins.	F09603-72-C-0721 <sup>3</sup>	February 1973.	3, 244	855,118.40	263.60	do	do	Small business set-aside.
Brooks & Perkins, labor set-aside.	F09603-73-C-0721-P00001 <sup>3</sup>	do.	3, 244	855,118.40	263.60	do	do	do

<sup>1</sup> Sole source.<sup>2</sup> Exercise option.<sup>3</sup> Competition.<sup>4</sup> Awarded to develop another source.

A. Category 1.

B. Vertical Reference Gyroscope Indicator, Type ID-1775/A used on F/RF-4 aircraft.

C. ASD/SMKPA.

D. Development of a self-contained standby attitude indicator was attempted by the Air Force and by the Navy some 12 or more years ago. The attempts were unsuccessful. Prior to the Air Force acceptance of the Jet Electronics and Technology, Inc. indicator, a three box two inch remote attitude reference system (Indicator, Displacement Gyroscope and Rate Switching Gyroscope) was in use. The system was not satisfactory as an emergency standby vertical reference system because of excessive power drain and weight. As a result of Navy flight test evaluation they selected the Jet single box self-contained indicator and began usage of it with an initial procurement of 33 indicators in Mar 67 because of an emergency arising from a flight hazard which resulted in fatalities to Navy personnel. The Government did not contribute the development of the Navy indicator, Type ID-1481/A. The initial procurement by the Air Force was in Dec 67 for 128 indicators, Type ID-1601/A by letter contract in support of urgent installation requirements for the AT-37B aircraft program. Unit price was \$2,727.81 and initial contract was \$468,148.86. The follow-on procurement was formally advertised; however, Jet was the only bidder. Total program requirements were small, 476 through Jul 71, and obviously limited competition.

The indicator ID-1755/A being reported here under Category 1 is internally identical to the ID-1601/A. External differences are basically for aircraft installation changes and alterations to provide visual compatibility with the cockpit instrumentation. The requirements was for a quantity of 2259 indicators to support an urgent F/RF-4 aircraft program safety modification retrofit program. In support of F/RF-4 Safety Modification retrofit schedules 1250 of a new type vertical reference gyroscope indicators were procured sole source. Balance of 1009 retrofit requirements were held for a competitive procurement. To assure continuity of production and delivery of a satisfactory indicator at the lowest overall cost to the Government it was determined to utilize Real Cost factors on a two-step IFB requiring approval for inclusion on the Qualified Products List (QPL) prior to time of bid opening of the second. Milestones were established considering inputs from industry as to time required for qualification testing. Dates were established that would provide continuity of delivery either by a 30 Apr 71 award of the IFB or by a 15 Apr 71 exercise of the option under the sole source procurement. Bid price received of \$1,649 per indicator was \$276.58 lower than the available option price of \$1,925.58. FFPV Contract F33657-71-C-0973 was awarded to Jet Electronics & Technology, Inc. on 12 Apr 71 for a quantity of 1106 vertical reference gyroscope indicators in the amount of \$1,823,794. The prior sole source option price of \$1,925.58 less the competitive award price of \$1,649 resulted in a unit price savings of \$276.58 or a total savings of \$305,897.48 for the 1106 indicators. Incidentally, based on the sole source contract unit price which is \$2,033.05, the savings would be \$424,759.30. In addition to the cost savings, the Air Force benefitted by the availability of an option for possible additional quantities at incremental prices which ranged from \$200 to \$250 lower than the sole source contract option prices.

E. The ID-1755/A indicator was procured to performance specification MIL-I-81454 (AS) and Exhibit ASD/ENFI 722-2. Jet reprourement data package was not obtained because (1) competitive procurement was effected concurrent with initial sole source production allowing insufficient time to validate data as adequate for reprourement; (2) significant data cost since the indicator was developed at the contractor's expense; (3) indicator manufactured under France (SFENA) license to Jet which involved the basic design and six patents.

F. (I) Sole Source:

- (1) Jet Electronics & Technology, Inc., Grand Rapids, Mich.
- (2) Firm fixed price (letter contract).
- (3) F33657-71-C-0274, Sep 70.
- (4) 1250 ID-1755/A indicators.
- (5) Nov 70 through Sep 71.
- (6) Original value, \$2,589,072.51; final value, \$2,713,144.53.
- (7) \$2,033.05.
- (8) See below.

	Data	Age	Spare parts
Original value.....	\$23,456.00	\$24,304.01	0
Final value.....	27,168.76	103,742.39	\$89,226.88

- (9) Total \$33,772.27  
 (10) Decrease \$4,545.00 defective cost or pricing data  
 (11) Division Comments (see note page 3)  
 F. (II) Competitive (20 bidders solicited; 2 bidders; 1 responsive bid):  
 (1) Jet Electronics & Technology, Inc.; Grand Rapids, Michigan.  
 (2) Firm fixed price.  
 (3) F33657-71-C-0973, Mar. 71.  
 (4) 1106 ID-1755/A indicators, initial award 345 added by option.  
 (5) Sep 71 through Jul 72.  
 (6) Original value, \$1,832,794; final value, \$2,594,452.  
 (7) Original price—\$1,649 for 1106 each; option—1,837 for 12 each; option—1,798 for 70 each; option—1,798 for 245 each; and option—1,837 for 18 each  
 (8) Not separately priced  
 (9) Not separately priced  
 (10) None  
 (11) Division Comments (see note below)

NOTES.—Jet met or exceeded contractual delivery requirements. The ID-1755/A indicator has proved to be highly reliable. Jet completed the latest contract production reliability check of 1000 hours in Nov 73 without a failure. It is noted that prior to Royalty approval under the award of the sole source contract with Jet, the AFLC/JAPP Attorney went to AFLC/OCAMA and with the Inventory Manager completely verified Jet's proposal covering the patents included in the ID-1755/A.

#### PULSE CODE MODULATION (PCM) COMPONENTS

##### Introduction

a. The AN/TCC-5 and AN/TCC-46 are part of a family of systems composed of tactical pulse code modulation communications components which provide 12, 24, 48 and 96 simultaneous voice channel telephone communication over radio and cable. Pulse code modulation is a process by which spoken words are converted into digital computer language. Each of 12, 24, 48 or 96 telephone conversations are simultaneously processed by this method and the resultant digital signals are then transmitted over radio and cable. At destination, the digital signals are reconverted to voice.

Compared to the frequency division multiplex equipment it replaces, PCM equipment provides more high quality telephone lines at less cost per line, in a package one seventh the size of the former equipment.

The AN/TCC-45 is a 24 channel system. The AN/TCC-46 is a 48 channel system. The component breakout of both systems is listed below:

Component	Number of units used in—	
	AN/TCC-45	AN/TCC-46
Multiplexer TD-352/U.....	2 each.....	.....
Multiplexer TD-353/U.....	.....	1 each.....
Multiplexer TD-202/U.....	1 each.....	.....
Multiplexer TD-203/U.....	.....	1 each.....
Multiplexer TD-204/U.....	2 each.....	2 each.....
Converter CV-1548/G.....	do.....	4 each.....
Restorer TD-206/G.....	(1).....	(1).....
Test set AN/PTM-7.....	1 each.....	1 each.....

<sup>1</sup> Used in cable systems but procured separately.

A brief description of the components is presented below:

(1) *Multiplexer TD-352/U*.—Receives and transmits 12 voice channels over radio or cable using pulse code modulation, time division multiplexing techniques.

(2) *Multiplexer TD-202/U*.—This is an interface unit between the TD-352/U and the associated radio. The TD-202/U conditions the output of the TD-352/U for transmission by the radio. In turn, it conditions incoming radio signals for input into the TD-352/U. It is also capable of combining the outputs of two Multiplexers, TD-352/U, thus providing 24 channel operation.

(3) *Multiplexer TD-533/U*.—A 48 channel version of the 12 channel TD-352/U.

(4) *Multiplexer TD-203/U*.—Performs the same interface function for TD-353/U that the TD-202/U performs for the TD-352/U.

(5) *Multiplexer TD-204/U*.—This is a dual capability interface unit which transmits and receives signals over cable to and from Multiplexer TD-353/U. In addition, it can handle a single TD-352/U or a combination of two TD-352/U.

(6) *Converter, Telephone Signal CV-1548/G*.—The converter is used to interface telephone switchboards and Multiplexers TD-352/U and TD-353/U. Each converter provides signalling capability for 12 voice channels.

(7) *Restorer Pulse Form TD-206/G*.—The restorer is an unattended line repeater used at one mile intervals in a cable system to regenerate cable signals.

(8) Test Set, Telephone AN/PIM-7.—The test set is used to trouble shoot cable and Restorers in a cable system.

b. The Multiplexer TD-754/G and TD-660/G were developed in response to the need for units with 6 channel capability. 6 channel capability was required in order to abide by existing international agreements on the use of the radio frequency spectrum. Both units were developed using technology more advanced than the previously described units. The TD-660/G and TD-754/G are smaller, lighter, more reliable, and can be used in place of their counterparts TD-352/U and TD-204/U respectively.

1. *Development/production history of pulse code modulation components:*

a. Development of a Pulse Code Modulation (PCM) Telephone Carrier System (AN/TCC-45 and 46) was begun in 1958. The program included development of transistorized PCM multiplexers, cable terminals, radio terminals and accessories to replace the existing Telephone Carrier System (i.e. Frequency Division Multiplexers AN/TCC-7 and AN/TCC-50, Repeaters AN/TCC-8 and AN/TCC-11 and Pulse Position Multiplexer AN/TCC-13). The new system was designed to provide the Army with better quality telephone service using lower cost, more reliable, and easier to operate equipment. In addition, this system could provide encoding which was not, practical with the previous system.

b. Two systems were developed, one providing 12 and 24 channels and one providing 48 and 96 channels. A production contract for this equipment was awarded to Raytheon Company in August 1964.

c. In 1962, development was begun on a third PCM system providing 6 telephone channels, (to replace Frequency Division Multiplexer AN/TCC-3 Repeater and Converter TA-182/U and AN/TCC-5). The system contained four equipments. Multiplexers TD-660/G, TD-754/G, Telephone Signal Converter CV-1548 and Key Generator TSEC/KG-27. Production contracts for the TD-660/G and the CV-1548/G were awarded to Raytheon Company in August 1964, November 1966, and June, November and December 1968. At the present time the PCM system components (TSECKG27, CV-1548/G, TD-754/G, and TD660A/G) are being procured competitively.

d. All three PCM systems were developed by Raytheon Company under contracts DA-36-039-SC-78148, DA-36-039-SC-90768, and DA-28-043-AMC-01686 (E). The development contracts were awarded after competitive negotiation. In each instance, Raytheon was selected on the basis of its superior technical proposals. Contract DA-043-AMC-00332 (E), for service test models of the TD-660/G, TD-754/G, was awarded noncompetitively to Raytheon Company as the most qualified firm, by virtue of the company's experience in supplying engineering models of the equipment.

e. A total of nine contracts were awarded to Raytheon Company for the development and production of these three systems. Four of these contracts were for development at a total cost of \$12,286,375. The remaining five (5) contracts were for production of the equipment. A total of 12,467 production units have been *delivered* to date at a total cost of \$81,050,907. This cost includes gauges, spare parts, technical manuals, production drawings, special test equipment, and ancillary equipment amounting to \$12,065,207.00. A summary of *all awards* for PCM and related equipments is at TAB A.

The average unit cost for production units delivered to date is listed in the following table:

Unit	Quantity	Average price
Multiplexer TD-202/U .....	1,057	\$5,070
Multiplexer TD-203/U .....	200	7,666
Multiplexer TD-204/U .....	2,254	5,390
Restorer TD-206/G .....	2,000	448
Multiplexer TD-352/U .....	1,383	9,220
Multiplexer TD-353/U .....	200	19,748
Multiplexer TD-660/G .....	400	19,010
Converter CV-1548/G .....	4,035	4,780
Test set AN-PTM-7 .....	380	1,594
TD-660A/G .....	558	9,980

The following listed units are presently on order with Raytheon, with deliveries scheduled to end at the time deliveries on competitive contracts for these units begin:

Unit	Quantity on order	Average price
Multiplexer TD-660A/G .....	1,217	6,408
Converter CV-1548/G .....	1,820	3,546

f. A total of four production contracts has been competitively awarded for PCM components. 2343 production units have been delivered at a total cost of \$5,245,591.00. This price does not include spare parts, special test equipment, gauges, technical literature and ancillary equipment amounting to \$3,274,524.00. The average unit costs for the production units delivered to date are listed below:

Unit	Contractor	Quantity	Average price
Multiplexer TD-202/U .....	Honeywell .....	630	1,988
Multiplexer TD-204/U .....	do .....	1,139	1,624
Multiplexer TD-352/U .....	do .....	574	3,735
Multiplexer TD-660A/G .....	do .....	0	13,375
Converter CV-1548/G .....	Acton .....	0	1,440

<sup>1</sup> Contractual price, no items delivered to date.

g. At TAB B is an analysis of the total number of units purchased from all sources, showing cost, quantity purchased and average prices.

h. Summary and pictures of each of the equipments are inclosed at TAB C.

2. The following history of awards describes each PCM related contract in Chronological order:

a. *Background for Contract DA-36-039-SC-781*<sup>1</sup>8: (Raytheon):

Contract price—\$4,853,015 (\$4,535,528 plus \$317,487 fee); final price—\$6,815,572 (\$6,485,670 plus \$329,902 fee); contract type—cost plus fixed fee; date of award—27 June 1958; and purpose of contract—development and fabrication of engineering and service test models of *medium* and *high capacity* PCM Multiplexer Systems.

A development program was initiated and ten (10) solicitations were issued during the second quarter of calendar year 1958. Proposals were received from six (6) firms. Four of the proposals were judged unacceptable from a technical view point. (See TAB D) Award of a cost plus fixed fee contract was made to Raytheon Company on the basis of its superior technical offer.

The contract called for development and fabrication of engineering and service test models technical reports, drawings, and technical literature. Engineering model deliveries were completed in 1961. Service test model deliveries were completed in 1964. The contract was modified a total of thirty-one (31) times. Contract total cost was increased by \$1,962,427 and fee by \$12,415 to \$6,815,442 (cost) and \$329,902 (fee). Part of the increase in cost \$233,139 and fee (\$12,415) was due to engineering changes resulting from security requirements, and other changes to improve the equipment, indicated by Service testing. The balance of the increase in cost (\$1,729,288) with no increase in fee was due to underestima-

tions of contract cost. The 1958 cost estimates, were revised in 1961 following delivery of the engineering models. At that point the contractor was better able to project his costs based on experience. The resultant increases reflected the application of additional manpower, and rising material costs.

Engineering and Service Test models of Multiplexers TD-202/U, TD-203/U, TD-204/U, TD-352/U, TD-353/U, Ressorer TD-206/G, Test Set AN/PTM-7 and TSEC/KG-5 were developed and delivered starting in May 1960 and completed in July 1961.

*b. Background for Contract DA-36-039-SC-90768: (Raytheon):*

Contract price—\$652,673 (\$607,073 plus \$45,600 fee); final price—\$1,331,716 (\$1,265,224 plus \$66,492 fee); contract type—cost plus fixed fee; date of award—25 May 1962; purpose of contract—development and fabrication of engineering models of low capacity (six channel) PCM Multiplex System.

A development program was initiated and fifteen (15) solicitations were issued during the first quarter of calendar year 1962. Proposals were received from seven (7) firms. Four of the proposals were judged unacceptable from a technical view point. (See TAB D) Award of a cost plus fixed fee contract was made to Raytheon Company based upon its superior technical proposal. The contract called for development and fabrication of engineering models and technical reports. Model deliveries were completed in 1964. The contract was modified a total of sixteen (16) times. Contract total cost was increased by \$679,043 and fee by \$66,492 (fee). Part of the increase in cost (\$285,847) and fee \$20,892) was due to additional quantities of Converters CV-1548/G and CV-1549/G, manufacturer's drawings and technical manuals. The increase in cost (\$393,196) with no change in fee reflected underestimation of costs. Equipment produced on this contract is listed below:

ENGINEERING MODELS

Unit	Original delivery schedule	Revised delivery schedule	Quantity produced
Multiplexer TD-660/G.....	Jan. 31, 1964	Nov. 30, 1964	8
Power supply PP-3802.....	Aug. 15, 1963	.....do.....	8
Converter CV-1548/G.....	.....do.....	June 15, 1963	16
Converter CV-1549/G.....	Dec. 22, 1963	Sept. 30, 1963	12

*c. Background for Contract DA-28-043-AMC-00332(E): (Raytheon):*

Contract price—\$1,268,837; final price—\$2,012,575; contract type—fixed price incentive (cost only) fee; date of award—30 June 1964; and purpose of contract—development and fabrication of service test models for the low capacity system.

On 3 April 1964 a RFP was issued on a sole source basis to Raytheon Company, for sixteen (16) each Multiplexer (TD-660) and eight (8) each Cable Combiner (TD-754) with option to purchase a Technical Data Package. The option for a Technical Data Package consisted of:

- (1) Drawings.
- (2) Four (4) each Procurement Models of Item (TD-660).
- (3) Four (4) each Procurement Models of Item (TD-754).

The sole source justification for these items was based on the following:

(1) This contractor has an exceptionally qualified staff with extensive background in the intricate details of this development. The proposed contractor had been active on similar type systems since 1958.

(2) The know-how and techniques used by this contractor in the fabrication of the engineering test models of this equipment under Contract DA-36-039-SC-90768, were directly applicable to this procurement. In addition, Raytheon Company was the prime developer for auxiliary equipment which was being designed primarily for use with the equipment called for under this procurement. This contractor had obtained invaluable information as to the detailed design of the equipment, fabrication techniques, and specialized tools peculiar to this equipment.

(3) In addition, at that time, technical information, procurement samples, and procurement data had not been developed sufficiently for multiple source solicitation. Any other source would have required extensive major engineering effort to reach the present state of development attained by Raytheon Company Award, to a contractor other than Raytheon Company would entail con-

siderable duplication of effort, loss of time in becoming familiar with the work being done, increased cost, divided responsibility, and increased coordination burden.

Based on the above information, authority to negotiate a contract with Raytheon was granted by Willis M. Hawkins, Assistant Secretary of the Army (R&D) on 1 April 1964.

The contractor produced the service test models of the TD-660/G. While these units were undergoing service test, an urgent Vietnam requirement arose for immediate production of a low capacity system. 400 TD-660/G were produced on an expedited, limited production basis. Since these models reflected service test results they were markedly superior to the service test models manufactured under the instant contract. Thus, no basis remained for buying the TD-660/G portion of the technical data package on this contract, accordingly the contract is in the process of being modified. Later action to obtain procurement data on the improved TD-660/G is described in the summary of contract DAAG07-68-C-0332, (paragraph 2i page 12).

d. *Background for Contract DA-36-039-AMC-04878(E) : (Raytheon) :*

Contract price, \$22,774,088.00 (later increased to \$64,963,362.00); date of award—19 August 1964; and purpose of contract—production of the units listed below with running spare parts, tools, technical literature and production drawings.

Unit	Original quantity	Final quantity
Multiplexer TD-202/U .....	280	1,057
Multiplexer TD-203/U .....	100	200
Multiplexer TD-204/U .....	960	2,254
Multiplexer TD-352/U .....	560	1,383
Multiplexer TD-353/U .....	100	200
Restorer TD-206/G .....	2,000	2,600
Converter CV-1548/G .....	960	4,035
Test set AN/PTM-7 .....	380	380

(1) Raytheon Company had spent approximately four (4) years in the development of these specialized equipments under the R&D contract DA-36-039-SC-78148 at a total cost to the Government of approximately \$7,000,000. It had acquired extensive knowledge and "know-how" in developing and producing the new electronic concepts in the equipment which were time division multiplexing, pulse code modulation, high-speed digital transmission, digital regeneration, digital detection, synchronization and framing. These new concepts represent the first use thereof in tactical military equipment.

(2) The procurement package available from the development contract (#78148) consisted of a performance specification, procurement model, and shop drawings. The shop drawings could be used for informational purposes only and were not suitable as a procurement standard. Because contract effort to date had been limited to development of the equipments, it had not been feasible to procure production drawings, since the development items would differ in numerous details from the item as standardized for production.

(3) The PCM equipment was a newly developed equipment at the time of this first production contract. It employed techniques which were novel in communications systems, such as, sampling, coding, high speed digital transmission via both cable and radio, was fully transistorized, used modular construction and throw-away modules for circuit construction. At this time there was no other commercial concern in the US outside of the Bell System, that had the background and experience that Raytheon had in PCM systems. The Bell System differed, however, in system application, electrical performance requirement and mechanical and environmental performance characteristics.

(4) At the time of the award of Contract DA-36-039-AMC-04878(E) condition were:

(a) Communication capability of the Army Area Communications System with US Seventh Army in USAREUR was operating near its maximum potential which could result in failure to maintain effective communications media in event of an emergency. The condition was caused due to use of Telephone Terminal AN/TCC-7 (which is a 12 channel multiplexer employing "frequency division modulation") with Radio Set AN/GRC-50 (which is a radio capable of being used with equipment containing "frequency division modulation" or "pulse code

modulation"). The 12 channels of an AN/TCC-7 occupy the same frequency spectrum as the 24 channels of the AN/TCC-45. Hence, only fifty percent (50%) of the channel capability of AN/GRC-50 is the theoretical amount that can be used.

(b) Although the AN/TCC-7 possesses 12 channels, the maximum effective number of channels that can be used simultaneously is seven, since otherwise crosstalk between channels will affect transmission quality. In the AN/TCC-45, all channels can be operated at the same time without crosstalk between channels. Therefore, as a basis of comparison, it was necessary for Army Area Communications System of US Seventh Army to use three (3) each Radio Sets AN/GRC-50 and three (3) each AN/TCC-7 to achieve a communication capability which, on the other hand, could be obtained by use of one (1) Radio Set AN/GRC-50 and one (1) AN/TCC-45 with a resultant conservation of personnel and improved efficiency in power consumption, shelter requirements for housing the equipment, and ease of maintenance.

(c) The proposed procurement of AN/TCC-45 equipments was to be used to effect the required improvement in the communications capability of USAREUR.

(5) In view of the urgent need, Raytheon's substantial know-how, the amount already invested by the Government, the long lead time for a new producer, it was decided to seek Secretarial approval to negotiate a contract with Raytheon. Negotiation with Raytheon was justified under Authority 10 U.S.C. 2304 (a) (14) ASPR 3-214.1 in that:

(a) Preliminary engineering and development work had been performed by the proposed contractor which would not be useful to or usable by any other supplier.

(b) Substantial time and effort have already been expended by Raytheon Company in developing the prototype models of these equipments.

(c) An additional fifteen months above that available from the proposed contractor would be required for a new source and would necessitate delaying planned establishment of required pulse code modulation communications systems.

(6) A request for Secretarial Determination and Findings under 10 U.S.C. 2304 (a) (14) and ASPR 3-214.1 was forwarded through channels on 7 February 1964. Final approval for this procurement was given by Willis M. Hawkins, Assistant Secretary of the Army R&D on 1 April 1964.

(7) A breakout of the major modifications that affected this contract are as follows:

(a) Modification No. 6, dated 24 February 1966, requirements for 61 each Multiplexer, TD-352/U; 61 each TD-202/U; 69 each Converter, Telephone Signal CV-1548/G; 255 each Multiplexer, TD-204/U, and concurrent Repair Parts in the total amount of \$3,905,005.00. The lack of competitive procurement data and an urgent need for these items to equip the Army with a secure multi-channel communications system made it necessary that the procurement be effected on a sole source basis. The urgency did not permit deferment of the planned FY-66 buy pending production from a competitive contract planned for award in FY-67.

(b) Modification No. 9, dated 28 April 1967, definitized by Supplemental Agreement to Letter Contract No. DAAB05-67-C-1919, awarded 21 September 1966 for 185 each Multiplexer, TD-202/U; 633 each Multiplexer, TD-204/U; 675 each Multiplexer, TD-352/U; 338 each Running Spare Parts Kits for Multiplexer, TD-352-/U; 288 each Converter, Telephone, Signal CV-1548/G, concurrent repair parts and contractor furnished services in the total amount of \$9,097,605.00 or approximately 58% of the total estimated cost of the contract. The letter contract was subsequently amended to \$11,097,605.00. This increase of \$2 million was due to purchases from the current producer to secure timely replenishment of quantities to satisfy the build-up in Southeast Asia. Procurement data for competitive bidding was not available at that time (July 1966). The defining Supplemental Agreement (Mod 9) was in the total amount of \$15,559,740.00 and included an acceleration cost of \$3,027,629.00; \$792,510.00 was applied against the level of effort; while the remaining balance of \$2,235,119.00 was prorated over the cost of the items in the basic contract.

(c) Modification No. 12, dated 23 June 1967, definitized by Supplemental Agreement the Letter Contract No. DAAB05-67-C-1224, awarded 30 December 1966 for 808 each Converter, Telephone Signal CV-1548/G, with concurrent repair parts, in the amount of \$2,222,000.00. (Defined amount \$3,803,191.00). Procurement data for competitive bidding was not available at that time (December 1966). These equipments were likewise required with maximum speed and placement of the

award with Raytheon was the only means by which the Government's needs could be satisfied in a timely manner.

(d) Modification No. 13, dated 30 June 1967, added 100 each Multiplexer, TD-203/U, including running spares, in the total amount of \$804,300.00. Competitive procurement data in the form of drawings and additional technical information was not available for the procurement of the desired item, which was urgently required in Southeast Asia for acceleration of the AN/TRC-111 sub-system. Award to the developer and producer, Raytheon, was the only means of effecting timely delivery.

(e) Modification No. 16, dated 15 December 1967, definitized, by Supplemental Agreement, the letter Contract No. DAAB05-67-C-1229, awarded 27 June 1967 for 484 each Multiplexer, TD-204/U, in the total amount of \$2,569,400.00. Although adequate data was available for competitive procurement, a request for approval to "shift" from competitive to non-competitive procurement was approved by the Assistant Secretary of the Army (Installations and Logistics) on 15 June 1967. The approval recognized the critical shortages of tactical high capacity multi-channel carrier communications equipment in Southeast Asia. The required delivery for this quantity of TD-204/U could only be met by award to the current producer. The competitive procurement awarded in May 1967 would not provide equipment in time to satisfy this need. The production lead time for the multi-year procurement is 18 months with delivery to start November 1968. However, compliance with the accelerated schedule now requires delivery to start in February 1968 and be completed in August 1968. Raytheon was the only one capable of meeting this delivery requirement.

(f) Modification No. 21, dated 29 February 1968, in the amount of \$10,132,723, definitized by Supplemental Agreement the letter, Contract No. DAAB05-68-C-0606, awarded 29 September 1967. The letter contract called for 1910 each Converter, Telephone Signal CV-1548/G and Multiplexer, TD-353/U, with associated ancillary items and concurrent repair parts. Competitive procurement data was not available to cover the above requirements. The equipment was urgently needed to supply communication capabilities for Southeast Asia. Since the requirement is a continuation of the present production line, negotiation and award to Raytheon represented the only timely means of meeting these communication needs.

(g) Modification No. 23, dated 20 May 1968, definitized by Supplemental Agreement the letter Contract No. DAAB05-68-C-0609, awarded 4 January 1968. The letter contract called for 170 each Multiplexer, TD-202/U with 85 each Running Spare Parts Kits; 555 each Multiplexer, TD-204/U with 185 each Running Spare Parts Kits, with associated ancillary items, in the total amount of \$2,156,584.00. Although adequate data was available for competitive procurement, a request for approval of "shift" from competitive to a non-competitive procurement was approved by the Assistant Secretary of the Army (Installations and Logistics) on 26 December 1967. The items were required for Southeast Asia as part of the communication build-up. These components were required for installation in the AN/TCC-60, AN/TRC-110, and AN/TRC-117 facilities, then being fabricated at Army depots under Quick Reaction efforts. The competitive procurement awarded in May 1967 would not provide equipment in sufficient time to meet the required delivery. The definitive Supplemental Agreement was in the amount of \$3,653,416.00. Raytheon was the only company capable of providing these components within the required time frame. Urgency would not permit the 21 month production lead time required by a new producer.

*e. Background for Contract DA28-043 AMC-01686 (E) (Raytheon):*

Contract price—\$1,505,958; final price—\$2,126,642; date of award—8 September 1965; purpose—development and fabrication of service test models of TSEC/KG-27.

1. The proposed procurement called for the development and fabrication of sixteen (16) models of a security device for use with a Forward Area Pulse Code Modulation Communication System. The contractor was also required to furnish ancillary items such as a design plan, test plan, repair and maintenance manuals. The RFQ included an option to procure a Technical Data Package consisting of four (4) procurement models identical to the engineering development models and a complete set of drawings.

2. Since June 1963, Raytheon had been actively engaged in the design and development of Advanced Development models of this equipment. This procurement called for furthering this development, therefore, the continuation of this work with any other contractor at this point in the development program would

result in additional cost, loss of acquired experience, and delay. Negotiation of this procurement was approved as part of a class determination and findings by the Assistant Secretary of the Army on 1 April 1964. Contract price increases included exercise of the option for drawings (\$198,162) Engineering Changes (\$72,000). There were two Engineering Changes on the basic development contract for the KG-27. The first was a \$15,000.00 change concerning updating of tech data. The second was a change of \$57,000.00 involving a mother board printed circuit. This redesign of an interconnecting board (mother board) was done to improve the producibility, production cost and reliability of the 13823 printed circuit. A unit cost reduction of between \$150-\$250 is expected. In addition of the unit cost reduction, this change will result in reduction in production engineering effort on the production contract. Included in the \$57,000.00 was a set of drawings which will be utilized in effecting the change in the initial production contract and will save on redesign effort by any prospective contractor. The remaining increases were caused by underestimated costs (\$351,624).

f. *Background for Contract DAAB07-67-C-0167 (Raytheon):*

Contract price—\$2,000,000 (letter contract); \$7,805,000 (definitive contract) (later increased to the current price of \$14,092,133.75); date of award—30 November 1966; purpose of contract—purchase of 400 each Multiplexers, TD-660/G and ancillary items:

(1) An urgent requirement was received for 400 each Multiplexers TD-660 having a MILSTRIP Priority 02, i.e. key equipment, essential to the Army mission accomplishment and urgently needed for combat readiness. Delivery of this equipment was required beginning 1 May 1967. In order to meet urgent Army needs the Department of the Army (Office of the Chief, Research and Development) granted limited production type classification approval on 20 October 1966 for 400 each Multiplexers, TD-660/G, plus the option quantity of 350 each. An immediate award was essential in order to obtain the equipment in the required time frame. In addition, adequate procurement data which could enable competitive solicitation was not available. Consistent with the circumstances, a letter contract was placed with Raytheon Company on 30 November 1966 for 400 each Multiplexers, TD-660/G, and ancillary items, such as running spare parts, repair parts, literature, special tool list, etc. The letter contract was in the amount of \$2,000,000. This amount represented less than 50% of the total estimated cost of the contract (\$5,520,000.). The definitive contract was executed on 26 October 1967 for a total price of \$7,805,000. A 100% option provision was included in the definitive contract. The increase in cost, \$2,285,000.00, from the estimated definitive amount of the letter contract was attributed to costs associated with first time production, inadvertently omitted from the government estimate.

(2) On 31 October 1967 the government exercised its option for an additional 350 Multiplexers, TD-660/G. This added equipment was likewise required for support of combat operations in Southeast Asia. The option price (\$10,889 per unit) was substantially lower than the unit price (\$19,010.) paid for the Multiplexers under the basic contract. The difference was mainly attributed to the fact that the contractor amortized has set-up charges, special tooling expenses, and test equipment over the production of the first 400 units.

(3) Subsequent modifications added engineering changes and ancillary items such as running spare part kits, concurrent repair parts, etc. As a result of certain engineering changes, the unit price (\$19,010.00) of the 400 each Multiplexers was decreased to \$18,968.53, and the option unit price (\$10,889.00) of the 350 each Multiplexers was increased to \$11,680.00. The decrease (\$41.47 per unit) for the 400 each was attributed to the deletion of test equipment (infrared test station). The increase (\$791.00 per unit) for the 350 each was attributed to the incorporation of a tempest capability (electrical design which prevents the loss of classified information through inadvertent emanations such as electromagnetic radiation). This capability was not included in the 400 each since it would have adversely affected delivery of the equipment.

(4) The total contract price as modified was \$14,092,133.75. The average unit price of the Multiplexers, TD-660/G was approximately \$15,567.21 for a total of \$11,675,412.00. The \$2,416,721.75 balance of the contract price is for other engineering changes (\$281,566.00), running spare part kits (\$917,379.75), concurrent repair parts (\$1,023,400.00 and other ancillary items).

(5) Delivery of the 750 each Multiplexers was required beginning 30 September 1967 and ending 31 December 1968. Delivery commenced 6 October 1967 and was completed in January 1969.

(6) Standard A type classification was granted by the Department of the Army on 6 June 1968.

*g. Background for Contract DAAB05-67-C-1225*

Contractor—Honeywell, Inc., Tampa, Florida; contract price—\$22,788,816; current contract price—\$24,942,966; date of award—30 November 1967 (3 year multi-year); purpose of contract—procurement of items: 1955 each Multiplexers TD-202/U, 1220 each Multiplexers TD-252/U, and 5343 Multiplexer TD-204/U.

1. The procurement of the above Multiplexer item was made on a competitive basis because of procurement data being available, also the urgent logistical problems had been satisfied. The continuing buys are required to support the AACOMS Project Manager facility program.

2. Solicitations were mailed to 24 firms in the industry, six (6) bids were received (TAB F). Stelma, Inc., was low bidder on single year program however the offer was not considered to be responsible due to lack of technical and production capability as well as the ability to meet the delivery schedule. The contract was awarded to Honeywell Inc., because they submitted the lowest proposal on the Multi-Year Procurement. By the Government exercising the option provision of the contract at a cost of (\$2,124,670) plus Engineering Change Proposal, the contract price was increased to \$24,042,966. Deliveries of these items were to begin in November 1968 and be completed in May 1970. At the present time the contractor has delivered on schedule.

*h. Background for Contract No. DAAB05-C-0613*

Contractor—Honeywell, Inc., Tampa, Florida: contract price—\$1,801,735.00 (original); \$1,658-805.00 (current); date of award—30 November 1967; purpose of contract procurement of PCM equipment—450 each TD-202()/U, 145 each TD-204()/U, 73 each kits, TD-204()/U, 140 each TD-352()/U, 70 each kits TD-352()/U and miscellaneous test equipment.

(1) The above PCM components were urgently required for Southeast Asia to fulfill General Johnson's plan to supply communication capabilities. Delivery of these components was required beginning in December 1967 for installation in the AN/TCC-60, AN/TRC-110 and AN/TRC-117 facilities being fabricated under Quick Reaction Depot efforts. A new company would require a minimum of 18 months lead time to initial production while Raytheon and Honeywell would require only 12 months. As a result, it was determined to limit negotiation to two (2) companies, Honeywell and Raytheon, who could deliver the components in the required time frame.

(2) Solicitations were restricted to two companies, Honeywell, Inc. and Raytheon Company. Raytheon submitted a total price of \$3,646,208.00; Honeywell's total price was \$1,801,735.00. On 30 November 1967 an award was placed with Honeywell based upon price competition in the total amount of \$1,801,735.00. Subsequent modifications incorporated engineering change proposals (not yet definitized) and deleted running spare parts kits for the Multiplexer TD-202/U (\$142,930.00). The total contract price as modified to date is \$1,658,805.00.

(3) Delivery for the 450 each TD-202/U multiplexers items was scheduled to commence on 31 January 1969 and end by 30 September 1969. The balance of the equipment was scheduled for completion by 30 November 1968. As a result of the impact of the engineering changes, the delivery schedule was modified as follows:

TD-202()/U Multiplexer—start 31 March 1969 and end 30 November 1969. The balance of the components were scheduled for completion by February 1969.

Delivery of the other components have been completed.

*i. Background for Contract DAAB07-68-C-0332 (Raytheon):*

Contract price—\$4,615,000.00 (letter contract); \$3,309,300.00 (definite contract); date of award—28 June 1968; purpose of contract—procurement of 355 each Multiplexers, TD-660A/G with ancillary items.

(1) Here, as in the previous instance a compelling combat need arose for 355 Multiplexers, TD-660A/G, plus ancillary items. Delivery was required beginning in February 1969. "In order to preclude any slippage in the deployment of these Multiplexers to Southeast Asia and the fact that competitive procurement data was not available, it was determined to place a letter contract with Raytheon Company who had a hot production line and could deliver the equipment in the required time frame. A letter contract was awarded to Raytheon on 28 June 1968 for 355 each Multiplexers, TD-660A/G, production drawings, and ancillary items such as running spare parts, changes to provisioning documentation, extender panels, etc. The letter contract was in the amount of \$4,615,000.00. This amount represented 100% of the estimated cost. The definitive contract was executed on 17 January 1969 for a total price of \$3,309,300.00. The Government's estimate of \$4,615,000.00 was based on the option price (\$10,889.00 per unit) paid under contract 0167 plus the additional technical requirements for preconditioning of the

equipment and the incorporation of the tempest capability. As it turned out Raytheon's price was considerably lower as noted below.

(2) The total contract price to date is \$3,309,300.00. The unit price for the 355 Multiplexers, TD-660A/G is \$7,931.00, for a total of \$2,815,505.00. The balance, \$493,795.00, is for production drawings (\$133,959.00), running spare part kits (\$334,210.00), and other ancillary items.

(3) Delivery of the production quantities was scheduled to commence 28 February 1969 and end 31 August 1969. To date a total of 208 units has been delivered on schedule. The running set of drawings was delivered in November 1968 and the final set is required concurrent with delivery of the last production quantities (31 August 1969).

(4) The difference (\$7,636.21 per unit) between the average unit price (\$15,567.21) of the Multiplexers under Contract 0167 and the unit price (\$7,931.00) cited in paragraph 2 above is mainly attributed to (a) contractor experience obtained in producing this equipment over a two year period including a reduction in the learning curve, and (b) set-up charges including tooling and test equipment were not required.

*j. Background for Contract DAAB05-69-C-1101 (Raytheon):*

Contract price—\$3,822,000 (letter contract); increased to—\$4,700,000; current definitized price—\$6,456,343; date of award—29 November 1968 (definitized 30 April 1969); purpose of contract—procurement of 1820 each converter, telephone signal CV-1548A/G.

Raytheon Company, the developer and producer of the CV-1548A/G was awarded a letter contract on 29 November 1968 for 1820 each Connector Telephone Signal CV-1548A/G. The equipment is being procured for the Army Area Communication System and is urgently required to meet the objectives of force deployability within the communication posture of the Army. Classified information is involved in the discussion of the urgency of this requirement. The letter contract calls for the delivery of the CV-1548A/G to begin in August 1969 and continue through April 1970.

While complete procurement data was available for this equipment in August 1968, the short delivery scheduled dictated award to the current producer. Any other source would have required approximately 18 months from the date of award to delivery of first production. This procurement of the CV-1548A/G was approved by the Assistant Secretary of the Army (I&L) on 14 November 1968.

*k. Background for Contract DAAB05-69-C-1021 (RAYTHEON)*

Contract price—\$3,068,398 (letter contract); increased to—\$4,497,347; quote—\$7,268,226; date of award—31 December 1968 (not definitized) purpose of contract—procurement of 1070 each Multiplexer TD-660()/G.

Delivery of this equipment was required in August 1969. Raytheon was the only firm capable of meeting this urgent delivery date, (eight (8) months production lead time of 21 months. A letter contract was awarded to Raytheon on 31 December 1968 for 1070 each Multiplexer TD-660/G with delivery to start in August 1969 and end in July 1970 at a maximum rate of 95 units per month. The urgency of the procurement was established in Department of the Army Classified Message #871296, dated 8 July 1968, subject: RA Evaluation of AACOMS Multichannel Equipment Requirement/Assets. Approval to shift to the current producer was granted by the Assistant Secretary of the Army for Installation and Logistics on 18 December 1968.

*l. Background for Contract DAAB05-69-1031 (Action Laboratories, Inc.)*

Contract price \$11,061,031.52 (r year multi-year contract);

Date of award—29 April 1969;

Purpose of contract—procurement and 7638 Converter, telephone signal CV-1548()G.

The requirements for this time over the next four years met the Multi-year procurement concept of ASPR. Procurement Data was suitable for competitive solicitation and there were sufficient firms capable of manufacturing the item. Administrative and production lead time was adequate to solicit by formal advertising. Invitation for Bids were mailed to 147 firms, 26 bids were received. Award was made to the lowest responsive responsible bidder, Action Laboratories, Inc. On 29 April 1969 for a total amount of \$11,061,031.52. Production quantities are to be delivered starting 21 October 1970 and ending 7 June 1973.

m. *Background for Contract DAAB05-69-C-1036 (Honeywell Inc., Tampa, Fla.:*

Contract price—\$1,765,422.00; date of award—29 May 1969; purpose of contract—procurement of 425 each Multiplexer TD-660/G with ancillary items.

Because of the urgency of the requirements negotiations were limited to electronics firms capable of submitting a first article for test in ten (10) months, with production delivery six (6) months later. Solicitation was made to four (4) firms, three of which submitted bids, Honeywell, Inc. \$1.7 million, General Atronics Corp. \$2.5 million, and Raytheon Company \$2.6 million. The award was made to Honeywell, Inc. on a firm fixed price based upon lowest price. The delivery of the end items are to begin in October 1970, at a maximum rate of 100 each month.

Date	Contract No.	Dollar value	Equipment	Type buy	Contract
June 1958	DA36-039-SC-78148	\$6,815,442.00	TD-352/U, TD-203/U, TSEC/KG-5, TD-353/U, TD-202/U, TD-204/U, TD-206/G and AN/PTM-7	R.D.T. & E.	Raytheon.
May 1962	DA36-039-S-C-90768	1,331,716.08	TD-660/G, PP-3802, CV-1548/G & CV-1549/G	R.D.T. & E.	Do.
June 1964	DA28-043 AMC-00332(E)	2,012,575.00	TD-660, TD-754	R.D.T. & E.	Do.
August 1964	DA36-039 AMC-04878(E)	64,963,362.00	TD-202/U, TD-203/U, TD-204/U, TD-352/U, TD-353/U, TD-206/G, CV-1548/G and AN/PTM-7	Pema.	Do.
September 1965	DA-28-043 AMC-01686(E)	2,126,642.00	TSEC/KG-27	R.D.T. & E.	Do.
November 1966	DAAB07-67-C-0167	14,092,133.75	TD-660/G	Pema	Do.
May 1967	DAAB05-67-C-1225	24,942,966.00	TD-202/U, TD-204/U, TD-352/U	Pema	Honeywell.
November 1967	DAAB05-68-C-0613	1,658,805.00	TD-352/U, TD-202/U, TD-204	Pema	Do.
June 1968	DAAB07-68-C-0332	3,309,300.00	TD-660A/G	Pema	Do.
November 1968	DAAB05-69-C-1011	6,456,343.00	CV-1548A/G	Pema	Do.
December 1968	DAAB05-69-C-1012	17,268,226.00	TD-660A	Pema	Do.
April 1969	DAAB05-69-C-1031	11,061,031.52	CV-1548/G	Pema	Do.
May 1969	DAAB05-69-C-1036	1,165,422.00	TD-660/G	Pema	Do.

<sup>1</sup> Contract not definitized—cost estimated.

Acton Lab, \$11,061,031.52; Total, \$147,803,964.35—R.D.T. & E., \$12,286,375.08—Pema, \$135,517,589.27.

Note: Total dollar value of contracts: Raytheon, \$108,375,739.83; Honeywell Inc., \$28,367,193;

AUGUST 1964

## CHRONOLOGY OF EVENT LEADING TO 1ST COMPETITIVE PROCUREMENT PACKAGE FOR MULTIPLEXERS TD-202, TD-204 AND TD-352

- 19 August 1964, Contract DA-36-039-AMC-04878(E) awarded to Raytheon.
- June 1965, 1st Article samples due.
- 2 November 1965, 1st Article testing started.
- 21 June 1966, 1st Article testing completed.
- 23 September 1966, 1st running set drawings were submitted to ECOM.
- 16 November 1966, Drawings for TD-204 cleared into system.
- 12 January 1967, Drawings for TD-202 cleared into system.
- 16 January 1967, Drawings for TD-352 cleared into system.
- 13 January 1967, Specifications updated to include changes.
- 12 January 1967, Procurement data package prepared for competitive buy.
- 25 January 1967, 1st Article approved.
- 27 February 1967, Competitive IFB on street for above items.
- 28 February 1967, 1st Production units delivered 24-202's, 28-204's; 15-352's.
- 12 May 1967, Competitive award to Honeywell.
- November 1968, 1st delivery of production units from Honeywell.

This schedule shows an accelerated effort to obtain competitive procurements because:

a. A running set of drawings will reflect equipment that is not generally the final delivered equipment. The risk in using same is increased cost to the Government because of necessary directed changes. This command elected to take this risk to get into an early competitive status.

b. Competitive procurement data was prepared and efforts were underway to award a competitive contract prior to delivery of the 1st production units from Raytheon.

1st production deliveries occurred in February 1967 and in May 1967 as a result of a competitive IFB, Honeywell was awarded a contract for delivery of quantities of TD-202, TD-204 and TD-352.

It is noted that delivery requirements for these items prior to the November 1968 deliveries from Honeywell could only be obtained from Raytheon.

## TD-660

1. The 1st delivery of Tempest Clean Standard—A version of the TD-660 was made in 1st quarter FY-69. A Running Set of drawings was delivered in November 1968. They were cleared in the system in December 1968. Procurement data was prepared using drawings and specifications in January 1969. An IFB was issued in March 1969 with an award scheduled in June 1969.

2. It is noted from the above that all effort was extended to obtain a competitive procurement after receipt of drawings from the Contractor. This competitive procurement is based on use of a Running Set of drawings and will likely result in increased contract price because of changes that will be required.

Chairman PROXMIRE. Now, Mr. Bowers, I am informed that several of the partners in Salomon Bros., one of the firms financing the Navy's new build and charter program, made very large contributions to the Finance Committee To Re-Elect the President after April 7, 1972. Can you verify that?

Mr. BOWERS. No, sir, I have no information in that regard.

Chairman PROXMIRE. Do you know how much, if anything was contributed?

Mr. BOWERS. No, sir.

## MORE ON BUILD AND CHARTER—ROLE OF THE COMMITTEE TO RE-ELECT AND CONGRESSIONAL SECURITY

Chairman PROXMIRE. Do you know whether anyone from the Committee To Re-Elect the President or the White House talked with the Navy officials while the build and charter negotiations were underway?

Mr. BOWERS. I had some discussions.

Chairman PROXMIRE. I understand you talked with members of the staff prior to entering into the lease and did not talk with Members of Congress, is that correct?

Mr. BOWERS. We talked over a period of a couple of years in developing the concept. We discussed it with various staff members. This helped form the plan. Actually, it was refined as we went along and the plan, as you see it, was the result of working with the congressional staff experts. We are very pleased with the results.

Chairman PROXMIRE. Would you object to a requirement that build and charter agreements in the future be approved by Congress, that there be an authorization and appropriation on a case-by-case basis?

Mr. BOWERS. Sir, I think I mentioned in my opening statement that we were introducing legislation in this regard. This is in response to the GAO.

Chairman PROXMIRE. I know you are asking that legislation be introduced by some Member of Congress. But that does not respond directly to my question, should there be an authorization and appropriation on a case-by-case basis?

Mr. BOWERS. I am not familiar with the legislation, and I would like to study it before I respond completely. We want Congress, per GAO's suggestion, to have a full voice in this. But exactly how this will be accomplished will be a matter of careful study between us.

Chairman PROXMIRE. If it is a procurement it should be authorized and appropriated, because that is the formal process. Why not in this case? You are releasing tens of millions of dollars a year.

Mr. BOWERS. In this case, of course, what we are doing is entering into an agreement by which we spend money over a long period of time. The authorization, of course, would have to be for that full term of the agreement that we are entering into.

#### BUILD AND CHARTER—BACKDOOR FINANCING

Chairman PROXMIRE. What is happening, you are spending hundreds of millions of dollars of the taxpayer's money without any congressional approval, it is a back door financing, really.

Mr. BOWERS. I certainly would not want to use those words. There is no attempt to go in any back door. But I agree with you that the build and charter concept should be a matter of full disclosure and approval by the Congress. I think that is sufficient.

#### UNLEASH GORDON RULE—NAVY LAGS BEHIND IN USING SHOULD-COST

Chairman PROXMIRE. Mr. Mendolia, GAO reported that the Navy has made the least progress—and I should ask Mr. Bowers too, to comment on this—in using should-cost studies. In fact, they said the Army and the Air Force had both proceeded, they thought, rather well, but the Navy had been far behind. And yet, you have one of the Government's best should-cost experts, Gordon Rule, in the Navy. Why has the Navy been dragging its feet? Why not unleash Gordon Rule and let him do some real should-cost studies as he did with the TF-30? Or are you afraid of what he would find?

Mr. BOWERS. As I said before, I think that we have a semantics problem. Should-cost has become a buzz word. It means a very ag-

gressive attempt to arrive at a proper negotiated price and provide support for that price. We feel that in every contract we enter into we perform some type of should-cost effort.

Chairman PROXMIRE. We are talking about the classical should-cost approach such as in the TF-30.

Mr. BOWERS. There will be, of course, as I stated in my opening statement, occasions where perhaps competition is inadequate to reduce costs and control them, where we may feel that to gain the necessary insight into the situation, we must conduct one of the classic should-cost studies. I believe you have already had testimony to the effect that they are usually very expensive, and, therefore, you do not conduct them until you really have no other recourse.

Chairman PROXMIRE. They do not have to be expensive. The best were very inexpensive.

Mr. BOWERS. I agree. What you are saying is that rather than the large classic type of should-cost study, that we should conduct smaller ones.

Chairman PROXMIRE. What I am referring to is the fact—the testimony yesterday from Mr. Fitzgerald was that the best studies made some years ago cost relatively a small fraction of what the present studies did, and had much more bite in determining what a system can cost. And furthermore, these can apply where you do have an element of competition. With the C-5A we had competition, for instance, between three aircraft manufacturing firms. Lockheed was the successful bidder on that. But the trouble was that it was a buy-in. And a should-cost study there would have exposed that, perhaps. At least, it would have given the basis to have much better evaluation of the fact that the bid was lower than it possibly could be. So that the should-cost would not be confined simply to a situation where you do not have competition, but it seems to me that it can be used very effectively where you do.

Mr. BOWERS. I think that you have to use it carefully, however, or it will increase the total cost.

Chairman PROXMIRE. What I am talking about is whether or not you could assign a man like Gordon Rule, and give him a team and let him go ahead and make some should-cost studies here that could have a profound effect?

Mr. BOWERS. I agree that we must consider doing more should-cost work, and I have so instructed the Navy. However, I want to make sure that everyone understands what kind of studies we are doing. I agree that they should be smaller and less comprehensive, and hence, less expensive.

#### DOD REACTION TO A. E. FITZGERALD'S VIEW THAT SHOULD-COST TECHNOLOGY HAS BEEN DILUTED

Chairman PROXMIRE. Would you take a look at the testimony that Fitzgerald gave us yesterday, you and your top officials, and give us your reaction to it? Because he criticized the generalized diffusion of the should-cost technology. As you said properly, the semantic deterioration of the concept of a should-cost, it meant something a few years ago, and it is meaningless as time goes on, it is something that we should get back to the hard basis of what a system actually should cost, to the extent to which we can apply that.

I would appreciate it very much if you would give us your reaction to it.

Mr. BOWERS. Yes, I would be happy to.

Chairman PROXMIRE. Mr. Mendolia, will you give us your reaction on these should-cost problems?

Mr. MENDOLIA. Just general views, supplemental to Mr. Bowers?

Chairman PROXMIRE. No, to the Fitzgerald testimony. I am talking about for the record.

Mr. MENDOLIA. Sure. I would be delighted.

[The following comments were subsequently supplied for the record:]

COMMENTS OF HON. JACK L. BOWERS ON THE TESTIMONY OF A. E. FITZGERALD BEFORE THE SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT, NOVEMBER 15, 1973

The Navy agrees with Mr. Fitzgerald's observation that should cost studies ought to be oriented toward a quick, incisive, quantitative assessment of what would constitute a reasonable price for a given contract under efficient conditions. There are several reasons underlying this view. First, the cost of conducting should cost studies can be considerable and resources of the necessary caliber are limited, so the efforts should be aimed at securing a prompt payoff through improved pricing on an instant contract. Second, if the momentum toward savings generated by the study is to be maintained, the study recommendations should be specific and amenable to prompt implementation. Otherwise the concept will fall into disrepute for lack of demonstrated results. Finally, the Navy considers that the contractor's efficiency is primarily his responsibility. This is particularly true of the general, qualitative aspects of his operation. These may be of interest to the Government as a matter of overall efficiency, but the Navy agrees with Mr. Fitzgerald that they offer less potential for significant hard savings.

As Senator Proxmire pointed out during Mr. Fitzgerald's testimony, the measurement of savings generated by should cost studies is difficult at best. The difference between the contractor's initial proposal and the later negotiated price is not considered to be a reliable indicator because initial offers, particularly in a non-competitive environment, are made with the expectation that there will be reductions during negotiations. Accordingly, some of that difference will be achieved even where no should cost study is involved. Additionally, where contract types other than firm-fixed-price are involved, the actual cost to the Government may differ from the target or estimated cost negotiated.

The standard labor hour comparisons made by Mr. Fitzgerald are difficult to analyze based on the limited information presented. This approach might be useful as a gross index of efficiency in instances where firms are known to have comparable accounting systems. However, accounting systems tend to vary considerably, and therefore, its use would be severely limited.

The method, suggested by Mr. Fitzgerald, of analyzing each discrete element of the cost breakdown provided with the contractor's proposal is followed in the Navy's Business Clearance procedure. In most cases, this analysis can be done adequately without a formal should cost study through comparisons with other contractors of such things as labor hour content for similar items, projected improvement curves, the degree of competition in subcontracting, and overhead rates. This is the type of analysis that is characterized as a "mini should cost." This process also serves to identify unfavorable trends in efficiency which may indicate the need for a full should cost study.

COMMENTS OF HON. A. I. MENDOLIA ON THE TESTIMONY OF A. E. FITZGERALD BEFORE THE SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT, NOVEMBER 15, 1973

DOD generally agrees with the thrust of the Fitzgerald Testimony in so far as he favors use of the Should Cost concept to achieve sounder pricing. Each of the Military Services has positive programs for using the Should Cost concept whenever feasible. Consideration of Should Cost concepts is always present in our contract pricing—whether competitive or negotiated. Should Cost techniques, however, have far less applicability when price competition exists. We favor competition as the best method of insuring a reasonable price is paid. Recent

testimony before the Subcommittee bears out that we have stressed competition as the preferred method of purchasing.

Mr. Fitzgerald's testimony regarding the development of a "Standard Labor Hour Index" is a new concept which to the best of our knowledge has never been used in DOD. It was recommended by Performance Technology Corporation (PTC), with whom Mr. Fitzgerald was formerly associated, under a contract with the Army. Unfortunately, the recommendation has only recently come to our attention. While it is worthy of consideration, use of the technique requires considerable further research and consideration before it can be adopted. It is not a simplistic computational technique as presented by PTC and would require considerable training and refinement to employ. Nevertheless, we feel that the concept of developing indices which would focus our limited resources into areas with the greatest potential for improvement has merit. However, development of such a technique is costly and time consuming.

The testimony makes a point of DOD's refusal to divulge proprietary contractor data. We take this position for several reasons. First, contractors must maintain the ability to preserve the confidential nature of their unique production methods and management techniques. It is this unique difference among contractors that provides the basis for increasing competition in the future. The very heart of our Should Cost efforts develops just such proprietary data that would be of immense value to the competitors of the company studied. Second, to display for all to see, the proprietary data of firms tends to destroy our credibility and tends to destroy our cooperative basis for conducting future Should Cost studies. Failure to achieve some reasonable degree of cooperation from the firm being reviewed does not produce the most desirable results. Third, we are prohibited by law (18 USC 1905) from divulging contractor proprietary data.

We have cooperated with the Comptroller General in his efforts to assess the work we are doing in the Should Cost area. This we will continue to do. The GAO has now examined the work done by all of the Military Services and we believe was convinced that the Should Cost efforts performed have improved our activities. The GAO made some general recommendations concerning long range goals which we have accepted. We are of the opinion that this is the best technique for Congress to use to be assured we are doing our best.

Chairman PROXMIRE. Gentlemen, thank you very, very much. You have been responsive and helpful, and I do appreciate it. I do not mean to indicate by my questions that I am an adversary toward you or toward the Defense Department or toward the Navy. As I said at the beginning, I think we ought to have the strongest military force in the world, and I hope I can contribute in helping us get it.

The subcommittee stands adjourned.

[Whereupon, at 12:20 p.m., the subcommittee adjourned, subject to the call of the Chair.]

[The following information was subsequently supplied for the record:]

MARCH 13, 1974.

Senator WILLIAM PROXMIRE,  
*Chairman, Subcommittee on Priorities and Economy in Government, Joint Economic Committee, Washington, D.C.*

DEAR MR. CHAIRMAN: Thank you for the opportunity to respond to the comments of Assistant Secretary Bowers, Assistant Secretary Mendolia, and Comptroller General Staats on my testimony of November 15, 1973.

Secretary Bowers' comments are generally constructive and well-taken points. His stated should-cost emphasis on obtaining hard, quantified savings on an instant contract is exactly what is needed to counter the strong, continuing pressures for greater emphasis on fuzzy, drawout qualitative reviews.

However, I am somewhat puzzled by his comments about the need for "comparable accounting systems" in order to use the simplified partial price index<sup>1</sup> I proposed. The output part of the index calculation, the measured amount of work produced by conversion labor on the contract, is independent of actual cost

<sup>1</sup> I use the term, "partial price index," because the index does cover the full scope of cost elements envisioned in Recommendation No. 4 of the Joint Economic Committee report, *The Economics of Military Procurement*, May 1969.

accumulation and would not be affected by accounting systems variations. The input part of the calculation, effectively the total in-house contract price, is arrived at by process of elimination. The total derived in-house contractor price is the remainder of total contract price less "out-house" charges. Here again, different methods of accounting for in-house costs make little or no difference so long as the total contract price is arrived at logically and accurately. Because it was an attempt to cope with concealment of cost and pricing data, the simplified index has many shortcomings, but sensitivity to accounting classifications is not one of them.

Secretary Mendolia's interest in the use of work measurement-based indices is gratifying. However, the approach is far from "a new concept" as he describes it. The concept was used by Frederick Winslow Taylor in starting the industrial productivity revolution in 1886. More on point, the Air Force Logistics Command has used a similar approach for about 20 years in its own depots, and today uses a dollars per standard labor-hour \$(/SLH) index similar to those discussed in my testimony. The concept seems new only because the use of work measurement to quantify cost and to track productivity has been so completely suppressed in big-time military procurement.

Secretary Mendolia states that development of the suggested indices will be costly and time-consuming. This fact has been demonstrated successfully many times, usually to the embarrassment of the big spenders in the procurement community. If development does turn out to be costly and time consuming, the cause will be the professional destruction of people formerly involved in similar activities who could do the work quickly and with a sure hand. Even those former practitioners of this approach who are still around are specifically excluded from the major military acquisition business. In light of this, it is the height of sophistry to invoke the need to "research" the problem or lack of capability as excuses for inaction. I sincerely hope Secretary Mendolia will reject all such arguments by defenders of past poor practices.

Secretary Mendolia also comments on his refusal to disclose cost and pricing data, which he calls "proprietary contractor data", to the Joint Economic Committee. First, he cites the contractors' need "to preserve the confidential nature of their unique production methods and management techniques."

During the nearly four years I consulted with the Joint Economic Committee, I cannot recall a request for disclosure of "unique production methods and management techniques." The Committee studies I was involved with were focused on the care and feeding of huge contractors and how to keep them from eating us out of house and home. (The lesson learned most emphatically is that cover-up is no solution.) Most of the specific programs we tried to dig into turned out to be calamities. Secretary Mendolia's fears conjure up visions of predatory competitors lying in wait to steal management secrets that led to these stupendous cost overruns and resounding technical flops. Whatever "unique production methods and management techniques" might have been used to produce these disasters could only be wished on our worst enemies. Why anyone would want to steal such "secrets" is hard to fathom.

If Secretary Mendolia is seriously concerned with shielding contractor data from potential competitors, he must turn his attention elsewhere. It is idle to suppose that the giant systems and hardware contractors are counting on releases through the Joint Economic Committee for information about other contractors. The giants either have other companies' cost and pricing data in negotiating contracts with one another and with the lesser fry. Many contractors also impose in-plant surveillance on their subcontractors. In my experience, both price justification and visibility requirements among contractors are often more penetrating than between the Government and giant contractors. In addition, many contractors swap management information, including data used in costing and pricing, through industry and management associations. Cost and pricing data is also widely available to Department of Defense procurement officials. Contractors wishing to benefit from this knowledge need only to hire some of the thousands of individuals who move with great ease and frequency between the DOD procurement establishment and their suppliers.

Then Secretary Mendolia's commentary states that he is "prohibited by law (18 USC 1905) from divulging contractor proprietary data." 18 USC 1905 forbids divulging certain information from private sources in any manner or extent "not authorized by law" (emphasis added).

Congress, through its agent the General Accounting Office, is authorized by law to have access to and to examine any pertinent books, documents, papers and

records of contractors and subcontractors on negotiated contracts. Contractors seeking to negotiate contracts are required to submit cost and pricing data which become part of the pertinent records. Just to make sure there would be no misunderstanding about the right of Congress' GAO arm to have access to such records, Congress passed a law (P.L. 245) requiring negotiated contracts to include a clause giving the Comptroller General or his representatives the right to this sort of information. Thus, the right of access is not only "authorized by law," but is also agreed to in advance by parties to negotiated contracts.

I questioned Mr. Charles Jarrett, Secretary Mendolia's spokesman in these matters, on this point. He said GAO could get cost and pricing data from the Department of Defense if they wanted it. So could the Armed Services and Appropriations Committees of the Congress, if they were interested. Mr. Jarrett said the Congressional government operations committees could probably get the data, too, although I sensed considerable uncertainty here. He acknowledged that cost and pricing data is available to military and civilian procurement officials, including many who may subsequently go to work for contractors.

Mr. Jarrett justified this selective interpretation of the law by explaining that it was widely believed that the Chairman of this Subcommittee would make public the cost and pricing figures if he got them. Mr. Jarrett viewed this possibility as a very serious matter. In fact, he stated that the Department of Defense would be "compounding a felony" by releasing cost data to the Chairman of this Subcommittee.

At least an implicit understanding among those privileged to see cost and pricing data is a necessity in Mr. Jarrett's rationalization. Such an understanding would have to include what amounts to a cover-up to keep the taxpayers in the dark. Other major interest groups concerned with the process already know the facts or can get them if they desire. Personally, I find it difficult to believe that the chairman of the armed services and appropriations committees would knowingly agree to such a cover-up.

Mr. Jarrett's reference to possible felonies in connection with this subcommittee's obtaining cost and pricing data is also disturbing. Mr. Jarrett was not clear who the felons would be in such cases, but any suspected miscreants could almost certainly be tracked down if the full resources of the Government were brought to bear. The fact that the Joint Economic Committee has received cost and pricing data on occasion is well known. If any Government officials are sincere in believing that violation of the "Not Releasable to Proxmire" rule is a felony, they have a clear duty. They should refer the matter to the Justice Department for investigation and, if appropriate, prosecutions. On the other hand, if the felony school is not serious in their contention, they need a fresh argument.

Secretary Mendolia concludes his comments on my testimony by citing the Department of Defense's cooperation with the Comptroller General in the should-cost area. This sheds some light on the Comptroller General's denial of GAO pressure to convert should-cost from its original quantitative emphasis to the present qualitative, procedural emphasis. Work measurement is the heart of the original should-cost approach, but with the GAO's tutelage over the last five years, the top procurement people in the DOD now find the most fundamental aspects of work measurement a "new concept."

Privately, procurement specialists in DOD agree with me that the version of should-cost pushed by GAO is an outgrowth of the Air Force's Industrial Management Assistance Surveys (IMAS), which were primarily plant-wide procedural reviews. Fragments of quantitative assessment would crop up in these reviews, but there was no systematic analysis, deflation and reassembly of *contract* cost elements.

With the IMAS approach dominating the GAO's thinking, it is little wonder that the Comptroller General pleads inability to quantify should-cost findings and savings. The purpose of the original approach endorsed by the Joint Economic Committee in May of 1969 was quantification of savings potential.<sup>2</sup> To say that avoidable fat in a contract could not be quantified would be to say that a should-cost study had not been done. The Comptroller General's comments lead me to suspect that the concept of using work measurement to quantify fat in contracts may be as novel to him as it was to the DOD experts.

<sup>2</sup> See previously referenced May 1969 report, especially pp. 13-15. Pertinent sections of the report are included as an attachment to this letter.

GAO should-cost reviewers have stubbornly resisted the quantitative approach. Separately and together, Joint Economic Committee staff members and I have discussed the matter with them many times, trying to convince them to gather the simple facts needed and offering to help if they desired. After nearly five years of no progress in this direction, I believe any reasonable person would agree that GAO rejection of the quantitative approach is total for practical purposes.

Meanwhile, the GAO has applied steady pressure to increase emphasis on procedural reviews. For example, the GAO criticized the Army should-cost program, then strongly oriented toward quantitative challenge of contract prices: "... GAO believes the benefits from the should-cost studies can be increased substantially by placing greater emphasis on analyzing contractors' manufacturing processes and practices to identify specific actions to improve efficiency and economy."<sup>3</sup> [Emphasis added.]

Pressed for an example of recommendations the GAO wanted to see in the should-cost studies, GAO specialists cited for me one of their own reviews which had recommended that the contractor improve his production control system. A gross, plant-wide estimate of possible savings was attached to this recommendation, but the GAO specialists stated that it would be impossible to quantify the impact, if any, on any contract proposal then in hand.

Even in his letter denying GAO pressure to emphasize procedural aspects, the Comptroller General states that the GAO had urged the DOD should cost teams to "... place greater emphasis on contractors' operations..." (emphasis added.) In general, the pressure campaign for this shift of emphasis has been so successful that the original should-cost charge "to determine the amount (my emphasis) that weapon systems or products ought to cost"<sup>4</sup> has been almost lost from view. This is a major victory for defenders of programmed excessive costs and a setback for our taxpayers.

As Secretary Bowers commented, general and qualitative aspects of a contractor's operations may be of interest to the Government, but the focus of the should-cost effort should be on hard savings on an instant contract. The Government team's primary responsibility should be to determine what a particular contract should cost. How that cost is attained, or even whether it is attained on fixed price contracts, is primarily the responsibility of the contractor.

Once tough but attainable contract prices are negotiated and the willingness to enforce them is demonstrated, contractors might be more receptive to helpful hints for better management systems, and might even generate significant improvements on their own initiative.

In summary, I perceived faint glimmers of hope in the DOD comments on my testimony. Even on the issue of release of negotiated contract cost and pricing data, it seems probable that the problem would evaporate if the Comptroller General would direct the GAO to get the needed facts. I believe he would do this if he detected significant, outspoken Congressional dissatisfaction with the GAO's reluctant approach and vague reports on matters embarrassing to big contractors, such as quantification of contract fat. However, until that message is conveyed, should-cost, measurement-based price indices and other aids potentially valuable to the taxpayers are probably lost causes, at least insofar as the work of this Subcommittee is concerned.

A. E. FITZGERALD.

Attachment.

[Excerpts from "The Economics of Military Procurement," report of the Subcommittee on Economy in Government of the Joint Economic Committee, Congress of the United States, May 1969, pp. 13, 14, and 15]

#### 10. THE CONCEPTUAL PROBLEMS IN USING HISTORICAL COST ANALYSIS AND THE FAILURE TO USE "SHOULD COSTING"

The analysis of cost and pricing data is a crucial factor in determining the amount the Government spends on weapons programs. Without good cost analysis and cost estimation, the Government is unable to control the costs of procurement, much of which is based on original estimates. That is, the price of a contract is negotiated on the basis of cost estimates submitted by the contractor. An inflated estimate can result in an inflated price unless DOD can properly

<sup>3</sup> Assessment of Army Should-Cost Studies, United States General Accounting Office, October 30, 1972.

<sup>4</sup> JEC Report, May 1969, p. 14.

evaluate estimated cost data. Yet, as indicated above, the Defense Department's ability to adequately analyze cost data is severely limited by the lack of information on profitability, the absence of data on subcontracting, the shortcomings of the Truth-in-Negotiations Act, and the nonexistence of uniform accounting standards.

Another obstacle to adequate analysis is the fact that cost estimation presently relies extensively on past experience; that is, historical costs are used to provide estimates of the future costs of proposed weapons systems. Historical costs refer to the actual costs of performing earlier contracts. They are often insufficient and misleading guides to estimating the costs of new contracts for several reasons. For example, it is possible for the cost of performing a contract to be inflated intentionally or through contractor inefficiency, and for the costs of that contract to influence the estimation of costs on subsequent contracts.

As the testimony showed, historical costs are no better than the underlying data on which they are based. If the costs of previous procurements were obtained without competition, estimates based on them probably would not be comparable to costs determined competitively. As we know, most procurements in the DOD data bank were not awarded competitively. In fact, many of the earlier contracts were the CPFF type in which some of the most extreme cases of cost overruns occurred.

The use of historical costs may give the contractor a premium to inflate his cost base. The inflated costs of previous contracts may then become the new cost base figure for subsequent production runs and subsequent contracts. If profit is calculated by DOD as a percentage of costs, the contractor may be given a profit motive to increase costs. The only party hurt in this scheme is the American taxpayer.

Implicit in the criticism of historical cost is the point that the cost of a particular contract may have been excessive because of contractor inefficiency. The possibility that contractor inefficiency may be a significant problem was brought out in the testimony of Colonel Buesking (U.S. Air Force, retired) and A. E. Fitzgerald, Deputy for Management Systems, Office of the Assistant Secretary of the Air Force. Both witnesses compared the probable cost approach, which employs historical costs, and the should-cost approach to Government estimates.

The should-cost approach attempts to determine the amount that weapons systems or products *ought* to cost given attainable efficiency and economy of operation. The method of determining the should-cost figure is based on a combination of industrial engineering and financial management principles. Briefly, a study is made at a contractor's plant of each of the cost elements of the contractor's operation to ascertain what the product should cost the Government, assuming reasonable efficiency and economy on the part of the contractor. Obviously, this approach differs sharply from the traditional one in which costs are estimated in advance on the basis of earlier costs, and in which the Government thereafter reimburses the contractor for incurred and allocable costs without finding out whether the costs were reasonable.

According to the testimony, when the should-cost approach was employed by the Navy in connection with the TF-30 engine contract for the F-111 program, substantial inefficiencies were detected in the contractor's plant. As a result of the study, the contract price was later reduced by more than \$100 million.

It is difficult to see how the Government can be assured that incurred costs will be reasonable on negotiated contracts without the benefit of a should-cost type in-depth study and evaluation. Col. A. W. Buesking (U.S. Air Force, retired) testified that selected evaluations of resource planning and control systems conducted to assess contractor's capability to meet standards of efficiency revealed that control systems essential to prevent excessive costs were absent. He estimated that costs in such plants are 30 to 50 percent in excess of what they might be under competitive conditions. When Admiral Rickover was asked to comment on Colonel Buesking's statement, he said, "His estimate is a conservative one." Establishing objective cost performance standards would be an important step toward cost control.

