THE ACQUISITION OF WEAPONS SYSTEMS

HEARINGS

BEFORE THE

SUBCOMMITTEE ON ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE

CONGRESS OF THE UNITED STATES

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CONTENTS

WITNESSES AND STATEMENTS

MONDAY, DECEMBER 29, 1969

TUESDAY, DECEMBER 30, 1969

WEDNESDAY, DECEMBER 31, 1969

SUBMISSIONS

MONDAY, DECEMBER 29, 1969

Appendix

TUESDAY, DECEMBER 30, 1969

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MONDAY, DECEMBER 29, 1969

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

The Subcommittee on Economy in Government met, pursuant to notice, at 10 a.m., in room G-308, New Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard Kaufman, economist, and Douglas C. Frechtling, economist for the minority.

OPENING STATEMENT BY THE CHAIRMAN

Chairman PROXMIRE. The Subcommittee on Economy in Government will come to order.

Today the Subcommittee on Economy in Government of the Joint Economic Committee begins a new round of hearings designed to probe into the policies and practices surrounding military contracts and the purchasing of weapons, other hardware, and goods and services.

The year 1969 has been characterized as the "year of the cost overrun." This is not entirely the case, and it would be more accurate to call 1969 the year that Congress and the American taxpayer found out about cost overruns in military procurement.

In my judgment, the work of this subcommittee over the past several years has been, to a very large extent, responsible for our newfound knowledge about the way weapons systems are purchased and about the problems surrounding their acquisition by the military, problems of poor performance and late delivery as well as cost overruns.

A Pentagon directive has recently ordered purged from the military lexicon the phrase "cost overruns." Instead "cost growth" is to be used. Mr. Keller, I notice in your statement this morning that you follow the proposals of the Defense Department and use cost growth instead of cost overrun. As I understand it, you are the agent of the Congress, and you can use any term you and Mr. Staats decide is appropriate but in my view a cost overrun is a perfectly good and clear term, and I think that the reason the Pentagon doesn't like it used is because it does reflect there is a poor estimate on their part or inefficiency, some degree of inefficiency implied. They shouldn't get away with shuffling the semantic cards in this way. It reminds me

of the story of how Lewis Carroll, in "Alice in Wonderland," had Humpty Dumpty say that "Words are exactly what I intend them to be, neither more nor less." Who is to be master is what counts. And in this case the Pentagon is master. I think that is what is at stake here.

Let me say, no rewriting of the English language can cure the defects inherent in military procurement, and it would be more gratifying to learn that the Pentagon intended to control the costs of weapons as much as it hopes to control the use of words. Changing the vocabulary of waste and mismanagement cannot solve those problems.

The challenge we face today is precisely that: How to solve the problems of waste and mismanagement and the consequent excessive military spending. How much does the present system of contracting-out need to be altered? How far do we have to go in order to gain full control over military spending?

Earlier this year, the subcommittee, in its report on "The Economics of Military Procurement," made a series of recommendations. Most of them are in various stages of implementation. For example, we recommended that the GAO conduct a comprehensive study of defense profits. No such study has ever been conducted, and it is scandalous that the Government which spends so much of the taxpayers' money on military hardware cannot properly account to the taxpayer for the use of his money. The taxpayer is entitled to know whether excess profits are being taken on military contracts, and the Congress needs to know what the level of profitability is in this area—whether too high or too low.

Congress enacted a statutory requirement for a profitability study this year which the GAO has begun to carry out. I hope to discuss this study today and I notice you do, Mr. Keller, in your statement.

For another example, we recommended in our report what amounts to an information system for the Congress on weapons systems contracts. One of the most serious shortcomings of congressional and public scrutiny over military spending is the fact that there is not good knowledge about the costs, performance, and status of individual weapons programs. Some of these programs cost hundreds of millions and billions of dollars.

It is essential that every Member of Congress have access to the costs of these programs so that he may be able to report to his constituents on their status, and so that timely action may be taken in the legislative branch when problems become apparent. The GAO, I am glad to say, has begun to compile the materials which would comprise such an information system, and this matter, along with several others, will also be discussed today.

I would like to point out that this hearing represents the first inquiry into the acquisition of weapons systems since the great military debate of 1969. Throughout the year, those of us in Congress concerned over excessive military spending have urged upon the General Accounting Office an enlarged and more aggressive role in this area. As you recall this was a very important part of the long debate we had last summer, the most significant debate in the view of many of us that Congress had in 1969. And this is the first time I think you have reported on procurement since that debate took place and since Congress took some action to provide the GAO would make more compre-

hensive reports. We have made strong recommendations that the Pentagon be more candid and provide more facts to the Congress.

No agency has a greater impact on the national economy than the Department of Defense. No source of Government funds has fed the fires of inflation as much as military expenditures.

We frankly look forward to greater assistance in the gathering and analysis of facts about defense spending from the GAO, and we hope for better cooperation from the Pentagon.

Now, Mr. Keller, before I come to you, I do want to make one other statement because there has been an unfortunate misunderstanding, I think, on this subcommittee about the appearance of Attorney General John Mitchell before this subcommittee with regard to Mr. Fitzgerald.

I am sorry to report that Attorney General John Mitchell has declined my invitation to him to appear as a witness tomorrow afternoon. The appearance of the Attorney General will be rescheduled, however. Because my invitation to him has stirred up some controversy within this subcommittee, I want to clarify the facts in this regard.

In mid-November, we held hearings into the firing of A. Ernest Fitzgerald, the efficiency expert who lost his job because he performed it too well. As I recall, the announcement that he would be fired was made in early November, I think about November 3. On November 22 in a press conference I announced my personal request that the Attorney General investigate the Fitzgerald firing for possible criminal violations of law. I also announced on November 22 that if I was not satisfied that action had been taken on my request, I would ask the Attorney General to testify and make a progress report to the subcommittee during the last 3 days of December, while the present hearings were in progress.

Now, this was a public statement, it was public knowledge, it was well known a month ago that we were going to ask the Attorney General to come up in the last 3 days in December and it was essential that we ask him to come up then because Mr. Fitzgerald is to be separated from the Federal service in the first 3 or 4 days of January, and this was the last opportunity before he actually left the service that we could have the Attorney General appear and report on his investigation on what would appear to us to be a prima facie violation of the law, intimidation of a congressional witness.

By letter dated November 28, I received an acknowledgement from Assistant Attorney General Wil Wilson, stating, and I quote, this was November 26. "That after the transcript has been reviewed, a determination will be made as to whether the evidence present shows a basis for further action by this Department."

In other words, all they had to do before they made a preliminary report to us in the last 3 days of December was to read the transcript. I don't know if they need a course in rapid reading down there at the Department of Justice but they had a month in which to read this transcript. I think it could have been read in a few hours. At any rate Mr. Wilson thanked us for sending over the transcript of the hearings. That was the last word I received from the Justice Department on this matter. Because Mr. Fitzgerald is scheduled to leave his job at the Pentagon on January 5th, I thought it important to get some action out of the Justice Department prior to that time. Therefore, on Decem-

ber 20th, I sent a letter to Mr. Mitchell asking him to testify. We sent letters to the ranking members of the subcommittee, ranking minority members, at the same time we sent the letter to Mr. Mitchell. Nevertheless, some members of the minority have written letters which very strongly oppose our scheduling Mr. Mitchell at this time although, as I say, it was known well in advance we had to have him now because of the imminence of Mr. Fitzgerald's departure.

The Attorney General has informed us that he will not testify because the investigation is very much underway and it would be inappropriate for him to comment on it at this time.

As I said, Mr. Mitchell's appearance will be rescheduled for the near future. Unfortunately by the time he comes, Mr. Fitzgerald will be out of a job, and the Justice Department, at best, will be locking the barn after the horse has been stolen.

Nevertheless, I intend to pursue this matter and to find out whether there is law and order in the Department of Defense, as well as for the other citizens in this country.

Our witness this morning is Robert F. Keller, Assistant Comptroller General of the United States. Mr. Keller was formerly General Counsel of the GAO and was appointed to his position this year. Mr. Keller, will you please introduce each of the members of your staff who are with you today and then proceed in any way you wish?

STATEMENT OF ROBERT F. KELLER, ASSISTANT COMPTROLLER GENERAL OF THE UNITED STATES; ACCOMPANIED BY CHARLES M. BAILEY, DIRECTOR, DEFENSE DIVISION; HASSELL B. BELL, ASSOCIATE DIRECTOR; JAMES H. HAMMOND, ASSOCIATE DIRECTOR; HAROLD H. RUBIN, ASSOCIATE DIRECTOR; AND WERNER GROSSHANS, ASSISTANT REGIONAL MANAGER, SAN FRANCISCO OFFICE

Mr. KELLER. Thank you, Mr. Chairman.

Beginning on my far right is Mr. Harold H. Rubin, who is an Associate Director of our Defense Division in charge of research and development; Mr. James Hammond, who is an Associate Director of our Defense Division in charge of procurement; Mr. Charles Bailey, Director of our Defense Division; Mr. Hassell Bell, an Associate Director of our Defense Division who is in charge of our work on weapons acquisition; and Mr. Werner Grosshans, Assistant Regional Manager of our San Francisco office, who has been spearheading our "should cost" study.

I have asked these gentlemen to be with me this morning because your inquiry is quite broad and they will be able to fill in the details which I may not be familiar with in certain cases.

If you would like, Mr. Chairman, I will proceed with my statement.

Chairman PROXMIRE. Before you do I would just like to say I think this is one of the best statements from the General Accounting Office, probably the best, I have seen in the years I have been on this subcommittee.

Mr. KELLER. Thank you, Mr. Chairman.

Chairman PROXMIRE. I think it is excellent and I think it is an indication that you have risen to the challenge that this Congress has given to this great agency of yours in the determination on the procurement bill during this past year. It is a fine report and one I think that will be most helpful to us in doing a far better job in holding down waste in defense spending.

Mr. KELLER. Thank you, Mr. Chairman, very much. We certainly are aware of the importance of the subject matters that this subcommittee has been going into and we intend to make every effort to make your job easier and Congress' job easier.

First, let me say we appreciate the invitation to appear here this morning. In your letter to us dated November 10 you stated that you would like for us to particularly cover the status of our work in connection with major weapons acquisitions and the "should cost" concept of estimating contractor costs.

You also expressed an interest in the progress being made in implemenation of the Truth in Negotiations Act, and requested figures and comments on competitive and negotiated awards, as well as information on percentage of prime contracts awarded to small business; and improvements, if any, in the gathering of statistical information by the Department of Defense on subcontracts.

SELECTIVE ACQUISITIONS REPORT (SAR)

If I may, Mr. Chairman, I would like to begin with the work we are doing on major systems acquisitions.

Because of the increasing significance and magnitude of major systems acquisitions by the Department of Defense and congressional concern, which you so well pointed out a few minutes ago, over contract performance and cost growth, we established a separate group in July 1969, within our defense division, to place more emphasis on problems associated with the acquisition of major systems.

For our purposes, we have defined major acquisitions as being weapon systems and/or major acquisitions related to weaponry, for example, aircraft; missiles; boosters; combat, tactical, and support vehicles; ships; submarines; communications systems; space systems; and other acquisitions whose costs are expected to exceed $25 million for R.D.T. & E. or $100 million for production.

Our initial efforts have been planned to enable us to furnish the Congress in January 1970, and we expect to meet that date, with an overall report dealing with DOD's selected acquisition reporting system as it relates to the cost, schedule and performance experiences of some 50-odd major systems.[1] Reports on the individual systems, practically all of which are classified, are being prepared and will be made available to the Congress.

CLASSIFICATION PROBLEM

Work on this assignment commenced in August 1969 and is nearing completion. We will supplement our overall report with reports on individual weapons systems, which at this point, Mr. Chairman, we expect will have to be classified.

[1] GAO Report No. B-163058, "Status of the Acquisition of Selected Major Weapon Systems" (Feb. 6. 1970), may be found on p. 75.

Chairman PROXMIRE. Why do they have to be classified?

Mr. KELLER. The classification, of course, is determined by the Department of Defense. The primary reason for classification of individual reports is that they deal with specifications and numbers. There is no classification on dollars, but when you deal with specifications and numbers there is a problem.

Chairman PROXMIRE. But, as you say, as I understand it you say, the 50-odd major systems practically all are classified.

Mr. KELLER. That is my understanding.

Chairman PROXMIRE. Of course, this does greatly inhibit the Congress. It flatly prohibits the press or the public from knowing about this, and it inhibits the Congress because you know how we operate up here, unless something is in the newspapers, people in the Congress don't pay much attention to it.

Mr. KELLER. You do understand that our overall report will deal with dollars, delays, and slippages but when we get into numbers and specifications then we have a classification problem.

Chairman PROXMIRE. Well, I hope, I want to encourage you to work as hard as you can to eliminate any unnecessary classification.

Mr. KELLER. I am sure you understand that we cannot declassify.

Chairman PROXMIRE. I understand. And I have sympathy with the Defense Department. There are some of these things which have to be classified and should be. But I just hope that you press hard to make them justify any classification they have.

Mr. KELLER. We will do that, Mr. Chairman.

I wish to point out at this time that the scope of our initial work was necessarily limited and therefore our reports will only identify current problems with regard to the DOD's selected acquisition reporting system, which is commonly referred to as the SAR, and to reported cost, schedule and performance data without attempting to reach definite conclusions as to cause or possible remedies. Additional work will continue to more fully develop the underlying causes of problem areas identified and proposed solutions.

The Department of Defense, at our request, has prepared an inventory of all major systems being acquired by the military services. It is intended that this inventory will be up-dated periodically and will serve as a basis for future selection of systems in our on-going work in reviewing the SAR system. DOD's inventory includes some 130 systems, having an estimated total cost through completion of about $140 billion. Of this amount, about $85 billion has not been funded as yet. This excludes systems for which production is 90 percent or more complete.

INFORMATION ON SYSTEMS NOT AVAILABLE CENTRALLY

It is important to note that, as far as we know, information is not available centrally as to the total number of systems being acquired or their costs.

Chairman PROXMIRE. That sounds like a very shocking statement. You say information is not available centrally? You say it is not available? Does that mean it is not even available to the Secretary of Defense or the President of the United States,

Mr. KELLER. That is my understanding, it has to be accumulated. It is not available centrally in the Department of Defense.

Chairman PROXMIRE. Even in the Department of Defense. If it is not available centrally the Secretary of Defense does not really know, if I understand your statement here correctly——

Mr. KELLER. I think he can find out.

Chairman PROXMIRE (continuing). The total systems being acquired or their costs.

Mr. KELLER. The Secretary can find out but he would not have the information immediately at hand. Is that correct, Mr. Bell?

Mr. BELL. Yes, sir.

Mr. KELLER. Also, Mr. Chairman, the costs for these systems are essentially system hardware costs including research and development. Other related costs such as special facilities, training, logistics support, et cetera, associated with major systems are, of course, substantial.

Chairman PROXMIRE. Let me go back just a little bit here.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. You say it is available but it is not at hand? The Secretary of Defense does not have this information as to the total number of systems and their costs available to him?

What significance is there to the fact that he does not have this available, if any?

Mr. KELLER. I would think the significance would be for his own use for management purposes or for use of congressional committees.

Chairman PROXMIRE. Wouldn't it be logical that the Secretary of Defense should at least know whether these costs are increasing or decreasing?

Mr. KELLER. He may well know.

Chairman PROXMIRE. Isn't it logical he should know how many major weapons systems there are for which he may be responsible at all times?

Mr. KELLER. He may have means of knowing, we don't know, but we have found no central information available in the Department of Defense.

Of course, the SAR system will give him——

Chairman PROXMIRE. I don't want to be unfair to the Secretary of Defense. He is a man from my own State and I think he is a very able man.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. But I just want to be sure I don't miss something here that seems very significant. Why should not the Secretary of Defense know at all times how many major weapons systems there are, and what their costs are, and be able to follow that and have that centrally available to him constantly on a regular basis. Why wouldn't that be important to him in discharging his responsibilities. You say he doesn't have that now.

Mr. KELLER. I would think it would be. Now, the SAR systems——

Chairman PROXMIRE. You said what?

Mr. KELLER. I said I would think it would be important to him.

Chairman PROXMIRE. You would think it would be.

Mr. KELLER. Yes, sir, that is my personal view.

Chairman PROXMIRE. It is important for him to know what is happening in the Defense Department, is it not?

Mr. KELLER. That would be my own view, Mr. Chairman. I think the Secretary might speak for himself on it.

Chairman PROXMIRE. Well, this is something we would like to have any qualification on that you may have because I think the committee may consider the possibility of recommending the Secretary of Defense have this under his control and know what, how many major weapons systems he is responsible for, what their costs are, and know it on a day-by-day basis.

SAR WILL NOT INCLUDE ALL SYSTEMS

Mr. KELLER. Of course, I should explain that the SAR system was and is being developed to furnish this type of information, but it will not include all systems. The SAR system also only includes those with research and development over $25 million or more and production over $100 million.

Chairman PROXMIRE. That is going to be with the major systems.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. It would be important for him to have this fully available to help him consider tradeoffs. He has had to make painful decisions; he had to do so this year and is going to have to do so again next year. But unless he has these available on a day-by-day basis to know the costs, he is not in position to know the priorities, which systems should go ahead, which systems should be reconsidered, and which systems should not go ahead because of their costs, because of what is happening with their costs.

Mr. KELLER. Yes.

Chairman PROXMIRE. Go ahead.

Mr. KELLER. The SAR system was introduced by DOD in early 1968 and has been undergoing refinements since that time.

Chairman PROXMIRE. SAR is selected acquisition reporting.

PACKARD DIRECTIVE

Mr. KELLER. Yes. Recently the Deputy Secretary of Defense stated in a directive that it was "* * * the key recurring summary report from project managers and the military departments to inform the Secretary of Defense on the progress of their major acquisition programs." [1] The Deputy Secretary has also emphasized to the military services the need for personal involvement in the review and analysis of these reports at the secretarial level and by all levels of management necessary to insure that they fairly and accurately reflect the status of the programs being reported.

The SAR reports are prepared quarterly by the responsible military service, usually at the system program or project office. Reports are currently being prepared on 57 designated major systems acquisitions. All of these reports were not being prepared on a routine basis because for the purpose of our review DOD elected to propose one-time SAR's on those systems we selected for review which were not in the reporting system.

[1] Full text of the Packard memorandum may be found on p. 71.

SAR System Shortcomings

We have concluded from our review of the 57 major systems, that the SAR system, in concept, represents a meaningful management tool for measuring and tracking the progress of major acquisitions. However, as with any new reporting system, the SAR system has serious shortcomings and there are several areas where improvements are essential.

We found that the SAR is not sufficiently encompassing and therefore fails to disclose significant matters concerning the progress of major acquisitions. For instance:

NO COMPARISON OF TECHNICAL PERFORMANCE

No. 1. Although appraisals of certain specified technical features of the systems are required (weight, range, speed, accuracy, etc.) there is no comparison of the technical performance actually demonstrated with that required by the contract.

Chairman Proxmire. Why isn't that essential? Why shouldn't we absolutely have to have that if we are going to make any kind of appraisal of the way the program is proceeding?

Mr. Keller. We think it is essential, Mr. Chairman.

Chairman Proxmire. It seems to me that technical performance is as important as costs; you have to have it.

Mr. Keller. Let me put it another way. If you are not getting the performance you contracted for, then you have lost something.

Chairman Proxmire. If you run on target on costs, you are proceeding beautifully on target, this is supposed to cost $100 million at a certain stage and it is $100 million at a certain stage but you are deceiving yourself if you think you have any kind of a worthwhile reporting system if you don't know whether at that stage it is performing, I stress performing, in accordance with the schedule. If it is not performing, then that $100 million may be completely wasted even though the amount you are spending is the scheduled amount; isn't that right?

Mr. Keller. We think it is important that this feature be put in.

Chairman Proxmire. Absolutely. I think it is shocking that it is not there, and I am glad that you highlighted that and I hope we can urge that they put it in.

MAJOR SYSTEMS DELIVERED WITHOUT SUBSYSTEMS AND DELAYS NOT REPORTED

Mr. Keller. No. 2. Major systems delivered without essential subsystems, delays in acquiring Government-furnished equipment, and problems in technical performance of Government-furnished equipment are not required to be reported.

Chairman Proxmire. Once again this means that delays are not reported so you don't have a notion as of a certain time whether a program is on schedule or not.

Mr. Keller. You cannot look at the SAR report and tell where your problems really are.

Chairman PROXMIRE. You cannot.

Mr. KELLER. You cannot, without this type of feature in it. In other words, if there is a delay in acquiring Government-furnished material and other problems—if that showed up in the SAR report the way I visualize it, it would give you a better picture of what is going to happen down the road, and perhaps a clue to where to get something changed or to get some expediting or additional effort put on it to try to cure that deficiency at that point in time.

Chairman PROXMIRE. So once again you have a system in which the cost is right and the performance is good but it may be, in this kind of age in which we operate, it may be delivered so late it is not worth very much. These weapons become obsolete in a hurry, don't they? The name of the game, as I understand it——

Mr. KELLER. Many of them do; yes, sir.

Chairman PROXMIRE (continuing). Is trying to stay ahead in this technological race and if you have delays that go on and on, that can be a most important element in evaluating the progress of a program.

Mr. KELLER. I think it could.

Chairman PROXMIRE. And you don't have that in this report.

Mr. KELLER. Mr. Bailey would like to add something on this.

Mr. BAILEY. There is another factor involved here, Mr. Chairman. For example, if a major system is delivered without an essential subsystem, a gun, radar, or something of this kind, this means that those systems that are delivered without that will have to be backfitted when these become available and, of course, this involves additional costs.

Chairman PROXMIRE. And that involves additional costs as well as delay.

Mr. BAILEY. Yes, sir.

Chairman PROXMIRE. And that factor won't be made available in the SAR report as of now.

COSTS INCURRED NOT RELATED TO PHYSICAL PROGRESS

Mr. KELLER. No. 3. Costs incurred at a particular point in time in relationship to the cost that should have been incurred for the physical progress of the work that has been attained are not reported. This, in a nutshell, Mr. Chairman, is a milestone, something you can measure against. We think it is important that it should be included in that type of system.

Chairman PROXMIRE. That means without this report the degree of the overrun just won't be known, would it?

Mr. KELLER. I think that is correct, sir.

Chairman PROXMIRE. That seems to be another significant shortcoming.

CHANGES NOT REPORTED

Mr. KELLER. No. 4. Significant pending decisions that may have a major impact on the program such as changes in quantities or deliveries are not reported.

This, too, is important if one is to be able to look at the SAR report and tell where you are, what your problems are at the present time, and where you are going.

Chairman PROXMIRE. If Congress is going to act with any degree of responsibility they ought to know this kind of information. Without that we are likely to make a mistake and authorize a weapons system that shouldn't be authorized or approve it or provide more appropriations for it at a time when it doesn't deserve it.

Mr. KELLER. I should point out, Mr. Chairman, that DOD is well aware of most of these problems and has given them a great deal of attention and is continuing to give them attention. I believe that many of the shortcomings we found in the SAR system will be cured. It is a very complicated system, and I think in all fairness it is going to take a little time to work it out satisfactorily. But I think DOD has made a start, and I think a good start, and I think it can be shaped up so we will have a good reporting system for all of us to use.

SCHEDULE SLIPPAGES NOT REPORTED

No. 5. Mr. Chairman, the system does not show a comparison of quantities delivered with quantities scheduled to be delivered at a point in time.

Chairman PROXMIRE. Again this seems to be essential. If you want to know the overrun, you ought to know the comparison of the quantities delivered with the quantities scheduled to be delivered in point of time. If that is not made, how can you really know the overrun? Can you?

Mr. KELLER. I think it would tie into an overrun situation but more important are the questions: Is the contractor meeting the delivery dates? Are we going to get this weapon in time?

Chairman PROXMIRE. Now, in appendix I, I want you to proceed, but in appendix I you have a number of overruns and you base them on several comparisons.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. As I understand it, the qualifications you have given us, these five shortcomings of the SAR report, should be kept in mind in appraising the overruns you reported here. In other words, these are rather conservative expressions. They are not—they could very well be much greater if we had a complete SAR system, and if we knew all this information which you say is missing and should be there.

Mr. KELLER. Mr. Chairman, in looking at the attachments to our statement, both appendixes I and II, you should keep in mind that they are the figures as reported on the SAR system as of June 30, 1969. Now we have pointed out shortcomings in the SAR, so these shortcomings will naturally have to play a part in those figures. Now whether they go up or down I couldn't guess at this point, but they are qualified figures to that extent.

Chairman PROXMIRE. I doubt very much that they would make them go down. In view of the nature of these omissions it would seem to me the very great likelihood is in most cases they would go up and in most cases would go up very sharply. Is that——

Mr. KELLER. I really can't——

Chairman PROXMIRE (continuing). A fair statement?

Mr. KELLER. I will have to beg off on that.

Improvements in SAR System Feasible

Chairman Proxmire. All right. Let me ask at this point, you say you are urging the Defense Department to make these corrections and you are confident that they will do their best and make corrections. I am not so confident in view of the results we have had over the past. You have seen about the operations in the Pentagon, not that I don't have great faith in Mr. Packard and Mr. Laird, I think they are both very able men doing the very best they can, but is it your feeling that this is something that can be done technically, that there is nothing preventing the accomplishment of these, correction of these, five shortcomings?

Mr. Keller. I think it can be done.

Chairman Proxmire. Would it require a great deal of cost or excessive staff or would it require anything that you think, any reason, why it shouldn't be done promptly?

Mr. Keller. I think it might take a little time and I say that only because the Department of Defense and the three military services are pretty big operations and it is awfully hard to get things from the top down to the bottom.

Chairman Proxmire. These are major systems. You are not asking for a comprehensive report on everything they come along with, you are just asking the major weapons systems.

Mr. Keller. Yes, major weapons systems at this point.

Chairman Proxmire. And you think this is something that can be done in a reasonable period of time and there is absolutely no technical reason in the world why they can't meet every single thing you specified.

Mr. Keller. I don't think so, Mr. Chairman. I might ask Mr. Bell who has worked on this particular phase.

Chairman Proxmire. You don't know why they cannot.

Mr. Keller. No.

Mr. Bell. Mr. Chairman, I have discussed these items, these five items, with the OSD. Item 3 has already been put into their new instructions. I am led to believe the others will also be adopted.

Chairman Proxmire. All right.

Inconsistencies in data reported

Mr. Keller. Mr. Chairman, we, also, noted some inconsistencies with the data reported in the SAR's. For example, there was a lack of consistency in (1) the reporting of early developmental costs, (2) treatment of costs attributed to inflationary trends in the economy, (3) treatment of costs involving contract incentive/penalty provisions and claims for equitable adjustments, and (4) the reporting of costs involved in modifying an existing system to accommodate a new subsystem.

Inflation

Chairman Proxmire. Let me just ask you a question about the treatment of costs attributed to inflationary trend in our economy. This is something the experts from the Pentagon come here and blame

everything on inflation, "After all everything has gone up in price. We expect costs to go up in price because we do suffer from inflation." You go out to buy a lawnmower or snow shovel and you find prices are up. When you say treatment of costs attributable to inflationary trends, do you mean they are not allowing enough in anticipating inflation or that they allow too much or what is the significance of that?

Mr. KELLER. It is my understanding, Mr. Chairman, that there is lack of consistency in what they estimated for inflation. Some of these systems go back several years. Some of the original planning estimates did not include a figure for inflation. Others include a percentage, and still others might include a higher percentage. So we are talking about a consistent treatment of inflation costs.

Chairman PROXMIRE. Why can there not be a rather precise advance estimate of inflation based on real factors, for example, if it is in the area of aviation, there are certain inflationary factors—wage and material increases, costs which you can anticipate, and which you can at least keep adjusting as time goes on, so that you can determine just about what was the inflation factor as compared with other factors, isn't that correct?

Mr. KELLER. I think that is correct. I was really talking about the treatment of it at the time the estimates were made.

Chairman PROXMIRE. There is no mystery now. We have now the best economic statistics in the world, we have comprehensive economic statistics on wage increases, wage and productivity increases; we know the cost of components, how much they have gone up, and while we cannot foresee the future, we can come fairly close, it would seem to me, to make a fairly reasonable inflation estimate of any past work on a program.

Mr. KELLER. That is certainly correct, Mr. Chairman. What we are trying to point out here is that the SAR system itself, and the reporting that goes into it, is not consistent among the reporting groups and we think it is very important that it is consistent because we might be dealing with the old apples and oranges business if they are not treated in the same way.

Chairman PROXMIRE. Can you give us any generalized conclusion on the Defense Department's use of the inflation factor with regard to the overruns that you report later in your report? Do you think that they have failed to state, allowed for, the inflation factor in general or they allowed for it even adequately or they allowed for it too much. Can you make any generalization?

Mr. KELLER. Mr. Bell, would you care to answer that?

Mr. BELL. Mr. Chairman, the point made by Mr. Keller about the lack of uniformity, I would like to press. The Navy pretty generally in shipbuilding programs includes a factor for project growth, including a factor for inflation. In the programs included in our study, the factor has not been as large as the growth they have actually experienced.

In many of the Army programs and Air Force programs the factor for inflation was not included at all. In some of the later programs they began an attempt to crank an inflation factor into them; this is fairly new and is not uniformly applied

One of the problems we have addressed in this study is the problem with explanations for the growth in systems. The reasons for it are simply not explained in sufficient detail so that we or the Department of Defense can really tell what is inflation, what are changes in programs, et cetera, and we think this is one of the things they have to address themselves to in the SAR reporting system.

Chairman PROXMIRE. You can't give me any conclusion, generalized conclusion, if they allowed adequately for inflation or not enough for inflation in these overrun reports that you have.

Mr. KELLER. Not as yet, but we think the work we are going to do in the second phase of our review will probably result in some ideas about that.

Chairman PROXMIRE. You see our experience in the C–5A and other weapons systems was the Air Force and the other procurement agencies allowed and allowed rather radically for inflation, but they would try to claim inflation in addition to the inflation they had already built into the allowance on the contract in many cases.

All right, go ahead, sir.

Mr. KELLER. Mr. Chairman, as I mentioned earlier the Department of Defense is aware of most of these problems and a great deal of attention has been and is continuing to be given to their resolution. A new instruction on the preparation of the SAR's was issued earlier this month by the Secretary of Defense and it is expected that the system will be improved substantially. Specifically, this new instruction does require comparisons of planned and actual technical performance and planned and actual deliveries.

REQUIRED PROGRAM COST DATA NOT INCLUDED IN 20 PERCENT OF SAR'S

Making a meaningful analysis of the systems costs from the information shown on the SAR's has been a most troublesome task. Our difficulty stems primarily from a lack of consistency by the military services on the type and extent of cost information that is included in the SAR's. We found that approximately 20 percent of the SAR's covering the systems we reviewed did not include certain required program cost data.

We are currently attempting to identify missing data and determine the reasons for differences in the program costs shown in the SAR's and DOD cost figures for the same time frame. We expect to be able to reconcile these differences and be in a position to address total cost for the 57 systems covered by our current work in the report we plan to submit to Congress in, we hope, within the next month.

However, we have been able to make comparisons of cost growth [1] on 38 [2] systems using as milestones original planning estimates, contract definition estimates, and planned costs at current quantities and we have compared these to the estimates to complete total programs.

Chairman PROXMIRE. Let me ask you at this point——

Mr. KELLER. Yes, sir.

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[1] This comprises a dollar growth for many and sundry reasons such as inflation, added capabilities and design changes, technical problems, quantity increases, etc. The figures used are essentially those reported by DOD.

[2] The 38 systems comprise eight Army systems, 22 Navy systems, and eight Air Force systems.

Chairman PROXMIRE. I want to discuss your summaries of the SAR's. I know that the figures date from June 30——

Mr. KELLER. That is correct, sir.

Chairman PROXMIRE (continuing). 1969, this past year. Are these the latest figures available?

Mr. KELLER. We worked with the June 30, 1969, figures because we wanted to get our work started last summer. The June 30 figures were available about the middle of September. There are some later figures for September 30 which were not available until about a month ago.

Mr. BELL. No, more nearly like the middle of December.

Chairman PROXMIRE. At any rate they are available now but not available in June initially.

Mr. KELLER. That is right. We are dealing with the June 30 figures because we are familiar with those figures and have been working with them.

BLANKS IN SAR

Chairman PROXMIRE. I note a number of blanks in your weapons system data.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. Why are there no figures for those blanks?

Mr. KELLER. Those figures did not show up on the SAR.

Chairman PROXMIRE. Why not?

Mr. BELL. Which table are you referring to, Mr. Chairman, appendix II?

Mr. KELLER. Appendix II.

CH–47 HELICOPTER

Chairman PROXMIRE. For example, the CH–47 helicopter, the current estimate is $1.3 billion, yet there are no earlier estimates, why not?

Mr. BELL. The CH–47 is a very old program and it is approaching its later stages of production and these estimates were either not prepared or were prepared and now cannot be located so the information just was not available. The CH–47 program, as I remember, goes back into the fifties.

Chairman PROXMIRE. Is this program in an overrun condition or not?

Mr. BELL. I think it is hard to say whether it has overrun. It has grown considerably from the original estimates of the numbers of the aircraft involved. We have nothing to compare with to show whether it is overrun or not.

POSEIDON

Chairman PROXMIRE. How about the Poseidon, appendix II, you have in your planning estimates, you don't have any figure at all, contract definition figure but no planning estimate.

Mr. BELL. These, Mr. Chairman, simply were not prepared by the program office.

Chairman PROXMIRE. What's that?

Mr. BELL. The original planning estimate and the initial planning estimate for it just simply were not prepared by the Navy and made a part of the SAR.

Chairman PROXMIRE. Why not?

Mr. BELL. I don't know.

Chairman PROXMIRE. Have you complained about it?

Mr. BELL. We have talked to the Navy people about that but we have not resolved the issue as to why they were not prepared.

SUBROC

Chairman PROXMIRE. I hope you persist in that and let us know when you find out what the answer is. The Subroc is the same kind of a problem, there is no planning estimate there. It seems this probably results in an underestimate of the overrun.

Mr. KELLER. I would like to point out, Mr. Chairman, we did not attempt to put our figures from a collateral source into the SAR.

Chairman PROXMIRE. I understand.

Mr. KELLER. These are figures off the SAR system and that is part of the shortcomings we see.

Chairman PROXMIRE. Correct. I hope whenever the figures are available I hope we will put them in the record in the very near future when available.

Mr. KELLER. We will be very glad to do so, Mr. Chairman.

(The supplemental SAR data on the Poseidon program follow:)

POSEIDON

The June 30, 1969, supplemental SAR on the Poseidon program did not contain a "Planning Estimate" column. According to the Director, Plans and Programs Division, Strategic System Project Office, the original planning estimates included the engineering evaluation phase of the program and did not reflect any acquisition costs. Therefore, according to this official, this column would not be applicable to the Poseidon program since the SAR is intended to represent acquisition cost.

Chairman PROXMIRE. All right. You may proceed.

SAR INSTRUCTIONS REQUIRE

Mr. KELLER. As a means of displaying the current status of estimated program costs, SAR instructions require that these data be arrayed in columnar form to show:

1. Original planning estimates,
2. Contract definition costs estimates,
3. Planned costs at current quantities estimates, and
4. Current estimate to complete the total program.

ORIGINAL PLANNING ESTIMATE

The original planning estimate appearing on the SAR should be the earliest formal estimate prepared by the military department of cost anticipated to be incurred to acquire the quantities needed. It is prepared prior to the initiation of the formal acquisition cycle and usually serves as a basis for initial appropriation requests. Contract definition cost estimates are refinements of the initial planning estimates and are prepared during the course of the project definition phase in which preliminary design and engineering are verified or accomplished, and contract and system management planning are performed. This cycle frequently extends over a period of a year. The

planned costs at current quantity estimates are refinements of the earlier estimates adjusted for changes in quantities of the system to be bought. The final estimate is intended to be a current, objective estimate of the costs expected to be incurred to accomplish the entire program and is adjusted for changes in quantity as well as current estimates of cost due to inflation, changes in scope, capability increases, program stretchouts, et cetera.

Chairman PROXMIRE. I think it is very, very important to understand that paragraph to evaluate the cost overruns that you reported in your appendix. In other words, what you are saying is that you have corrected, or have you, for inflation, for changes, for capability increases, for program stretchouts.

Mr. KELLER. Well, the current estimate of the total program, which is the last column over an appendix 2 is supposed to take those items into consideration.

Chairman PROXMIRE. So if you report for the Navy, for example, as I recall, over all you reported about a 50 percent cost overrun for all of these weapons, and this is a cost overrun in addition to the increases owing to inflation, changes, capability increases and so forth, is that right?

CURRENT ESTIMATE TO COMPLETE

Mr. KELLER. The "current estimate to complete" figures should take into consideration the changes in quantity, changes in specifications and inflation, and so forth. Their figures as of June 30, is their estimate of the cost of completing the program as of that date, in other words, for the total program as of that time. Naturally in figuring that you would certainly take into consideration the inflation, for example, that has happened, the changes in quantities, and I would think in some cases they have cranked in estimated inflation for the future depending on the life of the program. Some of these programs have several years to run.

Chairman PROXMIRE. What I am getting at, I want to get this just as accurately and as clearly as possible, I want to know whether or not an allowance has been made for inflation, allowance has been made for changes, and allowances have been made for performance or anything of that kind in comparing table 1 with table 4—column 1 with column 4.

Mr. KELLER. It is my understanding that it has. That does not mean that we may not have some more changes on the September 30 SAR. In other words you may have changes in operations and you may have changes in quantities.

Chairman PROXMIRE. In other words, whether you call it cost growth or cost overrun, this is not the result of inflation or result of changes. It is a result of other factors, mistakes in management, poor estimating, so so forth?

Mr. KELLER. Some of it would be as a result of inflation, if you go back to the original planning estimates, if they didn't include that in. Some of it would be as a result of change in quantities or specifications.

MBT–70

Chairman PROXMIRE. Let me ask you about the MBT–70 which has been a controversial program involving a large cost overrun, schedule slippages and questionable performance. Why is it not included in your review of major weapons systems?

Mr. BELL. At the time we made our selection for the systems to be included in this study, our office was already making a similar study of the MBT–70 and one other program. We simply excluded those programs from this study.

Chairman PROXMIRE. Can you supply the appropriate figures for the record?

Mr. BELL. Yes, sir, we can do that.

(The figures follow:)

MAIN BATTLE TANK (MBT–70) PROGRAM COSTS

[In thousands of dollars]

Program costs	Planning estimate (1)	Contract definition plan (2)	Planned costs and current quantity (3)	Current estimate total program (4)
Research, development, test, and evaluation	101.4	101.4	101.4	245.8
Total production	1,979.1	1,979.1		
Total program costs	2,080.5	2,080.5		

Source: Taken from MBT–70, June 30, 1969, SAR.

DEEP SUBMERSIBLE RESCUE VEHICLE (DSRV)

Chairman PROXMIRE. Another program not included in your review is the deep submersible rescue vehicle, where we had the most shocking overrun I had ever seen or heard, where it went from $3 million to $80 million a unit. I understand you have already completed a study of this program and the report has been prepared for distribution. Can you supply this subcommittee with a copy of your report for the record?

Mr. KELLER. Yes, sir.

(The following information was supplied for the record:)

The report is being prepared for forwarding to the Congress. It is expected to be available during January. A copy will be provided directly to the subcommittee staff.[1]

Chairman PROXMIRE. Briefly, what are the facts on the cost overruns and the cost history of the deep submersible rescue vehicle?

Mr. KELLER. Mr. Rubin, would you like to review that?

Mr. RUBIN. Yes, sir.

Mr. Chairman, at the time we conducted our preliminary look at this program, we noted that the original program estimate at the time that the program was conceived was a figure of $36.5 million, the estimated costs for the program.

Chairman PROXMIRE. That was for 12 units?

[1] GAO Report No. B–167325, "Evaluation Need of Cost-Effectiveness of Four More Deep Submergence Rescue Vehicles Before Purchase by the Navy" (Feb. 20, 1970), may be found on p. 117.

Mr. RUBIN. That was 12 DSRV's.

Chairman PROXMIRE. Or $3 million apiece roughly?

Mr. RUBIN. The figure represented a cost roughly of operating the program for 5 years, total program costs, not just the hardware costs.

Chairman PROXMIRE. So the hardware costs would be less than $3 million apiece.

Mr. RUBIN. Yes, sir.

In addition the thought was expressed at that time that by entering into this program the Navy could eliminate a program then running which cost more than that. Consequently they actually anticipated a savings by implementing this program.

EXPECTED SAVING DID NOT MATERIALIZE

Our further study showed that the program that was to be eliminated had to be retained so that the expected saving did not materialize.

Chairman PROXMIRE. What was that last, I didn't get the last.

Mr. RUBIN. The program that was to be eliminated by use of the DSRV could not be eliminated and still would have to exist; therefore, the expected saving did not materialize.

COST OVERRUN

In addition the program cost that was originally estimated at $36.5 million went up considerably, and the latest figure we have is $463 million.

Chairman PROXMIRE. $463 million?

Mr. RUBIN. Yes.

Chairman PROXMIRE. From $36 to $463. How many units?

Mr. RUBIN. Six.

Chairman PROXMIRE. Six units?

Mr. RUBIN. Right.

Chairman PROXMIRE. So that would be around $77 or $78 million per unit?

Mr. RUBIN. Again this figure represents hardware and also additional costs for the purposes of carrying out the program. This is not——

Chairman PROXMIRE. It surely represents a lot of additional costs. At that fantastic increase.

Mr. RUBIN. This means training and maintenance and other facilities required to carry out the program—total costs.

Chairman PROXMIRE. Yes.

Mr. RUBIN. Our study showed there were two DSRV's then in production, the other four had not as yet been ordered; in fact they have not been ordered to date. Consequently we wrote a letter at that time to the Department of Defense pointing out that there were some questions as to the advisability of proceeding with the remainder of the program because of the additional cost and other factors.

Chairman PROXMIRE. What was the date of that?

Navy to Reconsider Need for Additional DSRV's

Mr. Rubin. Our letter went out, I believe, in May of this year. It was a classified letter because some of the material in the report was based on classified data from the Department of Defense. We received a response from the Navy in August, also classified, which indicated that they were going to reconsider the need for the four additional DSRV's, and we——

Chairman Proxmire. Wasn't that after we had some publicity on that at the hearings before this subcommittee?

Mr. Rubin. Yes, as I recall this did come up during the hearings you had this summer. We received a reply from them in August indicating they would reconsider the program. We have been in further touch with them and rather recently we were able to get our report cleared for release in unclassified form. We are now proceeding with that report and we hope to release it sometime within the next month. It will be released in January.

The total program is now estimated to cost some $463 million. Of this amount——

Chairman Proxmire. $463 million is the present estimate of the program although they are going to discontinue it?

Mr. Rubin. No; that is the program estimate for the six DSRV's if the program is completed.

Chairman Proxmire. If they would complete the program for six.

Mr. Rubin. That is right. Of that amount $125 million was allocated prior to year 1970, $31 million was in their budget estimates and their figures for fiscal year 1970, and $307 million is planned for fiscal years 1971 to 1974. So that $307 million has not as yet been actually authorized in any way. Of the $307 million about $200 million represents costs associated with the four additional DSRV's. In other words, to carry on the program with the two DSRV's now being produced and have it in operating condition will cost about $100 million out of the $300 million.

Chairman Proxmire. Will cost how much?

Mr. Rubin. About $100 million; the remaining $200 million is for the additional four DSRV's and all the related costs that will be needed.

Chairman Proxmire. Can you describe what this DSRV looks like? As I understand it is a deep submersible rescue vehicle to help rescue submarine crews. We have some question as to whether it was justifiable at any cost in view of the fact there were other better methods currently available and there was only one incident in the last 40 years where it would have been of any use at all.

Mr. Rubin. The instances in which they could be used were two; I think there were two disasters in which it could have been used.

Chairman Proxmire. In how many years?

Mr. Rubin. 40 years.

Chairman Proxmire. 40 years. Does it look like a bathysphere?

Mr. Rubin. It looks like a miniature submarine; it weighs 35 tons, about 50 feet long.

Chairman Proxmire. Is it mobile on its own power?

Mr. Rubin. It is mobile on its own power. However, it is transported by air to a port near the point of disaster and is then transported by vessel or submarine to the disaster location.

Chairman PROXMIRE. Is the large expenditure which has been made and will be incurred in this program justified, in your opinion?

Mr. RUBIN. I can't very well answer that question. There are some values, some benefits which this program will provide. I am not in position to say whether they are worth the efforts that have been expended.

Chairman PROXMIRE. What are the benefits?

TWO DSRV'S WOULD BE SUFFICIENT

Mr. RUBIN. Well, this does provide capability they haven't had before to some extent. My position is that the two they have in construction probably will be sufficient to take care of rescuable disasters because, as you pointed out, the number of disasters is very rare. Furthermore, because they are air transportable they can be brought to any location very quickly. Consequently we feel the two will provide the necessary backup, one will back up the other, and in addition to this there are already other rescue systems available.

Chairman PROXMIRE. What is the explanation for the enormous cost overruns?

POOR ESTIMATING

Mr. RUBIN. Well, poor estimating, this is the general contention, and inflation as you mentioned is another factor brought in.

Chairman PROXMIRE. To say inflation is a factor here is ridiculous. We have had 4- or 5-percent inflation lately. It will be 6 percent. So an annual inflation of 6 percent may be reasonable. But to say inflation is responsible for increasing unit cost from $3 million to $80 million is certainly overstating it; $3 million, or $3.8 or $4 million, but to go up to what it has——

Mr. RUBIN. I think the major reasons involve the poor estimating. They apparently did not estimate the difficulties involved in this program.

Chairman PROXMIRE. Was getting it declassified responsible for most of the delay in your report?

Mr. RUBIN. We were unable to release the report in unclassified form as written. We didn't feel we should release it in a classified form, and we pursued this matter with the Navy. Actually the period involved from the time of their initial reply in August to the time in which it was cleared in November, approximately 3 months, was to get the report into declassified form.

Chairman PROXMIRE. As I understand, if they only build two of these the cost of the program will be $100 million.

Mr. RUBIN. No; that represents the additional costs from here on in.

Chairman PROXMIRE. And they have already expended about $130 million?

Mr. RUBIN. About $156 million.

Chairman PROXMIRE. $156 million expended?

Mr. RUBIN. Expended or allocated to this point. Some of this money might not have actually been expended.

Chairman PROXMIRE. If they only built two it would be about $250 million, or about $125 million apiece?

Mr. RUBIN. Again I should point out this is not only hardware but operations, maintenance, and training, et cetera.

Chairman PROXMIRE. Tell me if they had use of this only twice in 40 years why do they have to have more than two? Do they expect to have six accidents within a few years, and you say it is mobile and it can be flown.

Mr. RUBIN. Well, this is our purpose in issuing the report. Our purpose in issuing the report is to have reconsideration of whether there is need for the additional four DSRV's in view of the facts you have mentioned. In view of the tremendous increase in costs, the fact that the number of disasters is rare and the air transport ability of the item, we believe a review is warranted as to whether the additional DSRV's are worth the additional costs involved.

Chairman PROXMIRE. What firm is building this?

Mr. RUBIN. Lockheed Missiles Space Co.

Chairman PROXMIRE. Lockheed.

Mr. RUBIN. Yes.

Chairman PROXMIRE. Which Lockheed?

Mr. RUBIN. This is out in Sunnyvale, Calif.

GAMA GOAT

Chairman PROXMIRE. I would like to ask you about the program called the Gama Goat. This shows an increase in costs from $69.1 million to $373.6 million. Tell us first what the Gama Goat is, then explain how it has grown to five times its original size.

Mr. BELL. Mr. Chairman, that was one of the systems included in our study of the 57 systems.

Chairman PROXMIRE. What is the Gama Goat first?

Mr. BELL. The Gama Goat is a wheeled vehicle resembling a jeep with a trailer. The specific reasons for growth in this particular program I don't have with me this morning.

Chairman PROXMIRE. It is a wheeled vehicle. Is it for transporting personnel, transporting weapons; what is its purpose?

Mr. KELLER. Troops and equipment, either one.

Mr. BELL. Yes.

Chairman PROXMIRE. Personnel or equipment or both.

Mr. KELLER. Yes.

Chairman PROXMIRE. You say it is like a jeep?

Mr. BELL. Yes; it vaguely resembles a jeep; fairly small.

Chairman PROXMIRE. That sounds like something that shouldn't have this explosion in costs. It has gone from $69 million to $373.6 million.

Mr. BELL. As I said, I do not have with me this morning the details on the reason for the costs. I can either get them within a very short while or we will be happy to furnish them for the record.

Chairman PROXMIRE. Do you know if it is in production now?

Mr. BELL. I believe it is in production.

Chairman PROXMIRE. It is in production?

Mr. BELL. I believe it is in production.

Chairman PROXMIRE. Do you know how many they are building?

Mr. BELL. Not off hand, no, sir. The number has increased.

Chairman PROXMIRE. Well, give us the details as soon as you can. We would like to know because this is a conspicuous example, what seems to be a prima facie example, of overrun.

Mr. BELL. Yes.

(The supplemental data on the Gama Goat system follows:)

The Gama Goat (M-561) is a 1¼ ton, 6x6 wheel drive, cargo truck. It is designed to have high mobility over adverse terrain with floating, swimming, and air-drop capabilities. This will permit its operation in the same environmental terrain as the units that the vehicle is intended to support.

The vehicle is intended to feature ease-of-maintenance, reduced fuel consumption and maximum utilization of standard military parts. It is suitable for use as a re-supply vehicle and as a prime mover for towed artillery. Additionally, by use of kits, the vehicle can be used as a weapons carrier and as a communications center. There is also an ambulance version.

Although the June 30, 1969, Selected Acquisition Report (SAR) showed a planning estimate of $69.1 million, a representative of the project manager's office informed us that this was not an estimate of the total program. Rather, it represented an estimate of the initial planned procurement of vehicles in 1964.

The SAR includes a cost analysis section which provides cost data on the increase from $69.1 million representing the original plan to the current estimate total program of $373.6 million.

The prime reason for the cost growth cited on the SAR was attributed to the increase in number of vehicles being acquired. Other reasons cited were items added to the vehicle, underestimate of certain components, and cost escalation from 1964 to 1968.

Chairman PROXMIRE. It has been suggested to me by the staff that on this project the American taxpayer seems to be a Gama Goat.

AIRCRAFT CARRIER "JOHN F. KENNEDY"

I understand when the aircraft carrier, *John F. Kennedy*, was let out for bids that the Navy formally advertised it. In view of the fact that only one shipyard in the country has the capability of making an aircraft carrier, what was the point of formally advertising this program?

Mr. KELLER. Mr. Chairman, actually, we don't think there was any need to formally advertise that procurement. Procurement of subsequent carriers has been negotiated. So far as I am aware there is only one yard that is capable of building a carrier.

Chairman PROXMIRE. But it was formally advertised.

Mr. KELLER. That is my understanding.

Chairman PROXMIRE. I have a letter from Mr. Staats dated May 12, 1966, to the Secretary of Defense concerning this matter, which I will now place in the record, and ask you whether you are familiar with this letter. In it, Mr. Staats questions formally advertising this program and uses the figure $188.5 million as the price awarded. What was the actual cost of this carrier?

(The letter follows:)

LETTER FROM COMPTROLLER GENERAL TO SECRETARY OF DEFENSE, DATED MAY 12, 1966

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, D.C., May 12, 1966.

DEAR MR. SECRETARY: The General Accounting Office has examined into the Department of the Navy's use of formal advertising for the procurement of the

aircraft carrier CVA 67, the U.S.S. *John F. Kennedy.* Our examination consisted primarily of a review of pertinent records maintained by the Navy's Bureau of Ships and of discussions with responsible Bureau officials.

In January 1965, we forwarded to you for comment a draft of a report on our examination (OSD Case No. 2241), in which we expressed the opinion that the quality and extent of the competition was not sufficient to ensure that a reasonable price had been obtained by formal advertising. It appeared to us that conditions surrounding this procurement were such that the assurance of the reasonableness of the price would have been enhanced had price negotiations been conducted with the low bidder.

The Assistant Secretary of the Navy (Installations and Logistics) forwarded to us the Navy's reply to our draft report. The Assistant Secretary, basing his position on virtually the same facts and circumstances as we had considered, disagreed with our position that the successful bidder had such a determinative advantage that it was practically immune to the stimulus of competition in proposing a price. He concluded by stating that our position was based simply on the fact that the successful bidder had built a greater number of carriers than the other two bidders. He stated further that it would have been inappropriate for the Navy, in this instance, to have rejected the two bids received and undertaken negotiations with the low bidder.

Contrary to the Navy's statement, our opinion was not based simply on the successful bidder's having built a greater number of carriers. Our view was based on several circumstances, which were known or should have been known by the Navy and the shipbuilders involved, including:

1. The successful bidder, as acknowledged by the Chief, Bureau of Ships, was the company with the optimum potential to build the carrier. This optimum capability was based on (a) a work force of adequate size in being, (b) facilities suited without substantial modification for construction of the CVA 67, (c) sufficient mix of skilled trades resulting from peak employment due to a large backlog of work, and (d) economies and production efficiencies existing as a result of having built four of the five carriers in the CVA class awarded to private yards.

2. One of the other two potential bidders would require substantial modification and improvements in its facilities to construct the carrier. Further, this bidder would have to perform certain superstructure work at another yard at additional cost and inconvenience.

3. Although the third potential bidder had previously built a comparable carrier, Navy records indicate that this shipyard had experienced considerable costs in excess of the final contract price. In addition, this bidder in response to a request for a proposal for constructing the carrier preceding the CVA 67 quoted a price that significantly exceeded the price quoted by the other responding bidder. Therefore, its ability to compete pricewise was highly questionable.

An indication that the method of contracting used in this procurement may not have resulted in the lowest possible price to the Government is that there are substantial differences in the individual cost elements included in (1) the Navy's estimate of the cost of construction and (2) the successful bidder's price. A comparison of the individual cost elements disclosed that the successful bidder's estimates for labor-hours and material costs exceeded by a substantial amount the Navy's estimates for these same items. However, since the successful bidder applied lower rates for labor and overhead and anticipated a lower profit rate than that included in the Navy's estimate, the difference between the total of the Navy's cost elements including profit and the total of the successful bidder's proposal was about $1 million. Therefore, it is not unlikely that, had the contract been negotiated and the cost estimates been evaluated, an analysis of these differences could have resulted in a lower price than that proposed by the successful bidder and accepted by the Navy.

We cannot disagree with the Assistant Secretary regarding the inappropriateness of rejecting the bids in this instance after they were solicited on a formally advertised basis. In this connection, once the decision was made to award the contract on the basis of formal advertising, all the procedural steps required by law and regulations were followed by the Navy in the award of this contract.

We still question, however, the Navy's decision to procure the CVA 67 at a price of $188.5 million, under formal advertising at a time when it should have known that one of the bidders had, in our opinion, such a determinative competi-

tive advantage that it would be practically immune to the stimulus or price competition.

While in this instance the Secretary of Defense personally approved the award of this contract, there is no requirement in the Armed Services Procurement Regulation that such approval be obtained. We could find no evidence, however, that *before* bids were solicited a detailed, fully documented evaluation of all pertinent factors had been submitted to the Secretary for his consideration and approval. We believe that thorough consideration at the secretarial level should be given to all the conditions surrounding the plan for a procurement of this magnitude that the optimum form of procurement is used.

We are therefore recommending that you give consideration to requiring military departments and their components, who plan to procure major military items—such as large naval vessels, aircraft, or expensive electronic equipment—on a formally advertised basis under circumstances where sources of supply are limited and other limitations on full and free competition exist, to document their plans fully and submit them to the secretarial level for review and approval.

We do not plan to report further on this matter at this time. We are, however, transmitting copies of this letter to the Chairman, Committee on Government Operations, House of Representatives; to Senator A Willis Robertson and Congressman Hugh L. Carey in view of their previous interest in this matter; and to other interested parties.

Copies are also being sent today to the Secretary of the Navy.

Sincerely yours,

ELMER B. STAATS,
Comptroller General of the United States.

Mr. KELLER. I don't think I have that figure with me. I will supply it for the record, Mr. Chairman.

Chairman PROXMIRE. You don't have that figure? I understand it has been over $220 million. I wonder if you would have any justification for the enormous increase?

AIRCRAFT CARRIER "MIDWAY"

Let me ask you about another, the cost of the modernizing of the carrier *Midway*. I understand that was almost the same as constructing the *John F. Kennedy*, over $200 million just to modernize the ship. Has GAO made a determination of the huge cost overruns on the *Midway*? I understand it was originally estimated at about half that cost.

Mr. KELLER. We have not been into that.

Chairman PROXMIRE. Let me ask you about the DE–1052. Let me say before I leave aircraft carriers, however, we would like to get the figures for the aircraft carriers.

Mr. KELLER. I think we can furnish those figures, Mr. Chairman.

Chairman PROXMIRE. You can provide them for the record.

Mr. KELLER. All right, sir.

(The figures referred to follow:)

The current contract cost (comparable to the $188.5 million mentioned above) for the Aircraft Carrier Kennedy is $241.3 million. The Navy explains this increase as including escalation in wage rates and other inflation factors, a $12 million provisional payment on claims submitted by the contractor, and change orders. The total cost of the carrier, including Government-furnished equipment and other costs, is $274.7 million. Neither of these amounts include other claims which are pending totaling approximately $33 million.

The conversion of the Midway is not completed. This conversion was originally estimated to cost about $84 million and is currently estimated to cost about $202 million. The Navy advises that some part of this increase is the result of improvement to the ship designed after the original estimate was made.

DE–1052 Destroyer

Chairman Proxmire. Can you tell us what the DE–1052 program is?

Mr. Keller. The DE–1052 program is a program of the Navy where they awarded a number of advertised fixed-price contracts to four shipyards for the construction of 46 destroyer escorts, called the 1052 class. The initial contract prices awarded to the contractors totaled about $293 million for 46 ships. There were several shipyards involved, Todd Shipyards of Seattle, Todd Shipyards of Penvada, Avondale Shipyards, New Orleans, and Lockheed Shipbuilding & Construction Co. of Seattle.

What has happened here, Mr. Chairman, is that all four of these shipyards have submitted claims against the Government under the provisions of their contract. The latest information available to us indicates that these claims will total about $278.5 million.

Chairman Proxmire. I want to ask about that. Before I do, let me say, in your table you show a cost increase of only a million dollars. Are you satisfied these figures accurately reflect what has happened to that program?

Mr. Keller. I think we have a footnote on that, Mr. Chairman, if I can find my papers here.

Chairman Proxmire. While you are looking for that, let me say I have a breakdown for this program labeled "Selected Acquisition Reports (SAR) Program Costs/Program 1052 Class/Quarter 30 June 1969." This breakdown shows your totals but has some oddities within it. For example, under postdelivery costs, the program went from $34.5 million to zero. Nonelectronics went from $117.4 million to $48.8 million. How do you explain this drop in costs?

Cost "Growth" Built Into Navy Estimates

Mr. Bell. Mr. Chairman, dealing with your earlier question about the million dollars, as I mentioned previously, the Navy in its shipbuilding program builds into the estimate a provision for project growth. The initial estimate for this particular program included about $140 million, $142 million for expected program growth.

The actual growth in the program as it looks to us is around $300 million.

Chairman Proxmire. Are you saying they built a cost overrun figure into their original estimates?

Mr. Bell. The Navy built a growth factor into its estimates. The Navy has had permission from the Congress to do this on shipbuilding programs for a good number of years.

Now, as to your other two particular questions, I have forgotten the terms——

Cost Items Not Reported in SAR

Chairman Proxmire. Well, the postdelivery costs went from $34.5 million to nothing.

Mr. Bell. This was deleted from their current estimate because of a change in Navy funding policy. The costs will be incurred but it

will be paid for from different funds and, therefore, it is eliminated from this schedule.

Chairman PROXMIRE. So it is shifted out from this table, so really it is not an increase of a million dollars but $35 million.

Mr. BELL. Yes, sir.

Chairman PROXMIRE. In addition, nonelectronics went from $117.4 million down to $46.4 million.

Mr. BELL. Exactly the same explanation.

Chairman PROXMIRE. And here you have, therefore, an increase of about $70 million.

Mr. BELL. Right.

Chairman PROXMIRE. But it does not appear in your table.

Mr. BELL. In addition there is a rather sizable claim that has been filed that is not reflected in these figures either.

CLAIMS NOT REPORTED IN SAR

Chairman PROXMIRE. $100 million in claims.

Mr. BELL. Approximately.

Chairman PROXMIRE. That also is not reflected.

Mr. BELL. No, sir.

Chairman PROXMIRE. It does not include the claims now pending against the Navy in this program.

Mr. BELL. No; not that one claim. There have been some claims paid but the figure does not include those claims that have not been paid.

Chairman PROXMIRE. $100 million in claims against the Navy that has been paid out to the shipyards you say has been included?

Mr. BELL. Yes; about $80 million.

Chairman PROXMIRE. There is another $90 million pending in addition to that?

Mr. BELL. Yes.

Chairman PROXMIRE. If all the claims paid and pending, and all the costs of this program which are not attributed to it in this breakdown were taken into consideration, how much of a cost overrun would we have?

COST "GROWTH"

Mr. BELL. Cost growth of about $300 million.

Chairman PROXMIRE. Yet this table indicates $100 million, but it is $300 million when you get all the inconsistencies, and so forth, ironed out.

Mr. BELL. Yes.

Chairman PROXMIRE. Have you been able to identify similar overruns on other programs of this kind?

Mr. BELL. No; not of the same nature. This type of thing seems to be peculiar to that particular program.

POSEIDON PLANNING ESTIMATES NOT REPORTED

Chairman PROXMIRE. Now you show an overrun of over $1.3 billion, that is $1,300 million, on the Poseidon program. But the planning estimate is a blank. Why is this figure present?

Mr. BELL. Well, it was explained to us, and we didn't attempt to examine the rationale here, that Poseidon is a somewhat more elaborate Polaris and, therefore, the Navy moved directly from the Polaris program to their contract definition stage.

Chairman PROXMIRE. Can you provide the planning estimate for the record?

Mr. BELL. There was none that we were able to find.

Chairman PROXMIRE. There wasn't any?

Mr. BELL. Not that we were able to find.

Chairman PROXMIRE. This puzzles me because I have heard from the Senators on the Armed Services Committee and elsewhere that the Poseidon is very complicated and it is a weapons system that has some real problems connected with it, and the notion this is just another Polaris, it is just that simple, is being contradicted by experience.

Mr. BELL. The explanation we have is that the basic difference between the two is that the Poseidon has this additional capability of the MIRV for the warhead.

Chairman PROXMIRE. Did the Navy tell you that there was no planning estimate?

Mr. BELL. Yes. They didn't tell me personally but they told my staff; yes.

Chairman PROXMIRE. Tell you in writing?

Mr. BELL. No.

Chairman PROXMIRE. Who was it who said this?

Mr. BELL. I don't have his name, Mr. Chairman.

Chairman PROXMIRE. Can you get that for the record?

Mr. BELL. I am sure we can.

Chairman PROXMIRE. All right. I wish you would.

(The data referred to follows:)

The information was provided by the Director, Plans and Programs Division, Strategic Systems Project Office. It was confirmed by Admiral Smith in his testimony before the Subcommittee on December 31, 1969.

NAVY'S REASONS FOR COST OVERRUN

Chairman PROXMIRE. Can you explain why the program has increased in cost by $1.3 billion?

Mr. BELL. I can give you the Navy's explanation as shown on the SAR. Approximately $800 million of the $1.3 billion is explained on the SAR as being due to a combination of inflation and over- and under-estimates with no breakdown as to——

Chairman PROXMIRE. Let's see if we can separate those two. How much of this is inflation and how much is a matter of over- or under-estimate?

Mr. BELL. We could not get those details at the time we were making this analysis.

Chairman PROXMIRE. This is one of the most significant and largest overruns we have in any weapons systems and it seems to me the Congress and the public had a right to have the details on this. It is an enormous amount of money.

Mr. BELL. I discussed this with the officials of this particular program, and they are in the process of developing this but they tell me there are thousands and thousands of individual actions that contributed to this, and they didn't give me an estimate as to when this job would be completed.

No GAO Study of Contractor's Site

Chairman Proxmire. Has the GAO made a study at the contractor's sites to determine why the costs have skyrocketed on this program?

Mr. Bell. Not for that purpose, Mr. Chairman. Our essential job here was to test the workings of the SAR reporting system. We did go to contractor's plants to make verification that the data that were going to the program managers from the contractors were the data that came from contractors' books. As Mr. Keller mentioned in his statement, we have further work underway which will go into this subject considerably more deeply.

Mr. Keller. What we are trying to do, Mr. Chairman——

Chairman Proxmire. Yes.

Mr. Keller. In this report we are planning to make next month is to give this overall viewpoint. Then as a second step we are going to go back and try to ferret out the reasons for these overruns and for the problems that have developed, and I think that perhaps suggest some of the cures for the future.

Chairman Proxmire. All right. Sir, I apologize for having interrupted you. Go right ahead.

Not All Cost "Growth" Can Be Prevented

Mr. Keller. Yes, sir, in discussing cost growth we believe it is important to recognize that not all cost growth can reasonably be prevented and that some cost growth, even though preventable, may be desirable. Unusual periods of inflation, for instance, result in cost growth. Changes in the state of the art make it possible to incorporate modifications that result in an overall increase in the cost effectiveness of the system. Such cost growth cannot always be anticipated, particularly where a weapons system is in development and production over a long period of time. We believe that the greatest concern should be with cost growth that results from such things as faulty planning, poor management, bad estimating, or deliberate underestimating. Our analysis of the cost growth that has occurred in the weapons systems we reviewed is not as yet complete and we are, therefore, unable to segregate cost growth by its various causes. To be fully meaningful such analysis is essential so that the undersirable and preventable can be identified. The cost growth discussed here today includes all cost growth that has been identified. It is not necessarily all preventable or even undesirable.

Cost "Overrun" Versus Cost "Growth"

Chairman Proxmire. Let me ask you at this point, Mr. Keller, have you agreed to permit the Pentagon to solve the cost overrun problem by exterminating the words "cost overrun" and substituting the word "growth"?

Mr. Keller. I don't think it really solves the problem, Mr. Chairman. I think our feeling is that perhaps——

Chairman Proxmire. Why shouldn't you use "cost overrun"? Why isn't that a good term?

Mr. Keller (continuing). It is a term that implies that everything that happened was preventable, which isn't always the case.

Chairman PROXMIRE. Why does it imply that? Cost overrun, it seems to me that is about as neutral a description as you can have, the cost overran, the cost was higher. When you say "cost growth," however, there are several semantic advantages that cost growth has for the Pentagon. For one thing we are all for growth, growth of the economy, growth of our children, growth of our moral stature, and so forth. Growth is a good word and growth is something that sounds as if it is wholesome and logical and necessary. It seems to me the "overrun" is by far the more accurate descriptive term.

Mr. KELLER. Well, it may be. Perhaps we can compromise and use both of them.

Chairman PROXMIRE. I notice in your statement you refer to "underruns." This is an interesting word in view of your recent elimination of the word "overruns."

Mr. KELLER. Perhaps we might have said "under growth."

Chairman PROXMIRE. You might have said "cost shrinkage" instead of underruns as we are now being taught to say "cost growth" instead of "cost overruns."

Go right ahead.

COST "GROWTH" TOTALS

Mr. KELLER. Comparing the estimates through program completion, that is, the current estimate—and I am again referring to tables I and II—with earlier estimates prepared on the basis of (1), (2), and (3) above, we found that the 38 systems show a cost growth of $20.919 billion or 49.85 percent from original planning estimates; $13.051 billion or 26.2 percent from contract definition cost estimates; and $13.819 billion or 28.2 percent from planned costs at current quantity estimates.

Chairman PROXMIRE. Let me say at this point these overall figures don't include the blanks that you had to leave out; it does not include the $30 million.

Mr. KELLER. No, sir; we did not have all the figures and they are not included.

Chairman PROXMIRE. Once again I think this is a conservative statement of the overruns.

Mr. KELLER. Appendix I to our statement is a summary showing, by service, the estimated cost of the systems at the various SAR milestones, the dollar and percent of growth from each of these stages, and the cost estimate through program completion. There is also appended—appendix II—a schedule showing, by service, similar information on each of the 38 systems.

The explanatory reasons shown on the SAR's for cost growth were often voluminous in number and many of the SAR's did not relate any monetary value to the reasons given.

Chairman PROXMIRE. Why not?

Mr. KELLER. I beg your pardon?

Chairman PROXMIRE. Why not.

Mr. KELLER. We think they should, but the system did not show it. It is one of the things we are recommending be changed so that they can assign some dollars to these reasons where they possibly can.

Chairman PROXMIRE. Without that the report doesn't have any value, does it?

Mr. KELLER. I think it has a value, but I think without it you don't have the reasons for the cost growth or cost overrun, whatever you want to call them.

Chairman PROXMIRE. At least you don't have an understanding.

Mr. KELLER. That is right.

Chairman PROXMIRE. Explanation.

Mr. KELLER. Where dollars were identified, the reasons most frequently cited were inflation, capability increases, contract cost increases, quantity increases, and poor estimating of expected cost and program stretchouts.

Of particular significance is the effect quantity or capability increases or decreases have on costs over the life of a program. These often times do vary and do have significant impact on total program cost. A determination of cost growth should take into consideration changes in quantities and capability as well as changes in dollars.

COST-BENEFIT ANALYSIS

Chairman PROXMIRE. Let me ask you, does the Navy or do the Army or Air Force or the Defense Department have a system of cost-benefit analysis on which they would make decisions in some of these cases?

Mr. KELLER. I am sure they have in many cases.

Chairman PROXMIRE. Where they have them, where they crank in their original estimate, obviously they can come out with a factor that can show that it is beneficial to the defense of this country to go ahead with a weapons system. But if they had the true costs they would find in many cases it was not and it would seem——

Mr. KELLER. Cost-benefit studies have been made. I won't say all systems but certainly they have been made on many of the major systems in the past, and I think they are made at the present time when a question is up as to whether to continue the system or modify it.

Chairman PROXMIRE. It is made by the Office of Systems Analysis.

Mr. KELLER. That is my understanding, yes, sir, and I think there is some capability in the three military services.

GAO DEVELOPING CAPABILITY

Chairman PROXMIRE. Why shouldn't there be a capability in the GAO or the Congress to do this?

Mr. KELLER. As you know, Mr. Chairman, we are developing that capability with some success.

Chairman PROXMIRE. I think it is absolutely vital. I want to tell you why it is vital. I asked Secretary Laird for the systems analysis studies for the C–5A, whether or not it would be wise to go ahead with a fourth squadron last year, this last summer, and I had great trouble in getting it and Secretary Laird was right in being reluctant in giving it. We found, incidentally, his studies showed that the additional purchase of C–5A's could not be justified even though the Secretary of Defense decided to go ahead with it. He said, "If you take this and use it, this will destroy my Office of Systems Analysis because every time Systems Analysis shows that the system is not good

but the Secretary of Defense goes ahead and uses it or the Joint Chiefs recommend it be used, it means somebody in Congress is going to come up and get this and use it to overturn a decision by the Secretary or by the Joint Chiefs, and under those circumstances it would be very hard for us to get objective and accurate appraisals by our Systems Analysis Office."

He said, "Why don't you get a systems analysis office of your own," and I think he is right, I think he is right.

I would hope that you can move this along as rapidly as possible because then we would be in a much better position to know whether these weapons systems are accurate. We could take these cost estimates, we could use them very sensibly and say this system can and this system cannot be justified, they are not economically justifiable, and we would be in a much better position to proceed. I don't think analysis will give us final answers. You have to make your judgment based on military judgment, but it would be very helpful.

Mr. KELLER. As you know, Mr. Chairman, we have taken the position that we can and should develop an increased systems analysis capability to evaluate and present the studies that have been made and perhaps point out to Congress the alternatives or options that might be available. I think it should recognize that there are limitations that an independent office would have insofar as systems analysis work is concerned. That is, questions of military strategy and capability. I don't recommend we set up a separate corps of generals and admirals to take that on.

Chairman PROXMIRE. All right, sir; go ahead.

COSTS OMITTED FROM SAR'S

Mr. KELLER. Our analysis of the cost data presented in the SAR's disclosed numerous instances where costs or potential costs, which will or can impact on program costs, were not shown. Some of the costs which were omitted were not required in accordance with SAR instructions, while others did seem to us to fall within the purview of existing directives governing the preparation of the SAR.

Chairman PROXMIRE. This seems to me to be a very, very important qualification.

Mr. KELLER. We think it is, and I point out again we have discussed most of the problems we have mentioned here this morning with the Defense Department. We have every hope they are going to make the necessary corrections in the reporting system.

Chairman PROXMIRE. You say numerous instances where costs or potential costs will or can impact on program costs were not shown.

Mr. KELLER. Yes.

Chairman PROXMIRE. Can you give some examples?

B–1 (AMSA)

Mr. BELL. Yes. the $34 million on the 1052 program. On the B–1 program. the AMSA, the early developmental costs of $135 million were not included.

Chairman PROXMIRE. Why not?

Mr. BELL. It was just omitted. The instructions required that it be included but it was omitted.

Chairman PROXMIRE. What's their explanation of that?

Mr. BELL. I think the explanation, as I recall it, Mr. Chairman, was it simply was an error. It should have been included and that in subsequent SAR's it will be picked up.

Chairman PROXMIRE. How can they make an error of $135 million? This is a fantastic oversight. Is this intended to deceive the Congress and the public?

Mr. BELL. I did not so interpret it.

Chairman PROXMIRE. You say numerous instances. It would be one thing if they made an error even of that size once but when they make it, you say, frequently, it would seem to me that it is more than incompetence, it could be very well deliberate.

Mr. BELL. Mr. Chairman, there are a large number of individuals, people, involved in preparing these SAR's. Our system covered 57 systems. There were at least 57 program managers. Underneath those were large numbers of people.

There was some confusion and still is, I am sure, some confusion as to what exactly is required to be reported on the SAR in its cost data.

Chairman PROXMIRE. Will you provide these numerous examples, as many as you possibly can, for the record?

Mr. BELL. Yes, sir, we would be glad to do that.

(The data referred to follows:)

EXAMPLES OF COST DATA NOT SHOWN IN SAR'S AT JUNE 30, 1969

C-5A

Cost effect of contract incentive provisions are not estimated. The Air Force can incur up to $29.3 million in additional costs if Lockheed and General Electric are successful in achieving the performance incentives stated in the contracts. In addition, Lockheed may be liable for up to $11 million in liquidated damages if the first 16 aircraft are not delivered on schedule.

DE-1052

A pending claim of $97.8 million and post delivery and outfitting funds of $66 million.

SHILLELAGH

1. The SAR did not show missile production costs beyond fiscal year 1971, although the Army estimates an additional expenditure of about $63 million beyond FY 1971.
2. A recommended improvement program estimated to cost $95 million was not addressed in the SAR because it had not been formally approved.

F-111

Up-date charges for the F-111A/E/D estimate at $367 million were not included in the SAR.

AMSA (B-1)

Early R&D costs of $132.4 million were not reported.

CVAN-68-69

R&D costs incurred by AEC and Navy on the reactor plant core and propulsion plant are not included nor are major spare reactor components and AEC fissionable material. The estimated cost of items excluded is about $400 million.

SRAM

Nuclear warhead costs estimated at about $98 million were not reported on the SAR.

POSEIDON

Project definition costs of $28.5 million were not reported nor were the costs of nuclear warheads (the Navy informed us that the latter was not available). In addition, the cost to modify submarines to receive the Polaris which is estimated at one billion dollars was not reported and about one billion dollars estimated to be incurred by other agencies in support of the Fleet Ballistic Missile System has not been identified on the SAR.

MINUTEMAN II AND III

Nuclear warhead costs and construction costs were not addressed in the SAR and the costs of same were not made available to us during the review.

SAFEGUARD

Chairman PROXMIRE. How about the Safeguard system? We had a tremendous debate on that. It is probably the most controversial and widely debated and discussed system. The planning estimate is $4.185 billion, the contract definition is $4.185 billion, the initial planning cost or contract definition adjusted for change in quantities is $4.185 billion, and the current estimate is $4.185 billion. Why is there no change at all in this program, none?

Mr. BELL. In the definition of this program, Mr. Chairman——

Chairman PROXMIRE. The understanding is it has grown very rapidly.

Mr. BELL. (continuing). The estimate for the Safeguard is the estimate that was prepared in March of 1969 and it hasn't—we are talking about a span here of only 3 months. The costs on the Safeguard report exclude the prior costs of Sentinel and any predecessor programs.

Chairman PROXMIRE. You say it excluded.

Mr. BELL. Yes, sir.

Chairman PROXMIRE. Excluded the costs, why?

Mr. RUBIN. The cost figures here are based on the estimate made in March 1969. These figures include the Sentinel but because of the fact that the program was actually authorized as the Safeguard in March 1969, the opening figure used at that time was the figure then presented which includes much of the hardware in the Sentinel program, Nike X program, all of which preceded it.

Chairman PROXMIRE. My point is when you put this in a table and report on the overruns, the growth in costs, obviously what you are doing here is just taking original authorization and just repeating it, and it is a $4 billion program, the result is you get an overall, it would seem to me an overall, distortion. The programs that are dynamic on which you have up-to-date information, the programs on which you have had some experience obviously there is a substantial amount of growth. You throw in a few of these very big programs where you don't have any experience you bring down the overall overrun percentage substantially, is that correct?

Mr. KELLER. That is correct. It is possible that there is going to be an increase of the Safeguard.

Chairman PROXMIRE. This was debated on the floor of the Senate, $8 to $10 billion, one Senator said $20 billion and one Senator said far more than that. But an $8 to $10 billion program is the general figure accepted by those on both sides of the program, the ABM.

Mr. BELL. Well, it is important, I think, to remember that the SAR data as of June 30 represents only the program that was approved at that point in time. It does not attempt to consider expansions in the program that may be under consideration but have not yet been approved.

NUCLEAR WARHEADS EXCLUDED FROM ALL SAR'S

Chairman PROXMIRE. Does your figure include the warheads?

Mr. BELL. No, it does not include the warheads.

Mr. KELLER. No.

Chairman PROXMIRE. Why not?

Mr. BELL. The estimated cost of nuclear warheads is excluded from all SAR's by Department of Defense decision.

Chairman PROXMIRE. So here is another problem that may result in an understatement of the costs, would result in an understatement of the costs.

Mr. BELL. Yes.

Chairman PROXMIRE. And we don't know what effect it would have on overruns.

Mr. BELL. No, we do not.

Chairman PROXMIRE. All right, sir, will you go ahead.

SCHEDULE SLIPPAGE TOTALS

Mr. KELLER. Our analysis of the slippages in the system time schedules as reported on the 57 SAR's we reviewed showed that 34 of the systems either had experienced or there were anticipated slippages of from 6 months to more than 3 years from the originally established program schedules, although in many cases the initial operational capability date had not changed. Eleven of the systems were in the early phase of the acquisition process and therefore no schedule slippages were reported. For the remaining 12 systems, either no slippage or slippage of less than 6 months was reported.

Chairman PROXMIRE. So that 11 of those systems you would discount and leave out. Therefore, about two-thirds of the systems that experienced slippages of from 6 months to 3 years, delays of 6 months to 3 years in their schedules, of those that were appropriate, you have 11 out of both sides of the equation.

Mr. KELLER. Yes.

Chairman PROXMIRE. I say more than two-thirds, the staff says it will be close to 75 percent but it is a very large proportion that have these big delays.

Mr. KELLER. If I may proceed, Mr. Chairman, over 30 different reasons were cited on the SAR's to explain the schedule slippages. Those most frequently cited were development problems, funding problems, system design changes, production problems, contract changes, and overly optimistic original schedule estimates. Other reasons cited included delays in associated programs, strikes at contractor plants,

problems arising from the Southeast Asia conflict, and late availability of Government- or contractor-furnished equipment.

Chairman PROXMIRE. How many of these were strikes in contractor's plants?

Mr. BELL. I think there were two.

Chairman PROXMIRE. Two.

Mr. BELL. Yes.

Mr. KELLER. Explanations of schedule slippage provided on several SAR's were often brief and, in many instances, did not indicate sufficient information to show the basic cause for the slippage.

Chairman PROXMIRE. Why not? There just seems to me to be no excuse for that.

Mr. KELLER. We think it should, Mr. Chairman. We were attempting to evaluate the system as we saw it and we are also trying to get corrections in it.

PERFORMANCE VARIANCES

Concerning system performance, we found that the SAR's showed significant variances between the performance expected originally and that currently estimated for many of the systems we reviewed. In some instances, the variances represented improvements in the system performance while in others a degradation in performance of the system had occurred or was expected. Still in others, trade-offs in technical characteristics had occurred which resulted in improved performance in some aspects of the system and degraded performance in others.

Chairman PROXMIRE. Which was most frequent, degradation or improvement?

Mr. KELLER. Do you have any reaction on that, Mr. Bell?

Mr. BELL. No, I don't remember. I have something in the back of my mind that it is about a 50–50 trade-off.

Chairman PROXMIRE. It is surprising, it is the first one of these elements where you have anything like that. Costs are going up, delays are increasing, they are not moving ahead of time, they are consistently increasing their costs, but you say as far as performance is concerned there is about a 50–50 trade-off. Do you say that with assurance?

Mr. BELL. I would like to check that.

Chairman PROXMIRE. Would you check it for the record, because I think degradation can be just as significant as cost increase and we ought to know about it. I know it is very hard to measure in objective terms as we can with dollars and cents on costs but we would like to know that.

You say there were two strikes. How much of a cost increase was involved?

Mr. BELL. I don't believe we have the dollars associated with that.

Chairman PROXMIRE. Do you have the length of the delay?

Mr. BELL. Sir?

Chairman PROXMIRE. Length of delay in those cases.

Mr. BELL. I am not sure we have that either.

Chairman PROXMIRE. May I get that for the record?

Mr. BELL. The explanations on the SAR's or the reasons for these things were strikes in two instances.

Chairman PROXMIRE. All right. I would like to get it for the record if I can.

(The information referred to follows:)

SUPPLEMENTAL DATA ON SYSTEM PERFORMANCE

We have attempted to categorize the various reasons for the significant performance variances and we find they fall under three principal headings, namely (1) desire to upgrade performance and reliability as technological advancements are recognized, (2) inaccurate or overly optimistic estimates or expected performance and (3) changed design to increase capability and/or correct deficiencies.

The 57 SAR's in our review can be generally placed in the following categories:

Variances from original plan	*Number of systems*
Improvement	3
Degradation in system performance	12
Both improvement and degradation	17
No significant variances	25

Three of the systems we looked at experienced significant improvements in performance beyond original expectations. These improvements were attributed to breakthroughs in technology during the acquisition process. As these technological advancements were recognized, they were incorporated into the systems.

However, we also found that 12 of the systems included in our review had experienced or expected a degradation of system performance from that originally estimated. However, this information was not always properly identified on the SAR reports.

In the improvement and degradation category we found that 17 systems realized improvements to some performance characteristics and at the same time experienced degradation to other characteristics. Our analyses of the SAR disclosed that these performance changes in capabilities were generally made to increase the overall capability of the system over that initially planned, or to correct recognized deficiencies to keep the system from falling below desirable performance capabilities.

No significant performance variances were reported on the SAR nor will we identify any variances in our review for 25 systems.

SCHEDULE SLIPPAGE DUE TO STRIKES

Strikes at contractor plants were cited in the SAR on only one program as contributing to schedule slippage. In this case, the SSN–637 Class attack submarine program, the SAR indicated that strikes, among numerous other reasons, were responsible for program delays. However, the SAR did not indicate the length of the strikes or the extent of delay attributable to the strikes.

Our review of other documentation on the Sparrow F program showed that a 3 month strike had occurred at the prime contractor's plant. While several other reasons were cited, no mention of this strike was made on the SAR as contributing to the schedule slippage the system experienced.

Chairman PROXMIRE. Go ahead, Mr. Keller.

Mr. KELLER. Reasons cited for the differences were many and varied. Some were common among several systems, while others were unique to a particular system. Some of the principal reasons cited included (1) inability to meet technical design specifications, (2) technical objectives beyond the state of the art, (3) inaccurate or overly optimistic estimates of expected performance, (4) improved design to increase capability, and (5) desire to upgrade performance and reliability.

Chairman PROXMIRE. In the SAR itself there is no figure for the contract price on each program. Why is that?

Mr. KELLER. There is no figure for what, Mr. Chairman?

Chairman PROXMIRE. For the contract price of any program.

Mr. KELLER. That could be included in the contract definition figure. But other costs are included.

Chairman PROXMIRE. Are you telling us that they are the same, the contract price and the contract definition are the same?

Mr. BELL. No, sir, it is not the same.

Chairman PROXMIRE. It is not the same.

Mr. BELL. It isn't the same. In one of the programs I looked at last week the amount of the prime contract was only five-twelfths of the cost of the program. The other seven-twelfths of the costs of the program were represented by other types of costs and perhaps even contracts with different contractors to supply certain types of equipment.

Chairman PROXMIRE. So the contract, what do you use, contract definition is that what you call it?

Mr. BELL. Contract definition is their term.

Chairman PROXMIRE. The contract price is only a fraction of your total contract definition.

CONTRACT DEFINITION

Mr. BELL. Contract definition, Mr. Chairman, is a kind of state of mind. It is a point in time in which the managers feel they have worked out a good number of the technical bugs, they have a pretty firm idea of what it is they want to build and how many they want and are now ready to start to negotiate a contract or a series of contracts to get them.

Chairman PROXMIRE. What's the difference between that and the contract price? Tell us what this very large proportion is that is not part of the contract price but is part of contract definition, you said about five-twelfths.

Mr. BELL. In one particular contract. Associating contract price with contract definition is something I have difficulty doing. Contract definition is a point in time in which they are ready to proceed on a certain program.

Chairman PROXMIRE. It includes the contract price?

Mr. BELL. Not yet.

Chairman PROXMIRE. What other elements?

Mr. BELL. At this point in time they are ready to start to negotiate a price with a contractor or with a group of contractors, and the price that they eventually negotiate may be quite different from the price that they have established.

Chairman PROXMIRE. It could be more?

Mr. BELL. It could be more, it could be less. You will notice in our schedule a couple of Navy programs they have excluded the current estimate total program.

Chairman PROXMIRE. Why not use the contract price for the whole program?

Mr. KELLER. Well, there are many costs over and above the contract.

Mr. BELL. Right.

Chairman PROXMIRE. Many costs in addition to the contract cost, such as the cost over 5 years such as you gave us in the rescue vehicle.

Mr. KELLER. Yes.

Chairman PROXMIRE. Now I would like to ask some questions about your statement on major systems acquisitions. What you have done

so far is to review the figures supplied by the Department of Defense in their selected acquisition reports, the SAR's. What I would like to know is whether GAO intends to review the weapons programs themselves or whether it will be satisfied with reviewing the Pentagon's figures?

GAO Plans Selective Weapons Studies

Mr. Keller. What we plan to do in the next phase, Mr. Chairman, is to go back and try to figure out the causes, the reasons for these overruns, going behind the reasons shown on the SAR. This work will be done both at the Pentagon and the contractors' plants.

Chairman Proxmire. Will you do it on the 50 systems?

Mr. Keller. I don't think we will include all 50, but we will include the most important ones.

Chairman Proxmire. You will include what?

Mr. Keller. We will include, at least in our judgment, the most significant or the most important.

Chairman Proxmire. How long will that take?

Mr. Bell. We are shooting for a completion date of fieldwork on that effort sometime the middle of February, first of March.

Chairman Proxmire. That is encouraging. When will you have a report for us?

Mr. Bell. I think I would like to reserve a couple of months at least for that. There are so many——

Chairman Proxmire. Some time in late spring.

Mr. Bell. April, May, yes.

CLASSIFICATION PROBLEM

Chairman Proxmire. You stated that your reports on more than 50 major individual systems will be made available to Congress on a classified basis. Why should these reports be classified?

Mr. Keller. That is the matter we discussed earlier, Mr. Chairman. We are going to make every effort to get them declassified; I am not sure we are going to.

Chairman Proxmire. What is classified about the cost history and cost overruns of weapons programs?

Mr. Keller. Cost figures alone are not classified like the appendix we have in the statement today, appendixes I and II. Some of these backup individual reports are going to deal with numbers and with specification and that is where we will run into the classification problem.

Chairman Proxmire. Who told you they are classified, the Defense Department?

Mr. Keller. The material we have put together at the present time is from classified documents that were available to us. Mr. Bell, you can answer this, have these individual reports been sent to the Defense Department for declassification purposes?

Mr. Bell. We have been running these reports by the security people for the last several days to see what portions of them they will be willing to declassify.

Chairman Proxmire. Well, I bring it up again because I just want to reemphasize it. Go right ahead.

Mr. KELLER. The next subject, Mr. Chairman, I would like to discuss briefly——

COST OVERRUNS TOTAL $21 BILLION

Chairman PROXMIRE. Let me ask you before you go ahead, Secretary Laird reported cost overruns of $16.6 billion to the House Appropriations Committee in November. You report almost $21 billion in overruns. How do you explain the difference? Has there been that much of an increase since Secretary Laird appeared in November or are you working with different figures?

Mr. BELL. Would you like me to answer that?

Mr. KELLER. Yes.

Mr. BELL. Mr. Laird reported on only 35 systems.

Chairman PROXMIRE. I see.

Mr. BELL. Ours is on a larger universe. There also were some differences in time frames. We used exclusively June 30 figures. Some of the information Mr. Laird made available was based on later data.

Chairman PROXMIRE. The main reason is because he used 35 systems and you have 50 systems, is that correct?

Mr. BELL. That is the primary reason.

Chairman PROXMIRE. He has a $16 billion and you have a $21 billion.

Mr. BELL. Yes.

Chairman PROXMIRE. It would seem very likely it would be considerably more than this if you could have a completely universal report because you don't maintain these 50 major weapons systems which constitute the entire picture of cost overruns.

Mr. BELL. No, we do not.

Chairman PROXMIRE. If you filled in the blanks it would be higher still.

Mr. KELLER. It could be.

Chairman PROXMIRE. OK.

SHOULD-COST STUDY

Mr. KELLER. Next, Mr. Chairman, I would like to turn to a study we are making on the "should cost" concept.

If you will recall in your subcommittee report last May you recommended that the GAO study the feasibility of incorporating into its audit review of Government contracting the "should cost" method of estimating contractor cost. You will find further details on the results of our study to date, attached to my statement, as appendix III. But briefly, Mr. Chairman, we find that the use of the "should cost" concept is one that is not unusual in the industrial world and we certainly think that there is room for considerably greater application of it in Government procurement.

USES OF SHOULD COST

We believe that "should cost" has two very important uses at particular times:

1. At the time of negotiation of the contract and contract modification; and

2. At the time of a post audit.

We think the "should cost" concept would probably serve as a most important factor in the time or preliminary to negotiation of the contract. We think a "should cost" review can be very effective in assisting a Government negotiator in achieving a fair and reasonable contract price if it is performed prior to the contract award.

We believe that the Department of Defense and civil agencies of the Government can be more effective in their preparation for negotiations with a contractor. Such preparation should include (1) a realistic estimate of what the desired item should cost, and (2) a concerted team effort, using "should cost" concepts, to evaluate the contractor's proposal.

The Department of Defense should also consider the use of postaward "should cost" reviews. Such reviews of major procurements on a postaward basis could provide management with valuable data on (*a*) the contractor's performance and cost consciousness, and (*b*) the adequacy of the Government's prenegotiation reviews.

We have also looked into it as recommended by the subcommittee for our own use. I would point out first, Mr. Chairman, that we have used the "should cost" concept to some extent in our Government pricing work or defense contract pricing work in that we have made studies on make-or-buy decisions, utilization of equipment, and so forth, which is a part of the "should cost" technique.

Will Encourage DOD To Use Should Cost

We propose to try to encourage DOD to use this concept to a greater extent. In additon we in GAO will broaden our base for use of this type of technique in audit work and make some selected reviews on a "should cost" basis to provide additional data on the feasibility of the reviews. In this connection, some added skills will be required. Upon completion of these selected reviews, we will decide whether a continuing "should cost" capability is warranted.

I want to point out one thing which I think might be a problem. Our studies have shown so far that to make a "should cost" technique actually work as it is working in some areas of private industry there has to be a close working relationship and cooperation between the Government and the contractor.

The Federal Government has followed a policy in recent years of disengagement from the contractor, letting the contractor proceed on his own, on his own risks and with less interference by the Government. However, with a "should cost" concept we think there would have to be a very close working relationship and a complete disclosure on both sides. In other words, a team effort to try to bring about an agreement as to what the product should cost in fairness to everybody concerned.

I point this out, Mr. Chairman, because we have not always had that cooperation in the past but I think it is a very key factor if we are to make this work. We certainly think it is worthwhile and we are going to take a real hard look.

Chairman Proxmire. We are glad to hear that. I feel very enthusiastic about this "should cost" concept. As I understand it your experts in

the Defense Department, your procurement experts, your specific experts with particular weapons systems, work out with the contractor precisely what the cost should be at various stages of production, and this "should cost" schedule can be used as kind of a guide and a comparison to see the extent to which you are going above it or where you are making your mistakes, where the slippages are, focus on them and make corrections.

Mr. KELLER. That is correct, Mr. Chairman. But getting behind those figures, of course, there would have to be studies of labor required, and so forth——

Chairman PROXMIRE. I am sure it requires a great deal of study.

Mr. KELLER. Make-or-buy decisions and many other factors go into it. However, we think it is very worthwhile and certainly it has been proven to work in private industry, apparently quite successfully.

Chairman PROXMIRE. You see what concerns me is this, I am glad to see you feel it can be very effective in having the Government secure a fair and reasonable contract price. However, you specify this should be done prior to the award of the contract. Why do you limit this "should cost" during this period of time? Are you aware of the Pratt & Whitney study conducted while the program was in production and this accounted for its success?

Mr. KELLER. Yes, sir, I am aware of it and certainly of the hearings held by your subcommittee this year, but as I recall, that while the contract was in production for the engines, the final price had not been negotiated, and we think the time to get the good price is at the time of negotiation and not come along later and try to get price adjustments, not that past "should cost" studies are not to be used at all.

Chairman PROXMIRE. Why not use both? There are a large proportion of cases, where you can't get your price in advance.

Mr. KELLER. I would use both but I would put the primary emphasis at the time of the negotiation of the contract or a modification of the contract——

Chairman PROXMIRE. It seems to me the study would be far better, more effective, if it is made during the production process, and then it is based on the realistic facts as they develop and then you have a real basis of appraising your efficiency.

Mr. KELLER. Perhaps it can be a combination of many things, but what I am trying to say is, and I hope I can make it clear. I don't think we should rely, wholly, on the Government coming in later on, after the contract is well along or probably complete, and saying what it should have cost to do the job because you probably will end up in a lawsuit, something like that, trying to get your money back.

I would rather see an adjustment made at an earlier time if one is due.

Chairman PROXMIRE. In your statement you say the GAO will monitor the Pentagon's "should cost" reviews. But the problem has been that the Pentagon refuses to employ this approach, which was, as you pointed out, so successful in the Pratt and Whitney case. What will GAO monitor if the Pentagon refuses to use this method of analyzing efficiency and costs in contractors' plants?

Army Interested in "Should Cost"

Mr. Keller. Well, we are hoping, Mr. Chairman, DOD will make greater use of it. I believe there are hopeful signs in the Army, is that correct, Mr. Grosshans?

Mr. Grosshans. Yes, sir, the Army is showing interest. Under Secretary Fox has been looking into this matter and they are currently thinking about providing some capability along this line.

Chairman Proxmire. I would like to turn for a minute to appendix III of your statement to the "should cost" concept. I think some of the most valuable material is in this appendix of your statement and I hope it is not overlooked by the press and public because it is an appendix.

CONTRACTOR REACTION

In appendix III of your statement you say that you discussed the "should cost" approach with Pentagon contractors, as well as other representatives from industry. What did the contractors have to say?

Mr. Keller. I would like Mr. Grosshans to answer that, who has made the particular study.

Mr. Grosshans. Essentially to answer this in summary form, most of the contractors we talked to actually seemed to show some receptiveness to this. I think there was one case where they felt it could not be applied, but generally there seemed to be some receptiveness to this. The big question seemed to be one of how it would be staffed, how it would be applied, and what use would be made of the data. I think this is the major question that has come up. In other words——

Chairman Proxmire. In general you find a favorable disposition to it.

Mr. Grosshans. Correct.

Chairman Proxmire. There is one case at least where they said it wouldn't be practicable, they couldn't do it, but in most cases they seemed to be openminded in favor.

Mr. Grosshans. Yes, at this point.

As Mr. Keller pointed out, it would be interesting to see, once we performed some of these reviews to what extent we would run into problems in obtaining all data necessary. But they feel, most of those contractors we talked to feel, there could be benefits derived from such a review, in their other work.

Pratt & Whitney Study

Chairman Proxmire. Can you give us a quick brief summary of the Pratt & Whitney study, what that showed?

Mr. Grosshans. Yes, sir. Basically, Mr. Rule, as you know, was conducting that particular review at Pratt & Whitney. The reason for the review being conducted, there were several of them, the major one being one of cost growth or whatever you want to call it. In the initial contract award in 1961, the estimates for the engines totaled about $270,000 per engine. By 1967 this cost had increased to about $700,000 per engine. DOD was quite concerned about this increase as well as the type of contracting procedures applied at Pratt &

Whitney, and as a result a consulting firm was engaged to go in there and review the reasons for these large increases. Their report was issued and they came up with a so-called "should cost" figure which was substantially below the $700,000 estimate at that particular time.

The Navy had some reluctance to use this data because apparently it felt that their position could not be sustained based on the data furnished by this consulting firm. Consequently, the Navy was directed to assemble its own teams to go into Pratt & Whitney and make this review.

A total of about 11 months elapsed after initial contact by the special Navy team and in June of 1968—yes, I think it was June 1968—the contract was definitized for the 2,053 engines that were involved. The team effort involved about 40-plus people that were specially selected to do this particular review. As I mentioned the contract was successfully negotiated.

Mr. Chairman, in this particular case there was a letter contract in existence for the rather sizeable quantity and part of the deliveries already had been made. In other words, at the time that the contract was definitized in 1968 the 1967 deliveries as well as part of the 1968 deliveries had been completed. The total contract covered the period 1967 through 1970.

Chairman PROXMIRE. So, in general your conclusion was that the "should cost" study in this case was desirable, saved money.

Mr. GROSSHANS. Mr. Rule testified to this effect. He felt that there was, he felt, about $100 million that could be identified as savings as a result of this effort.

Chairman PROXMIRE. As a result of this "should cost," $100 million.

Mr. GROSSHANS. There have been cancellations as you well know in the F–111 program so this $100 million will be substantially reduced due to the termination claims which are pending.

Chairman PROXMIRE. But anyway in this case it was somewhat different, as you say, a private consulting firm had gone into this under a Government contract and they came up with conclusions similar to the Navy study.

Mr. GROSSHANS. Yes, sir.

Chairman PROXMIRE. You specified that?

Mr. GROSSHANS. Right.

Chairman PROXMIRE. The name of that firm was the Performance Technology Corp.

Mr. GROSSHANS. Correct.

Chairman PROXMIRE. The Navy study followed the private study and corroborated its findings, right?

Mr. GROSSHANS. Yes, sir.

Chairman PROXMIRE. Now it seems to me that one of the critical elements of the Pratt and Whitney study was the fact that there was a private analysis preceding the Government's and that there was thus a degree of independence of the Pentagon in studying the Pratt and Whitney plant.

What are your views on the role of the private consultant firm in the "should cost" approach?

Mr. GROSSHANS. We are currently thinking of utilizing consultants in this next phase that Mr. Keller spoke of. In other words, we will make selective reviews. We believe there is a place for consultants to

be used in connection with this. They can provide certain expertise and assist us in this review. I think the Army is also currently looking into this possibility and I know they have discussed this with certain of the consulting firms.

Council of Defense & Space Industry Association (CODSIA)

Chairman Proxmire. You also talked with the Council of Defense and Space Industry Association known as CODSIA.

Mr. Grosshans. We did.

Chairman Proxmire. What is this association and why did you consult with them?

Mr. Grosshans. Basically the council is a consolidation of all of the industries of the aerospace, electronics, as well as automotive and some of the other industries. The reason we discussed this with them, we wanted to get an early exposure to the possible problems we might run into in evaluating the feasibility of these reviews. We wanted to get the pros and cons from them as to what their feelings might be, if the Government, GAO, or DOD would actually conduct some of these particular studies.

Chairman Proxmire. What was their reaction?

CODSIA Reluctant To Participate

Mr. Grosshans. I think in general somewhat reluctant to participate in this type of study. Although there were some indications that some good could come of it.

I think the big concern they expressed, and I would like to bring that out because it might otherwise give the wrong impression, was that if this became a requirement the "should cost" reviews would be applied everywhere, even possibly on some of the contracts where adequate competition may have been present. They felt there might be a misuse of the concept. I think generally other than that there seemed to be some receptivity to this.

Navy Plans No Continuing "Should-Cost" Capability

Chairman Proxmire. In view of the fact the contractors approve it and your finding was in this case it worked fairly well, it seems to me, that in your statement, Mr. Keller, you make a very disturbing statement and I am talking about appendix III, you say that the Navy does not plan to provide a continuing capability or to perform extensive reviews of the type performed by Mr. Rule in the Pratt and Whitney case. How do you explain this attitude on the part of the Navy? I would think that after the good results of the first study, they would want to repeat it. Why are they against it?

Mr. Keller. I really can't explain their position on this. I think perhaps that it should only be used on a limited basis and I have no quarrel with this. I dont' think you can use this in every case or that you should.

Do you have anything to add to that?

Mr. Grosshans. Yes, I think Mr. Rule testified in this regard and his opinion was (1) he would not like to be involved in another ef-

fort of this sort, and (2) he felt it should only be used as a last resort. He did not feel it should be used as a regular tool.

Chairman PROXMIRE. Anything that saves $100 million even though the subsequent developments indicate one might have to reduce that saving it seems to me is well worth encouraging, although I can understand, although there is some discomfort and difficulty on the part of the administrators involved. Mr. Rule will be here tomorrow and we will talk to him.

Mr. GROSSHANS. I understand.

TRENDS IN MILITARY PROCUREMENT

Chairman PROXMIRE. Go right ahead, Mr. Keller.

Mr. KELLER. You asked us, Mr. Chairman, to furnish figures on trends in military procurement.

During the fiscal year 1969 total military procurement, excluding intragovernmental orders, amounted to $40.7 billion. This represent a decrease of about $2 billion below the level of the previous year.

Department of Defense statistics of the 8-year period ended June 30, 1969, show that of the procurement dollar, formally advertised a procurement averaged about 13 percent; price competitive negotiation about 31 percent; and single-source procurement, including noncompetitive follow-on after price competition and design, technical or other competition, about 56 percent. The statistics reflect a trend toward increased use of competitive procurement under both advertised and negotiated procedures from 1963 to 1966. However, since 1966 there has been a progressive decline in the use of these two methods of procurement. For instance, formally advertised procurement during fiscal year 1969 was 11 percent, down from 17.6 percent in 1965 and from 11.5 percent in 1968. DOD believes that much of this is due to the conflict in Southeast Asia.

We have included as appendix IV, Mr. Chairman, a summary of the changes by year in all three areas for the fiscal year 1962 through 1969.

ADVERTISED COMPETITIVE BIDDING

Chairman PROXMIRE. There is a very disturbing and unfortunate decline in advertised competitive bidding from 17.6 percent to 11.5 percent, down to 11 percent. Congress has indicated that is the greatly preferred system of procurement and yet you have had this departure.

The only solid reason given is the conflict in Southeast Asia, which after all, accounts for part of the procurement but nothing like most of it, does it? After all we are buying our aircraft carriers or most of our big weapons systems, our Safeguards, and so forth, independently of Vietnam; we are not buying most of our missiles because of Vietnam; it is hard for me to understand how they can blithely say this catastrophic drop is because of the Vietnam war.

At any rate, if this is true, we should have a sharp increase in the percentage which is competitively procured in the coming year inasmuch as Secretary Laird has told us that whereas in 1969 we were spending about $30 billion in Vietnam, by the beginning of 1971 fiscal year, that is July 1970, we will be spending only $17 billion annual rate in Vietnam. Under those circumstances it is a much smaller pro-

portion of our total military expenditures and we would think you would expect the competitive procurement to increase sharply, is that a fair conclusion?

Mr. KELLER. I think that is a fair conclusion. I have not seen a breakout of the procurements that were actually for Vietnam. I have heard the argument used they don't have time to advertise, many of these procurements have to move very rapidly which is probably one of the explanations for the increase in sole source negotiations.

Chairman PROXMIRE. How does this compare with our percentage advertised competitiveness in Korea?

Mr. KELLER. I don't have it with me.

Chairman PROXMIRE. Has this 11 percent, has it ever been lower than that competitively procured?

Mr. HAMMOND. I believe during World War II it was much lower, it was very little.

Chairman PROXMIRE. World War II. I would say in the last 20 years.

Mr. HAMMOND. But I don't have the information on Korea right now. We can get it.

Chairman PROXMIRE. I would like to see that. Because I think it is an alarming figure and we should be concerned about it.

Mr. KELLER. It certainly has dropped off.

(The following information was supplied for the record by the GAO:)

The Department of Defense did not begin to maintain statistics on the percentage of formally advertised procurements until fiscal year 1954. The total procurement since fiscal year 1954, as reported by DOD, and the percentage which was formally advertised, is shown below.

Fiscal year	Total procurement (billions)[1]	Formally advertised (percent)	Fiscal year	Total procurement (billions)[1]	Formally advertised (percent)
1954	$12.9	14.2	1962	28.1	12.6
1955	16.0	15.0	1963	29.0	12.7
1956	19.2	15.1	1964	28.2	14.4
1957	21.0	16.3	1965	27.4	17.6
1958	23.7	13.9	1966	37.2	14.2
1959	24.6	13.3	1967	43.4	13.4
1960	22.9	13.8	1968	42.7	11.5
1961	24.7	11.9	1969	40.7	11.0

[1] Excludes intragovernmental.

Chairman PROXMIRE. Do you think the Pentagon is doing all it can to encourage competition or is it stifling and driving small business out of the procurement picture?

SMALL BUSINESS

Mr. KELLER. The figures we have developed, Mr. Chairman, on small business——

Chairman PROXMIRE. Small business always gets a very large share of competitive procurement but a very small share in negotiated.

Mr. KELLER. We have set this out in appendix V to the statement. Our prime contract awards, it was high in 1967 at $8 billion, dropped off to $7 billion in 1968, and $6.5 billion in 1969. The fiscal year 1968

decrease in awards to the small business firms was largely concentrated in miscellaneous hard goods. The 1969 decrease in awards to small business firms was also heavily concentrated in miscellaneous hard goods and in clothing and textiles.

However, some of the subcontract work, according to the Defense Department figures, has increased, showing an overall percentage of business, defense business, to small business. Beginning in 1964, 31 percent; 1965, 33 percent; 1966, 36 percent; 1967, 37 percent; 1968, 34 percent.

Chairman PROXMIRE. Well, that table is available, that is appendix V of your statement.

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. Why do you, you seem to be leaving something out of these figures in prime contractors awards is the total figure in the second column?

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. You have $39.5 billion in 1967; $38.8 billion in 1968; and $37.3 billion in 1969. Our figures that the staff gives me are approximately $45 billion in 1967; $44 billion in 1968; and $40 billion in 1969. Apparently you are leaving something out. What are you leaving out?

Your figure in your statement is $40.7 billion for fiscal year 1969.

Mr. KELLER. That is right.

Chairman PROXMIRE. Well, just explain that for the record.

Mr. KELLER. All right, sir.

(The information referred to follows:)

The figures used by the General Accounting Office did not include awards to educational and non-profit organizations or to firms outside the United States whereas the figures available to the Subcommittee did include these amounts. A reconciliation of these differences for 1969 military procurement is as follows:

	Millions
Appendix V shows for prime contract awards to U.S. firms	$37,331
Awards to educational and non-profit	760
Awards to firms outside United States	2,676
Total military procurement	40,767

Chairman PROXMIRE. OK.

CONTRACT PRICING REVIEWS

Mr. KELLER. The next subject, Mr. Chairman, is contract pricing, where we have been placing a great deal of effort.

Subsequent to the issuance of Defense Procurement Circular No. 57, in November 1967, we have conducted contract pricing reviews at 156 contractor locations involving contracts amounting to about $2.6 billion. The contract pricing reviews we made fall generally into three categories:

Reviews of negotiated prices of contracts where proposals were solicited prior to the publication in November 1967, of Defense Procurement Circular No. 57;

Similar reviews where proposals were solicited after publication of the circular; and

Reviews of Department of Defense procedures and practices having a general impact on contract pricing.

The first case I would like to discuss is a review we made of prices negotiated for 34 procurements awarded during the calendar years 1965, 1966, and 1967, by the Department of the Navy to six different contractors for the production of 250-pound and 500-pound general purpose bomb bodies under firm fixed-price contracts having a value of about $343 million. Award of these contracts predated the issuance of Defense Procurement Circular No. 57 in November 1967, which as you know, provided for improvement in contracting procedures.

We found that (1) the prices for 33 procurements totaling about $309 million were higher by about $13.9 million than indicated by cost or pricing data available to the contractors prior to each of the negotiations, (2) prices negotiated for 12 procurements amounting to about $172 million included cost estimates of about $46 million for which sound and realistic cost or pricing data were not available, and (3) Navy contracting officials either had not requested preaward audits for eight of the 34 procurements or, where requested, the Navy imposed time restrictions which limited the scope of the audits.

In our opinion the prices for the bomb bodies could have been significantly reduced if the Navy had required the contractors to submit or identify in writing accurate, complete, and current cost or pricing data in support of cost estimates in price proposals, and had made adequate reviews and evaluations of the factual data available to the contractors in support of these estimates. Furthermore, for certain of these procurements, time limitations, and the absence of realistic cost data precluded adequate documentation of the contractors' proposals and agency audits. We believe further, there is a real question as to whether firm fixed-price type contracts should have been used rather in this type of case where sound and realistic cost or pricing data were not available for such a large proportion of the total prices.

We recommend that the Department of Navy consider our findings, as well as any additional information available, to determine the extent of the Government's legal entitlement to price adjustments with respect to these procurements. The Navy concurred with our proposal and initiated actions necessary to effect price adjustments under the contracts. In regard to the use of firm fixed-price contracts, the Navy advised that at the time of the awards there was an emphasis by Department of Defense officials on the use of firm fixed-price contracts to the maximum extent possible and an over-zealous application by contracting officials of this policy. The Department of Defense has recognized this over-reaction and has issued instructions concerning the misuse of firm fixed-price contracts.

Chairman PROXMIRE. How about that? That really shocks and surprises me, and I think it perhaps did you, too.

Mr. KELLER. Well, yes, sir.

Chairman PROXMIRE. The firm fixed-price contract is a contract which is determined in advance, and the contractor has to stick to it. He may lose money but the Government knows how much it is going to cost. It is the contracts that are—that provide for increased costs to the Federal Government as they develop and go along and the cost overruns charged to the taxpayer that we are concerned about. The zealousness of the procurement official who works hard to hold down

defense spending by trying to get firm fixed-price contracts it seems to me is something that ought to be encouraged, shouldn't it?

Mr. KELLER. In this particular case, Mr. Chairman, we think that it was a mistake to insist on firm fixed-price contracts because they didn't have prior cost experience that was reliable, and some of the specifications weren't completely worked out.

Chairman PROXMIRE. Was the firm fixed price a firm fixed price or was it made of rubber, did it expand?

Mr. KELLER. I don't believe it expanded.

Mr. HAMMOND. These are firm fixed-price contracts only subject to adjustments by change order. They were firm fixed prices.

Chairman PROXMIRE. They were firm fixed prices. Do you think they were a mistake from the standpoint of the contractors?

Mr. KELLER. Not the way it worked out in these particular cases, Mr. Chairman. It may not have been best from the Government's standpoint. I think there are a number of cases in recent years where due to the emphasis on firm fixed-price contracting as distinguished from some other type that it really doesn't make much sense to use the firm fixed-price type. You have to have the ingredients to make up a good firm fixed-price contract and in a number of cases those ingredients are missing.

Chairman PROXMIRE. Let me do something a little unorthodox here to speed up. You have been most patient and most responsive and I am delaying you and I would like to move ahead. Your entire statement and the appendixes will be put in the record at the end of your oral statement (p. 54.)

Mr. KELLER. All right, sir.

Chairman PROXMIRE. Where you say "contractors are presently, for the most part, certifying that all types of cost data submitted by them are current right up to the date of agreement on price." Does this mean that no real effort is made to determine what is current and what is not? They just, all of their costs they say are current, just automatically?

Mr. HAMMOND. They are expected to certify that the data are current up to the date of negotiations, and we feel in some cases, it may be desirable to have a reasonable cut-off date for some of the smaller elements of costs, overhead items, but for the significant elements of costs it probably should be up to the actual cut-off date of negotiation.

Chairman PROXMIRE. I want to make sure I understand what you are saying. Are you saying when they certify this they are not giving the truth, the facts, they are not accurate?

Mr. KELLER. We wonder, Mr. Chairman, how realistic you can be when you bring it right up to yesterday, for example.

Chairman Proxmire. That is the point I wanted to be sure I understood, that they should be more careful when they certify their cost and discriminate it between current and noncurrent costs. They should say this is current and these other costs can't be brought up to date and are not as yet.

Mr. HAMMOND. They probably should have a reasonable cutoff in advance of the negotiations or submission of proposal in order to expect that the data would be current.

Chairman PROXMIRE. And you say you plan to discuss this with the Department of Defense, and I hope you will let us know about your discussions as soon as you can.

Mr. HAMMOND. Yes, sir.

Mr. KELLER. Yes, sir, we will.

Chairman PROXMIRE. In your statement you say:

> We found that contracting officers had obtained for each of the 68 contracts a copy of the contractor's catalog or price list. However, for 45 of the 68 contracts, contracting officers had no record of having obtained factual information from contractors on which to make a determination that substantial quantities had been sold to the general public.

Is this required by the regulations?

Mr. KELLER. We are having difficulty with the regulations in this area, Mr. Chairman, and I guess we have been disturbed about this type of procurement for several years, and I know this subcommittee has had trouble with it in the past.

We do not think it is enough just because a contractor makes some commercial sales. We think there should be criteria. We don't see too much wrong with the Renegotiation Act which carves out 55 percent for reporting purposes. We think there should be verifications to make sure these are bona fide sales of the same equipment. We think it is an important area. We think further emphasis should be given to it.

Chairman PROXMIRE. I think it is a rather interesting and serious criticism here. You say "For 23 of the 68 contracts, contractors' sales data had been obtained but had been verified for only nine of the contracts." Why didn't they verify it for all of them. Isn't that required?

Mr. HAMMOND. No, it is not required at the present time.

Chairman PROXMIRE. It is not required. Is nine an adequate sample, in your view?

Mr. HAMMOND. We feel they probably should get certification of the data. They should have the right to verify it and probably verify it on a test basis.

EFFECT OF CATALOG PRICES ON TRUTH IN NEGOTIATIONS ACT

Chairman PROXMIRE. All right.

Now, at the end of the prepared statement you have done an excellent study of catalog or market prices and their effect on the application of the Truth in Negotiations Act. Are you saying the Pentagon has allowed the catalog or market price provision to become a loophole through which contractors can escape without complying with truth in negotiations?

Mr. HAMMOND. We think there should be improvement in connection with catalog priced items, that they more truly be commercial items sold to the public to be used as a basis for determining the reasonableness of price. We believe that Defense should get greater assurance as to the quantity, the size, the numbers sold commercially, and how that compares with the numbers sold to the Government, rather than rely upon it just because they have a catalog.

WAIVER OF TRUTH IN NEGOTIATIONS ACT

Chairman PROXMIRE. What about waivers of the act of determinations by the Pentagon that there is adequate competition and that

Truth in Negotiation does not apply? Have you studied that loophole?

Mr. HAMMOND. We have had some cases where we feel that the departments have depended upon adequate competition when there truly was not competition. We have not found any widespread problems in this area though. We are looking at it.

Chairman PROXMIRE. We have had testimony from Admiral Rickover that in many instances the act is waived when it should not be and determinations are made that there is adequate competition, when there is not adequate competition. Will you comment on that?

Mr. HAMMOND. We have work going on in that area right now and we have from time to time, as I indicated earlier, found cases where the agency depended upon adequate competition and we didn't feel that it was adequate. We have a review going in this area now that should put us in a better position to reach a conclusion on that.

Chairman PROXMIRE. All right. Why don't you pick it up and go ahead.

Mr. KELLER. Do you want me to proceed?

Chairman PROXMIRE. Yes, proceed on contract pricing.

Mr. KELLER. In addition to the foregoing, we currently have underway reviews of contract pricing as well as reviews of Department of Defense procedures and practices that have a general impact on contract pricing. For example, we recently initiated a review of functions relating to the pricing of principal commodities or programs at five major procurement offices. At each office from 50 to 100 procurement actions are being selected to identify the areas most in need of examinations. From these actions we will select individual contracts awarded since January 1, 1969, for pricing reviews at contractors' plants. Similar efforts involving other procurement offices may be undertaken if warranted as a result of the initial work.

Also, we are selecting about 70 contractors for a review of the reasonableness of prices that were negotiated on the basis of cost or pricing data on prime contracts and subcontracts that have been completed in 1969. Contracts on which significant underruns were experienced will be examined in detail to determine the reasons. For this review we plan to select 10 companies that have a high volume of Defense contracts, 20 medium volume companies, and 40 low volume companies.

DEFENSE PROFITS STUDY

Now on our Defense Profits Study, as a result of recommendations originally made by this subcommittee that the General Accounting Office do a study of Defense profits, as you know we felt additional authority was needed for GAO to really do an effective job in this area.

We pointed out what additional authority we should have, and Congress granted some of that authority. We did not get all we asked for at the time the Defense Procurement Authorization bill was enacted. As a result of the law passed by Congress, we have proceeded to develop this study, and we are taking the following approaches:

1. To obtain information on overall profits on negotiated defense contracts, we are developing a questionnaire which we will send to the larger defense contractors and subcontractors and, on a more limited basis, to selected smaller defense contractors and subcontractors. We

will conduct reviews at some of the contractors involved to test the accuracy and completeness of data submitted by them.

2. We have developed an audit program designed to develop cost, profit, and invested capital information for selected contracts. We are testing this program at two contractors and, after making any revision found necessary from our pilot reviews, we plan to develop individual contract profit data on a representative basis.

Chairman PROXMIRE. Let me just interrupt at this point to say that I hope with regard to the subpena power, I tried hard as you know on the floor——

Mr. KELLER. I know you did.

Chairman PROXMIRE (continuing). Just to give you the subpena power to use it on contractors' records and et cetera. I won in the Senate, but the House conferees worked out a compromise with Senator Stennis that either the House or Senate Armed Services Committees could provide you subpena power that you could use. I just want to urge you to use that.

Mr. KELLER We certainly will.

Chairman PROXMIRE. I feel there is some indication of a lack of zeal if you haven't made requests and several requests to the Armed Services Committees for that kind of power because, after all, we know that the studies of profits in the past have not been objective or comprehensive because they have had to be on a voluntary basis and the only contractors responding are those who have—are at the weeping wall.

Mr. KELLER. That is correct, and certainly, Mr. Chairman, the first indication we get or the first refusal we do get we are going to take it up with the committee right away and not let it drag.

Chairman PROXMIRE. All right.

Mr. KELLER. I think there is another important thing I would like to explain: We did feel that to make a good study of defense profits you should have some line on profits made in commercial business. Now that was not granted in the amendment. However, we propose to ask for some of this information in our questionnaire, because I think it is important. As you will recall, in the LMI study, defense profits came out to a certain percentage but the contractors said "We make more on commercial business." We would like to have some means of verifying that type of statement if we run into it again.

Chairman PROXMIRE. Couldn't you get that information from private business and not make it public? Doesn't the amendment say that, my amendment?

Mr. KELLER. Well, we can get it for the purposes of allocating profits to invested capital or sales and so forth. I am not sure we can get it on strictly a commercial product but we are going to try. We are going to ask for it because we think it is to the advantage of both sides to bring this out.

Chairman PROXMIRE. I think it is, too. In fact I am sure there will be some cases where defense profits are too low and I mean that. On the other hand, there will be cases where they are too high. Unless we have it documented and know where it is we are doing a weak job and where maybe too zealous a job we are going to be handicapped in our procurement policy.

Mr. KELLER. We are certainly going to do our best.
Mr. Chairman, that concludes my statement.
(The prepared statement of Mr. Keller and appendixes follow:)

PREPARED STATEMENT OF ROBERT F. KELLER

Mr. Chairman and Members of the Subcommittee. I appreciate the invitation to appear before this Subcommittee today to discuss military procurement. Your letter to us dated November 14, 1969, indicated that you are particularly interested in the status of our work in connection with data relating to major weapons acquisitions and the "should cost" concept of estimating contractor costs. You also expressed an interest in progress in the implementation of the Truth in Negotiations Act, and comments on the latest figures concerning competitive and negotiated contract awards. The information you requested as to the percentage of prime contracts awarded to small business, and improvements, if any, in the gathering of statistical information by the Department of Defense concerning subcontracting in defense procurement is attached to this statement as Appendix V and Appendix VI.

MAJOR SYSTEMS ACQUISITIONS

Because of the increasing significance and magnitude of major systems acquisitions by the Department of Defense and congressional concern, including that of this subcommittee, over contract performance and cost growth, we established a separate group in July 1969, within our Defense Division to place more emphasis on problems associated with the acquisition of major systems.

For our purposes, we have defined major acquisitions as being weapon systems and/or major acquisitions related to weaponry, e.g., aircraft; missiles; boosters; combat, tactical, and support vehicles; ships; submarines; communications systems; space systems; and other acquisitions whose costs are expected to exceed $25 million for RDT&E or $100 million for production.

Our initial efforts have been planned to enable us to furnish the Congress in January 1970, with an overall report dealing with DOD's selected acquisition reporting system as it relates to the cost, schedule and performance experiences of some 50-odd major systems. Reports on the individual systems, practically all of which are classified, are being prepared and will be made available to the Congress.

Work on this assignment commenced in August 1969 and is nearing completion. I should point out that the scope of this initial work was necessarily limited and therefore, our reports will only identify apparent problems with regard to the DOD's Selected Acquisition Reporting (SAR) system and to reported cost, schedule and performance data without attempting to reach definite conclusions as to cause or possible remedies. Additional work will continue to more fully develop the underlying causes of problem areas identified and proposed solutions.

The Department of Defense, at our request, has prepared an inventory of all major systems being acquired by the military services. It is intended that this inventory will be up-dated periodically and will serve as a basis for future selection of systems in our on-going work in reviewing the SAR system. DOD's inventory includes some 130 systems, having an estimated total cost through completion of about $140 billion. Of this amount, about $85 billion has not been funded as yet. This excludes systems for which production is 90 percent or more complete.

It is important to note that, as far as we know, information is not available centrally as to the total number of systems being acquired or their costs. The costs for these systems are essentially system hardware costs including research and development. Other related costs such as special facilities, training, logistics support, etc., associated with major systems are substantial.

The SAR system was introduced in the Department of Defense in early 1968 and has been undergoing refinement since that time. Recently the Deputy Secretary of Defense stated in a directive that it was "* * * the key recurring summary report from project managers and the Military Departments to inform the Secretary of Defense on the progress of their major acquisition programs." The Deputy Secretary has also emphasized to the military services the need for personal involvement in the review and analysis of these reports at the Sec-

retarial level and by all levels of management necessary to ensure that they fairly and accurately reflect the status of the programs being reported.

The SAR reports are prepared quarterly by the responsible military service, usually at the system program or project office. Reports are currently being prepared on 57 designated major systems acquisitions.

We have concluded from our review of the 57 major systems, that the SAR system, in concept, represents a meaningful management tool for measuring and tracking the progress of major acquisitions. However, as with any new reporting system, the SAR system has serious shortcomings and there are several areas where improvements are essential.

We found that the SAR is not sufficiently encompassing and therefore fails to disclose significant matters concerning the progress of Major Acquisitions. For instance:

(1) Although appraisals of certain specified technical features of the systems are required (weight, range, speed, accuracy, etc.) there is no comparison of the technical performance actually demonstrated with that required by the contract.

(2) Major systems delivered without essential subsystems, delays in acquiring Government-furnished equipment, and problems in technical performance of Government-furnished equipment are not required to be reported.

(3) Costs incurred at a particular point in time in relationship to the cost that should have been incurred for the physical progress of the work that has been attained are not reported.

(4) Significant pending decisions that may have a major impact on the program such as changes in quantities or deliveries are not reported.

(5) A comparison of quantities delivered with quantities scheduled to be delivered at that point in time.

We also noted some inconsistencies in the data reported in the SAR's. For example, there was a lack of consistency in (1) the reporting of early developmental costs, (2) treatment of costs attributed to inflationary trends in the economy, (3) treatment of costs involving contract incentive/penalty provisions and claims for equitable adjustments, and (4) the reporting of costs involved in modifying an existing system to accommodate a new subsystem.

I should point out that the Department of Defense is aware of most of these problems and a great deal of attention has been and is continuing to be given to their resolution. A new instruction on the preparation of the SAR's was issued earlier this month by the Secretary of Defense and it is expected that the system will be improved substantially. Specifically, this new instruction does require comparisons of planned and actual technical performance and planned and actual deliveries.

Making a meaningful analysis of the systems costs from the information shown on the SAR's has been a most troublesome task. Our difficulty stems primarily from a lack of consistency by the military services on the type and extent of cost information that is included in the SAR's. We found that approximately 20 percent of the SAR's covering the systems we reviewed did not include certain required program cost data.

We are currently attempting to identify missing data and determine the reasons for differences in the program costs shown in the SARs and DOD cost figures for the same time frame. We expect to be able to reconcile these differences and be in a position to address total cost for the 57 systems covered by our current work in the report we plan to submit to Congress in January 1970.

However, we have been able to make comparisons of cost growth[1] on 38[2] systems using as milestones original planning estimates, contract definition estimates and planned costs at current quantities and we have compared these to the estimates to complete total programs.

As a means of displaying the current status of estimated program costs, SAR instructions require that this data be arrayed in columnar form to show:

1. Original planning estimates
2. Contract definition costs estimates
3. Planned costs at current quantities estimates
4. Current estimate to complete the total program.

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[1] This comprises a dollar growth for many and sundry reasons such as inflation, added capabilities and design changes, technical problems, quantity increases, etc. The figures used are essentially those reported by DOD.

[2] The 38 systems comprise eight Army systems, 22 Navy systems, and eight Air Force systems.

The original planning estimate appearing on the SAR should be the earliest formal estimate prepared by the military department of cost anticipated to be incurred to acquire the quantities needed. It is prepared prior to the initiation of the formal acquisition cycle and usually serves as a basis for initial appropriation requests. Contract definition cost estimates are refinements of the initial planning estimates and are prepared during the course of the project definition phase in which preliminary design and engineering are verified or accomplished, and contract and system management planning are performed. This cycle frequently extends over a period of a year. The planned costs at current quantity estimates are refinements of the earlier estimates adjusted for changes in quantities of the system to be bought. The final estimate is intended to be a current, objective estimate of the costs expected to be incurred to accomplish the entire program and is adjusted for changes in quantity as well as current estimates of cost due to inflation, changes in scope, capabilty increases, program stretch-outs, etc.

In discussing cost growth we believe it is important to recognize that not all cost growth can reasonably be prevented and that some cost growth, even though preventable, may be desirable. Unusual periods of inflation, for instance, result in cost growth. Changes in the state of the art make it possible to incorporate modifications that result in an overall increase in the cost effectiveness of the system. Such cost growth cannot always be anticipated, particularly where a weapons system is in development and production over a long period of time. We believe that the greatest concern should be with cost growth that results from such things as faulty planning, poor management, bad estimating, or deliberate underestimating. Our analysis of the cost growth that has occurred in the weapons systems we reviewed is not as yet complete and we are, therefore, unable to segregate cost growth by its various causes. To be fully meaningful such analysis is essential so that the undesirable and preventable can be identified. The cost growth discussed here today includes all cost growth that has been identified. It is not necessarily all preventable or even undesirable.

Comparing the estimate through program completion (i.e., the current estimate) with earlier estimates prepared on the basis of (1), (2), and (3) above, we found that the 38 systems show a cost growth of $20.919 billion or 49.85 percent from original planning estimates; $13.051 billion or 26.2 percent from contract definition cost estimates; and $13.819 billion or 28.2 percent from planned costs at current quality estimates.

Appendix I to this statement is a summary schedule showing, by service, the estimated cost of the systems at the various SAR milestones, the dollar and percent of growth from each of these stages and the cost estimate through program completion. There is also appended (Appendix II) a schedule showing, by service, similar information on each of the 38 systems.

The explanatory reasons shown on the SARs for cost growth were often voluminous in number and many of the SARs did not relate any monetary value to the reasons given. Where dollars were identified, the reasons most frequently cited were inflation, capability increases, contract cost increases, quantity increases and poor estimating of expected cost and program stretch-outs.

Of particular significance is the effect quantity or capability increases or decreases have on costs over the life of a program. These often times do vary and do significantly impact on total program cost. A determination of cost growth should take into consideration changes in quantities and capability as well as changes in dollars.

Our analysis of the cost data presented in the SARs disclosed numerous instances where costs or potential costs, which will or can impact on program costs, were not shown. Some of the costs which were omitted were not required in accordance with SAR instructions, while others did seem to us to fall within the purview of existing directives governing the preparation of the SAR.

Our analysis of the slippages in the system time schedules as reported on the 57 SARs we reviewed showed that 34 of the systems either had experienced or there were anticipated slippages of from 6 months to more than 3 years from the originally established program schedules, although in many cases the "Initial Operational Capability" date had not changed. Eleven of the systems were in the early phase of the acquisition process and therefore no schedule slippages were reported. For the remaining 12 systems, either no slippage or slippage of less than 6 months was reported.

Over 30 different reasons were cited on the SARs to explain the schedule slippages. Those most frequently cited were: development problems, funding prob-

lems, system design changes, production problems, contract changes, and overly optimistic original schedule estimates. Other reasons cited included delays in associated programs, strikes at contractor plants, problems arising from the Southeast Asia conflict, and late availability of Government or contractor furnished equipment.

Explanations of schedule slippage provided on several SARs were often brief and, in many instances, did not indicate sufficient information to show the basic cause for the slippage.

Concerning system performance, we found that the SARs showed significant variances between the performance expected originaly and that currently estimated for many of the systems we reviewed. In some instances, the variances represented improvements in the system performance while in others a degradation in performance of the system had occurred or was expected. Still in others. tradeoffs in technical characteristics had occurred which resulted in improved performance in some aspects of the system and degraded performance in others.

Reasons cited for the differences were many and varied. Some were common among several systems, while others were unique to a particular system. Some of the principal reasons cited included (1) inability to meet technical design specifications, (2) technical objectives beyond the state-of-the-art, (3) inaccurate or overly optimistic estimates of expected performance, (4) improved design to increase capability, and (5) desire to upgrade performance and reliability.

"Should Cost" Concept

In the May 23, 1969 report of your Subcommittee, it was recommended that GAO study the feasibility of incorporating into its audit and review of Government contracting the "should cost" method of estimating contractor cost. Appendix III summarizes the results of our work to date on this project. Briefly, we find that the use of the "should cost" concept is not unusual in the industrial world and we believe there is room for considerably greater application in Government procurement. Our tentative conclusions to date are summarized below:

DOD's role in "should cost" surveillance

It seems clear that the Government negotiator needs good data to effectively balance the many advantages the contractor usually has during negotiations. We believe that a "should cost" review can be very effective in assisting the Government negotiator in achieving a fair and reasonable contract price, if it is performed prior to contract award.

We believe that the Department of Defense and civil agencies of the Government can be more effective in their preparation for negotiations with a contractor. Such preparation should include (1) a realistic estimate of what the desired item should cost and (2) a concerted team effort, using "should cost" concepts, to evaluate the contractor's proposal. The Department of Defense should also consider the use of postaward "should cost" reviews. Such reviews of major procurements on a postaward basis could provide management with valuable data on (a) the contractor's performance and cost consciousness and (b) the adequacy of the Government's prenegotiation reviews. This would appear to be a logical extension of present Air Force and Navy practices.

Feasibility of GAO's use of "should cost" principles

The May 1969 Committee Report specifically asked that we evaluate the feasibility of incorporating "should cost" concepts into our regular contract reviews. We believe that the use of these concepts during our postaward reviews is feasible. Our tentative conclusions in this regard are as follows:

(1) GAO reviews in the past have to some extent used post-award "should cost" techniques; however, these individual reviews generally did not cover all aspects of a company's operation, instead these covered problems in given functional areas.

(2) GAO will monitor the extent to which DOD will perform "should cost" reviews in the preaward and postaward contract phases in the future.

(3) GAO plans to make selected "should cost" reviews on a broader basis than we have in the past to provide us with further information on the practicability and value of such efforts. In this connection some added skills will be required and the practicability of performing these reviews will be dependent upon the availability of these added skills.

(4) GAO will, upon completion of these selected reviews, decide whether a continuing "should cost" capability is warranted.

Trends in Military Procurement

During fiscal year 1969, total military procurement, excluding intra-governmental orders, amounted to $40.7 billion. This represents a decrease of about $2 billion below the level of the previous year.

Department of Defense statistics for the 8-year period ended June 30, 1969, show that of the procurement dollar, formally advertised procurement averaged about 13 percent; price competitive negotiation about 31 percent; and single-source procurement, including noncompetitive follow-on after price competition and design, technical or other competition, about 56 percent. The statistics reflect a trend toward increased use of competitive procurement under both advertised and negotiated procedures from 1963 to 1966. However, since 1966 there has been a progressive decline in the use of these two methods of procurement. For instance, formally advertised procurement during fiscal year 1969 was 11 percent, down from 17.6 percent in 1965 and from 11.5 percent in 1968. DOD believes that much of this is due to the conflict in Southeast Asia. A summary of the changes by year in all three areas for fiscal year 1962 through 1969 is shown in Appendix IV as well as additional details with respect to each of these areas.

Contract Pricing

Subsequent to the issuance of Defense Procurement Circular No. 57, the General Accounting Office conducted contract pricing reviews at 156 contractor locations involving contracts amounting to about $2.6 billion. The contract pricing reviews we made fall generally into three categories:

Reviews of negotiated prices of contracts whose proposals were solicited prior to the publication in November 1967 of Defense Procurement Circular No. 57.

Similar reviews where proposals were solicited after publication of the Circular, and

Reviews of Department of Defense procedures and practices having a general impact on contract pricing.

Proposals predating issuance of Defense Procurement Circular No. 57

We examined into the prices negotiated for 34 procurements awarded during calendar years 1965, 1966 and 1967 by the Department of the Navy to six different contractors for the production of 250-pound and 500-pound general purpose bomb bodies under firm fixed-price contracts having a value of about $343 million. Award of these contracts predated the issuance of Defense Procurement Circular No. 57 in November 1967, which as you know, provided for improvement in contracting procedures.

We found that (1) the prices for 33 procurements totaling about $309 million were higher by about $13.9 million than indicated by cost or pricing data available to the contractors prior to each of the negotiations, (2) prices negotiated for 12 procurements amounting to about $172 million included cost estimates of about $46 million for which sound and realistic cost or pricing data were not available, and (3) Navy contracting officials either had not requested preaward audits for eight of the 34 procurements or, where requested, the Navy imposed time restrictions which limited the scope of the audits.

In our opinion the prices for the bomb bodies could have been significantly reduced if the Navy had required the contractors to submit or identify in writing accurate, complete and current cost or pricing data in support of cost estimates in price proposals, and had made adequate reviews and evaluations of the factual data available to the contractors in support of these estimates. Furthermore for certain of these procurements time limitations and the absence of realistic cost data precluded adequate documentation of the contrctors' proposals and agency audits, and we believe that the Navy should not have used firm fixed-price type contracts.

We proposed that the Department of Defense consider our findings, as well as any additional information available to determine the extent of the Government's legal entitlement to price adjustments with respect to these procurements. The Navy concurred with our proposal and initiated actions necessary to effect price adjustments under the contracts. In regard to the use of firm fixed-price contracts, the Navy advised that at the time of the awards there was an emphasis by Department of Defense officials on the use of firm fixed-price contracts to the maximum extent possible and an over-zealous application by contracting officials of this policy. The Department of Defense has recognized this over-re-

action and has issued instructions concerning the misuse of firm fixed-price contracts.

The Department's procurement management review group has reviewed the practices of offices responsible for ammunition procurement and has noted practices that need improvement similar to those we had noted. Also, the Defense Contract Audit Agency has performed post-award audits of 20 ammunition contracts and has reported defective pricing in some instances.

REVIEWS MADE SUBSEQUENT TO THE ISSUANCE OF DEFENSE PROCUREMENT CIRCULAR NO. 57

In the fall of 1968 we initiated a review to evaluate the effectiveness of revised Defense regulations in achieving fair and reasonable negotiated prices.

We selected 35 negotiated contracts amounting to about $136 million that were awarded to 21 contractors. The bulk of the contracts we examined were selected on a random basis from Department of Defense contract award announcements and from a computer tape of contract awards during the first quarter of fiscal year 1969. An attempt was made to include contracts awarded by all three services, as well as some representation of the various dollar strata and major commodity groups. All contracts selected were required to meet the following criteria:

Negotiated firm fixed-price or fixed-price incentive contracts.

Price negotiated was based on certified cost or pricing data submitted by the contractor.

Request for proposal or unsolicited proposal was subsequent to January 1, 1968.

Dollar value is excess of $100,000.

We reviewed about $84 million or about 62 percent of the significant cost elements included in the negotiated contract prices. Overpricing of about $1.6 million, or about 2.0 percent of the cost elements reviewed, has been tentatively identified. For the most part, the cases identified were similar in that they involved negotiations on the basis of data that was not the best data available at the time the negotiation occurred. We plan to summarize our findings in a report to be issued to the Congress.

We also initiated a review of the problems experienced by contractors and agency procurement officials in implementing the cost or pricing data submission provisions of Public Law 87-653. Forty-five contractors and 23 procurement and contract administration activities were involved in our review, the objective of which was to determine the magnitude and frequency of problems encountered by agency officials and contractors in their attempt to abide by the requirements of law. Our report is presently in process and we have not yet presented our findings to the Department of Defense for comment. Three problem areas seemed to occur with enough frequency to warrant a detailed review. These were:

The apparent lack of agreement or understanding on the part of some contractors and some agency personnel with respect to what cost or pricing data is required to be submitted and/or identified to adequately comply with the law.

Whether separate cut-off or closing dates for different types of cost data, as permitted by the Armed Services Procurement Regulation, are being established and used, and whether the general requirement for updating all cost data to the date of agreement on price is feasible and/or unduly burdensome to contractors.

How to deal with the problem of subcontractors' refusals to submit cost or pricing data they consider confidential to prime contractors whom they regard as competitors that they are willing to submit to the Government.

We found instances where agency officials did not consider that the data, initially submitted by contractors in support of price proposals, conformed to the requirements of the procurement regulations. The procurement officials and auditors subsequently requested and were able to obtain data needed to make an evaluation as to the reasonableness of the price. However, those instances indicated a lack of agreement or understanding between contractors and agency officials as to the cost or pricing data required. We believe that the detailed guidelines for the submission of cost or pricing data, published in February 1969 in the ASPR Manual for Contract Pricing, will help to clarify areas of misunderstanding of data submission requirements. In part, the detailed guidelines reflect experience gained since the issuance of Defense Procurement Circular No. 57.

The regulations now call for a certificate that all data submitted are accurate, complete, and current as of the date of agreement on price. However, in recognition of the fact that certain types of data, such as overhead, are ordinarily not reflected in accounting records on as current a basis as other data such as, for example, material costs, the regulation permits the establishment of closing or "currency" dates for such less current data which precede the date of agreement on price. We found that contractors and agency procurement officials are not establishing such earlier closing or cut-off dates for data which are not reasonably available as currently as the date of price agreement. Contractors are presently, for the most part, certifying that all types of cost data submitted by them are current right up to the date of agreement on price. We think this is unrealistic in view of the difference in reasonable availability of differing types of cost data, and in view of the possibility that contractors may legally be held only to a standard of reasonable availability. It would be preferable, it seems to us, that agreement be reached during contract negotiations as to the "currency" of different types of cost data which the contractor is willing to certify and be held accountable for. We plan to discuss this with the Department of Defense.

Regarding subcontractors' refusals to submit cost or pricing data to prime contractors that they are willing to submit to the Government, there is a serious question as to whether the rights of the Government may have been abridged in a subsequent defective pricing action if the Government had previously reviewed the subcontractor's data and advised the prime on its acceptability. While attorneys for various Government procurement agencies queried on this point generally agree that the rights of the Government might be jeopardized, it is not clear what action, if any, could be taken to avoid the Government's compromising its position.

CATALOG OR MARKET PRICES

We also examined 68 negotiated Department of Defense contracts for over $100,000 each to ascertain whether acceptance by agency officials of contractors' catalog prices adequately carried out the objectives of Public Law 87–653. This law provides that procurement officials may accept catalog prices of commercial items sold in substantial quantities to the general public without requiring submission of cost or pricing data. All contracts included in our review were negotiated on a sole-source basis. Our report on the review was issued to the Congress on December 3, 1969.

We found that contracting officers had obtained for each of the 68 contracts a copy of the contractor's catalog or price list. However, for 45 of the 68 contracts, contracting officers had no record of having obtained factual information from contractors on which to make a determination that substantial quantities had been sold to the general public. For 23 of the 68 contracts, contractors' sales data had been obtained but had been verified for only 9 of the contracts.

Department of Defense policies and criteria do not provide specific guidance with respect to the amount of commercial sales that should be considered substantial. This has led to the acceptance of diverse and/or seemingly minor amounts of commercial sales as "substantial." In this connection the Renegotiation Act establishes for standard commercial items a specific percentage of commercial to total sales for determining whether the items are subject to the profit limitations of the Act.

We also found instances where the largest individual commercial sale of an item was for substantially smaller quantities than those being purchased under individual Department of Defense contracts. Under these circumstances, there was no assurance that the price paid by the Government for the quantities it was purchasing would have been paid by commercial buyers for quantities comparable to the Department of Defense purchases.

The Department of Defense has improved its guidance with respect to type of data to be obtained from contractors prior to the award of catalog or market priced contracts. However, it has not provided any new guidance as to how this data is to be used.

We suggested that the Department of Defense:

(1) provide more definite criteria for determining substantial sales to the public. Consideration should be given to establishing criteria similar to that for standard commercial items in the Renegotiation Act.

(2) revise the Armed Services Procurement Regulation to require appropriate consideration of the relative quantities involved in individual com-

mercial sales and sales to the Government, in determing whether the catalog price exemption should apply.

(3) consider requiring contracting officers to (a) obtain a certification from the contractor that the sales data being submitted are complete and accurate, (b) include a provision in each proposal and any resulting contract which would permit Government representatives to examine the contractor's pertinent books and records in order to verify the information submitted in support of the proposal, and (c) verify sales data obtained from contractors.

The Department of Defense has proposed a revision to the Armed Services Procurement Regulation that implements, for the most part, only our third suggestion.

CONTRACT PRICING WORK CURRENTLY UNDERWAY

In addition to the foregoing, we currently have underway reviews of contract pricing as well as reviews of Department of Defense procedures and practices that have a general impact on contract pricing. For example, we recently initiated a review of functions relating to the pricing of principal commodities or programs at five major procurement offices. At each office from 50 to 100 procurement actions are being selected to identify the areas most in need of examinations. From these actions we will select individual contracts awarded since January 1, 1969, for pricing reviews at contractors' plants. Similar effort involving other procurement offices may be undertaken if warranted as a result of the initial work.

Also, we are selecting about 70 contractors for a review of the reasonableness of prices that were negotiated on the basis of cost or pricing data on prime contracts and subcontracts that have been completed in 1969. Contracts on which significant underruns were experienced will be examined in detail to determine the reasons. For this review we plan to select 10 companies that have a high volume of Defense contracts, 20 medium volume companies, and 40 low volume companies.

DEFENSE PROFITS STUDY

We have commenced work on the study and are taking the following approaches:

1. To obtain information on overall profits on negotiated defense contracts, we are developing a questionnaire which we will send to the larger defense contractors and subcontractors and, on a more limited basis, to selected smaller defense contractors and subcontractors. We will conduct reviews of some of the contractors involved to test the accuracy and completeness of data submitted.

2. We have developed an audit program designed to develop cost, profit, and invested capital information for selected contracts. We are testing this program of two contractors and, after making any revision found necessary from our pilot reviews, we plan to develop individual contract profit data on a representative basis.

This concludes my prepared testimony, Mr. Chairman. We will be glad to respond to any questions you or the other members of the Subcommittee may have.

APPENDIX I

COST ESTIMATES FOR SELECTED SYSTEMS

[In millions]

Service and number of systems	Planning estimate	Contract definition	Initial planning cost or contract definition adjusted for change in quantities [1]	Current estimate total program
	(1)	(2)	(3)	(4)
Army (8)	$5,429.1	$5,598.4	$7,271.6	$8,027.7
Navy (22)	18,042.4	21,437.4	23,220.3	28,758.8
Air Force (7)	18,589.3	22,309.6	18,708.9	26,371.6
Total (37)	42,060.8	49,345.4	49,200.8	63,158.1

[1] The SAR refers to this as "planned costs at current quantities."

COST GROWTH (RECAP OF ABOVE SCHEDULE)

	Cols. 1–4	Cols. 2–4	Cols. 3–4
Army:			
Dollars	2,598.6	2,429.3	756.1
Percentage	47.86	43.39	10.40
Navy:			
Dollars	10,716.4	7,321.4	5,538.5
Percentage	59.40	34.15	23.85
Air Force:			
Dollars	7,782.3	4,062.0	7,662.7
Percentage	41.86	18.2	41.49
Total:			
Dollars	21,097.3	13,812.7	13,957.3
Percentage	50.16	27.99	28.37

APPENDIX II

SCHEDULE OF PROGRAM COST DATA APPEARING ON JUNE 30, 1969 SARs[1] AND ARRANGED BY ACQUISITION PHASE AND MILITARY SERVICE

[In millions]

	Planning estimate	Contract definition	Initial planning cost or contract definition adjusted for change in quantities	Current estimate, total program
Concept formulation ( ):				
None of the 57 systems are in this phase as of December 23, 1969.				
Contract definition (7):				
Army				
Navy:				
DD–963	$1,396.55	(3)	$1,737.55	$3,350.3
CVA–69	519.0	(3)	519.0	
DXGN	726.6	(3)		4,750.09
Air Force:				
B–1	8,800.0	(3)	8,800.0	8,800.0
F–15	6,039.0	(3)	6,039.0	7,700.0
AWACS	2,652.7	(3)	2,652.7	2,652.7
RF–111D	579.4		542.1	895.7
Engineering and/or operational systems development (50):				
Army:				
Dragon	381.3	$425.5	464.4	832.9
Shillelagh	373.1	373.1	380.3	573.2
AH–1G	49.8	70.7	466.2	561.0
Safeguard	4,185.0	4,185.0	4,185.0	4,185.0
Gama Goat	69.1	168.1	369.2	373.6
Sheridan tank	388.7	398.1	548.0	689.6
Cheyenne	125.9	125.9	125.9	[2]203.9
UH–1H	341.3	341.3	1,140.9	1,235.4
TOW[4]	410.4		366.8	944.7
Sheridan ammo [5 6 8]	370.1			489.0
CH–47 helicopter				1,323.7
Lance	543.8		421.9	472.3
SAM–D	4,816.5	3,910.0		3,372.1
Navy:				
P–C3	1,294.2	1,294.2	2,265.3	2,261.7
AN/BBQ–2	126.9	179.0	178.5	269.9
Sparrow E	687.2	740.7	265.6	258.1
Sparrow F	139.8	387.1	246.3	425.9
Phoenix	370.8	469.0	529.6	1,022.3
Mark 46-Mod 1	347.0	1,033.6	1,021.6	1,039.9
Mark 48-Mod 0	682.4	700.3	715.3	3,890.7
EA 6–B	689.7	817.7	793.7	1,034.9
Walleye II	345.3	345.0	123.9	134.6
F–14	6,166.0	6,166.0	6,166.0	6,373.0
Standard arm	180.3	241.6	220.0	250.7
S–3A	1,763.8	2,891.1	2,891.1	2,891.1
AN/SQS–23	160.2	175.6	116.6	321.7
A–7E	1,465.6	1,465.6	1,421.5	1,919.1
Mark 48-Mod 1	70.7	71.6	71.6	111.1
Condor	117.2	126.0	126.0	167.0

See footnotes at end of table.

APPENDIX II—Continued

SCHEDULE OF PROGRAM COST DATA APPEARING ON JUNE 30, 1969 SARs[1] AND ARRANGED BY ACQUISITION PHASE AND MILITARY SERVICE—Continued

[In millions]

	Planning estimate	Contract definition	Initial planning cost or contract definition adjusted for change in quantities	Current estimate, total program
Engineering and/or operational systems development (50):—Continued				
Navy—Continued				
F-4J	770.0	770.0	2,509.6	2,743.7
AN/SQS-26CX	95.7	88.8	95.6	119.6
CH46 E/F helicopter	323.6	589.0	577.1	550.6
LHA	651.0	1,346.5	1,346.5	1,379.4
DE-1052	1,285.0	1,259.0	1,259.0	1,286.0
CVA-67	310.0	280.0	280.0	307.8
CVAN 68[3]	427.5	427.5	427.5	
Poseidon[3]		4,384.0		5,602.0
Subroc[3]		438.8	462.3	591.4
SSN 637[3]			2,515.8	2,838.9
Air Force:				
Minuteman II	2,872.5	4,164.2	4,168.2	4,280.7
Minuteman III	2,678.1	4,339.0	4,060.3	4,226.0
C-5A	3,423.0	3,370.0	3,370.0	4,832.0
Maverick	257.9	391.8	213.1	374.7
A-7D	1,378.1	2,012.1	2,012.1	2,012.2
Titan III	932.2	745.5	745.5	1,130.5
F-111 A/C/D/E	4,686.6	5,505.5	2,941.9	7,401.3
F-B111A	1,781.5	1,781.5	655.7	1,218.5
SRAM[4]		261.1		1,470.1
F-4E[4]				2,630.8
RF-40[4]				1,571.0

[1] The system acquisition stage and the cost data presented in this schedule includes DOD and services' adjustments through Dec. 23, 1969.
[2] Not available.
[3] While this is the estimate appearing on the SAR at Mar. 31, 1969, it should be noted that due to litigation the Army currently estimates their liability as unknown.
[4] Systems in engineering and/or operational systems development and 1 or more of the program cost elements was omitted on the June 30, 1969, SAR.
[5] The DOD considers this as an annex to the Sheridan vehicle and not a weapon system itself.

APPENDIX III

Feasibility of GAO Using "Should Cost" Concepts

In your May 23, 1969, report it was recommended that GAO study the feasibility of incorporating into its audit and review of contractor performance the "should cost" method of estimating contractor costs. I would like to explain the scope and methodology of our study and then present some of our findings and tentative conclusions.

SCOPE AND METHODOLOGY OF STUDY

Our evaluation of the proposed incorporation of "should cost" concepts into GAO reviews of contractor operations included research into the contracting practices employed by the Government and industry, and covered (1) procedures employed in arriving at the Government's independent estimates of the reasonableness of prices for the desired items; (2) adequacy of proposal review; (3) differences existing between Government and industry practices in arriving at a prenegotiation position; (4) differences between Government and industry in providing postaward surveillance; and (5) Governmental agencies' positions with respect to providing "should cost" evaluations.

In arriving at our tentative conclusions for this study we discussed these matters with officials of two consulting firms; the Department of Defense and the individual military services; the Defense Contract Audit Agency; the Defense Contract Administration Services, Defense Supply Agency; the Atomic Energy Commission; the National Aeronautics and Space Administration; the General Services Administration; and the Corps of Engineers. We also discussed the subject with various representatives from industry, including companies that were engaged in Government and commercial work as well as those that operate exclusively in a commercial atmosphere. In addition, we have dis-

cussed this subject on an informal basis with the Council of Defense and Space Industry Association.

The major observations to date are discussed in the sections which follow:

(*a*) Definition of "should cost" concepts,
(*b*) Government versus commercial procurement objectives,
(*c*) Industry procurement practices,
(*d*) Need to improve Government procurement practices,
(*e*) Applicability of "should cost" concepts, and
(*f*) Tentative conclusions.

DEFINITION OF "SHOULD COST" CONCEPTS

The "should cost" approach attempts to determine the amount that a product ought to cost, given attainable efficiency and economy of operation. This approach utilizes all the current techniques that are employed in proposal evaluation by the Government; in addition, it tries to evaluate whether the contractor's operations are being performed in an efficient manner. To this extent the approach differs from the traditional one in which costs are estimated on the basis of historic or past experience. The emphasis in the "should cost" approach is on the contractor system of managing and controlling activities and costs, and on procedures employed in achieving economy and efficiency.

We believe there are two distinct areas in the procurement process in which the "should cost" concepts could apply. These are the prenegotiation process and postnegotiation review or surveillance. The prenegotiation phase should include a good Government-prepared estimate showing the reasonableness of the price for the item desired, and it also should include a thorough review of the contractor's proposal. Such a review should be conducted by competent personnel, should cover all major areas of the contractor's operation, and, to the extent possible, should (a) identify any areas in need of improvement and (b) provide the contracting officer with alternatives available to him in negotiating the particular procurement involved. The post-negotiation phase, on the other hand, includes the reporting requirements imposed under the contract, and any postaward review functions whether these be performed by regular Department of Defense activities, by specially selected teams, or by the General Accounting Office.

GOVERNMENT VERSUS COMMERCIAL PROCUREMENT OBJECTIVES

Over the years the Government has found it necessary to request new legislative action, change the regulations, and implement new procedures to cover the procurement of complex systems, hardware, and services. To the extent deemed practicable, it has tried to pattern these procurement procedures to the practices followed by industry in the commercial marketplace. In order to pattern the Government's system after that used by industry, one must assume that (a) the basic ground rules and objects in commercial prime/subcontractor relationships are the same, (b) the factors which motivate these parties are similar, and (c) the relationship and cooperation between the parties are identical. Discussed below are some key differences that were pointed out during our study.

Commercial prime/subcontractor objectives

In the commercial atmosphere, both parties to a contract generally work toward a common objective of marketing the product at a reasonable price, to produce a consumer demand that will yield a good return on the investment. In the commercial market, the buyer or retailer will generally survey the market and conduct a market analysis as to the consumer demand that can be generated for a new item at given prices. Once a decision is reached that a project is feasible, the prime contractor works with the subcontractor to reduce production costs to the extent possible. This is especially true of those items that have a rather elastic demand curve.

To the extent that costs can be reduced, the market price may be dropped, thus generating an even greater consumer demand. This increased demand will directly benefit the subcontractor, since he can expect more work. Thus, from a long-range objective, it behooves both parties to try to cooperatively work toward this common objective.

This same motivating factor, which forces a close cooperative bond in many commercial procurement actions, may not be present in Government procurements. Essentially, the Government (*a*) predetermines the quantities needed and

(*b*) decides how much money can be budgeted for a particular end item. Therefore, if funds can be saved through cost reduction programs, it is very likely that the funds saved will be reprogrammed to buy other needed materials or services. If, on the other hand, the price is higher than originally anticipated, the Government has to (*a*) either budget additional funds, or (*b*) try to stay within the budgeted limitation and get by with a smaller quantity. Therefore, the Government contractor, through a cost reduction, does not stand to benefit in added sales volume as might be the case for his commercial counterpart.

Cooperation between contracting parties

In recent years there has been considerable concern evidenced by the Department of Defense over the Government's involvement in contractors' activities, generally referred to as engagement and disengagement. In our discussions with several companies' representatives, we learned that a true cooperative atmosphere existed in their prime/subcontractor relationship on their commercial products. This relationship was viewed as a long-term partnership arrangement in which both parties were genuinely interested in promoting a good healthy atmosphere. In these conditions the subcontractors recognized that the primes did have certain talents available, and they had no qualms about asking for special assistance in rather technical areas to try to improve the manufacturing operations. There appeared to be a frequent exchange of available talent and complete interechange of cost and production data.

One company representative stated that it was his view that his company had every right to be at the subcontractor's plant. This individual mentioned that his company had an incentive sharing clause in its subcontract; to the extent that their representatives could effect savings in the manufacturing process, this effort would return roughly seventy cents on each dollar saved. He felt it was his company's money that was paying for the effort at the subcontractor's plant, and for that reason his company had every right to insist on improvements in the production of the end item.

It would appear that the Government should be essentially in the same position on any of its negotiated contracts. In essence it is the taxpayer who is paying for the contracted effort, and if there are procedures that can be improved at a given plant, it would be reasonable to expect that the Government would take every possible course of action to effect such reductions. However, it is precisely in this particular area where contractors claim that the Government is meddling in the operations of a private concern. Both the Government and the contractor should realize that this effort on the part of the Government is really no different from what is an accepted practice in the commercial atmosphere and, therefore, there should be less concern about the Government's possible "engagement" in contractor activities.

INDUSTRY PROCUREMENT PRACTICES

Our discussions with various industries' representatives have shown that "should cost" concepts are employed in varying degrees by the companies that we contacted. The individuals we interviewed stressed that in order to have an effective negotiation process both parties need to make a thorough review prior to negotiations. Some of the techniques that were specifically mentioned as being essential to industry during their negotiation process are (1) clearly defined scope of work—including good specifications and drawings, and (2) an estimate of what the required item should cost, made independently of the manufacturer's proposed price.

These representatives characterized their relationship with their subcontractors as one of complete cooperation. As a result of this mutual cooperation and understanding, we were told that post-award surveillance and periodic reporting becomes commonplace.

We found that postaward surveillance included complete involvement in the operations of the subcontractor. This would include the sending of industrial engineers and other technical personnel into the subcontractor's plant to assist in solving problem areas. Also, we found that it was common practice for industry to require their suppliers to report technical and financial information on a monthly or quarterly basis. This information not only includes past performance data but also budgetary type data. In some instances the subcontractor will furnish the same information to the prime that he provided his own management. Other tools that are used by industry include periodic meetings with the subcontractor's management. These meetings include discussions of the technical performance as well as his financial operations.

NEED TO IMPROVE GOVERNMENT PROCUREMENT PRACTICES

During our study it became apparent that a "should cost" review is not a cure-all and is not a substitute for following, on a day-to-day basis, sound procurement practices in negotiating, administering, and reviewing Government contracts. We believe that the Government can do considerably more in its preparations for negotiations with a contractor and that many of the "should cost" concepts can actually be used by the Government during this prenegotiation phase.

Cost analysis of a contractor's proposal is a technique used, in the absence of price competition, to achieve that which competition is presumed to supply; namely, a fair and reasonable price. A well-designed cost analysis will uncover all those underlying facts which will make it more likely to reach a fair and reasonable price. This price is strongly influenced by the prospect of what it should cost to perform if the contractor operates with reasonable efficiency, effectiveness, and economy. After completing the cost analysis, the conclusions reached as to what contract performance should cost will form the basis for developing a price objective to be used during negotiations.

After reviewing the background on the "should cost" study made at Pratt and Whitney Aircraft, Division of United Aircraft Corporation, as well as the series of reports that resulted from the study, it became apparent that in addition to the "should cost" review other factors contributed to Mr. Gordon Rule's (Department of the Navy) success. These factors are listed below:

1. Having sufficient time to make thorough preparation for negotiations.
2. Including the contractor's total operation on the scope of the study.
3. Being present during the study and having the direct responsibility for directing or re-directing the review effort.
4. Being able to select competent review team members from throughout the DOD establishment.
5. Having extremely competent team members, both technical and financial, work side by side and actually participate in the negotiations.

There appears to be no question that Mr. Rule's review at Pratt & Whitney Aircraft was markedly superior to normal pricing reviews, where independent inputs are received by the contracting officer from various participants. The Government negotiator generally is at a disadvantage in trying to negotiate, since the contractor knows not only all the facts and assumptions underlying his estimates, the alternatives available to him, and the contingent areas, but he also knows the price at which he will be willing to accept the contract.

Mr. Rule, as a result of his "should cost" review at Pratt and Whitney Aircraft, was aware of many of the facts and assumptions underlying the contractor's proposal. He was also aware of many contingent areas in the proposal and the alternatives that were available to the contractor. Most important, Mr. Rule had developed an independent estimate of what the engine should cost.

While it is DOD policy to utilize an integrated team approach for pricing purposes, we have found that this approach—although it may be conceptually sound—has not always been fully effective. We believe that the following factors have had, and are continuing to have, a direct and adverse impact on the Government's current pricing efforts:

a. Time allowed for the pricing review is often insufficient.

b. The caliber of work performed and the scope of the review in many cases are not satisfactory.

c. Coordination among the procuring contracting officer, administrative contracting officer and his staff, and the Defense Contract Audit Agency is not always effective.

d. Contracting officers do not always have sufficient autonomy and authority.

APPLICABILITY OF "SHOULD COST" CONCEPTS

Our discussions with various officials in the Department of Defense and in each of the military services, as well as in selected civilian agencies, showed that they they do not have an established capability for performing this type of review on a continuing basis. Furthermore, these officials currently do not plan to provide such a continuing capability, nor do they plan to perform extensive reviews of the type performed by Mr. Rule. One exception to this position was noted in

the Department of the Army, which is currently studying the possibility of setting up a capability to perform these types of reviews.

The officials contacted believed that many of the "should cost" principles are used in their day-to-day transactions. However, they readily admitted that these applications are limited in scope and cannot compare with the comprehensive type review performed at Pratt and Whitney Aircraft. Generally, in any of the work performed in getting ready for negotiations of a major contract, the Government, in a good review effort, would have asked itself what a reasonable price might be for the effort contemplated. Furthermore, in a good review of a contractor's proposal, questions would and should be asked as to the need for some of the cost elements quoted, and alternative courses of action should be presented to the contracting officer to assist him during the negotiation process.

We were told that the Air Force Industrial Management Assistance Surveys and the Navy Industrial Management Reviews, which have been conducted on a regular basis at selected contractor plants, do represent a type of "should cost" review. These efforts are similar to Inspector General reviews; therefore, we have been furnished only limited data. Based on this limited data, it appears that many of the functional areas under review are similar, but the coverage is limited.

TENTATIVE CONCLUSIONS

DOD's role in "should cost" surveillance

As discussed above, the Government negotiator needs good data to effectively balance the many advantages the contractor usually has during negotiations. We believe that a "should cost" review can be very effective in assisting the Government negotiator in achieving a fair and reasonable contract price, if it is performed prior to contract award.

We believe that the Department of Defense and civil agencies of the Government can be more effective in their preparation for negotiations with a contractor. Such preparation should include (1) a realistic estimate of what the desired item should cost and (2) a concerted team effort, using "should cost" concepts, to evaluate the contractor's proposal. The Department of Defense should also consider the use of postaward "should cost" reviews. Such reviews performed on major procurements on a postaward basis could provide management with valuable data on (a) the contractor's performance and cost consciousness and (b) the adequacy of the Government's prenegotiation reviews. This would appear to be a logical extension of present Air Force and Navy practices.

Feasibility of GAO's use of "should cost" principles

The May 1969 Committee Report specifically asked that we evaluate the feasibility of incorporating "should cost" concepts into our regular contract reviews. We believe that the use of these concepts during our postaward review is feasible. Our conclusions in this regard are as follows:

(1) GAO reviews in the past have on many occasions used postaward "should cost" techniques; however, these individual reviews generally did not cover all aspects of a company's operation, instead these covered problems in given functional areas.

(2) GAO will monitor the extent to which DOD will perform "should cost" reviews in the preaward and postaward contract phases in the future.

(3) GAO plans to make selected "should cost" reviews on a broader basis than we have in the past to provide us with further information on the practicality and value of such efforts. In this connection some added skills will be required, and the practicality of performing these reviews will be dependent upon the availability of these added skills.

(4) GAO will, upon completion of these selected reviews, decide whether a continuing "should cost" capability is warranted.

APPENDIX IV

Trends in Military Procurement

The formally advertised method of procurement is generally used by the Department of Defense in the procurement of commercial-type items—such as clothes, petroleum products, lumber, and paint—as well as items of conventional military equipment which can be supplied by many concerns. These items are normally purchased by formal advertising except where the time and expense of

preparation for formal advertising cannot be justified as in small purchases and emergency procurement. According to Department of Defense statistics, formally advertised procurements last year amounted to $4.5 billion, or 11 percent of its total procurement expenditure. In the fiscal year 1965, a high of 17.6 percent was reached. Since then the percentage of formally advertised procurement progressively declined to 14.2 percent in fiscal year 1966; 13.4 percent in fiscal year 1967; 11.5 percent in fiscal year 1968; and finally to a new low of 11 percent in fiscal year 1969.

The Department of Defense has, except for the last three years, made increasing use of a second method of procurement which is referred to as competitive negotiation. This method is often used in the development and production of complex military weapons and equipment. These include aircraft, missiles, ships, tanks, radar and other complicated items which generally have no counterparts in the commercial market and other items procured under urgent conditions.

In competitive negotiation, factors other than price tend to have a much greater influence on the award. These factors are technical design management capability, speed of delivery, and size and nature of a contractor's organization, personnel and facilities.

Under this procedure proposals are requested from potential suppliers and responses are evaluated on the basis of design, speed of delivery, contractor capability and price. Based on this evaluation, negotiations are conducted with offerors to resolve differences and to arrive at a firm contract with the successful offeror.

The value of items negotiated last year under this kind of competitive procedure through price or technical competition amounted to about $11.7 billion, or about 28.7 percent of total procurement expenditures. In the fiscal year 1966, a high of 35.8 percent was reached. Since then the percentage has progressively declined to 34.1 percent in fiscal year 1967; 30.6 percent in fiscal year 1968; and, as previously indicated, to 28.7 percent in fiscal year 1969.

The third method of procurement, referred to as single-source or sole-source procurement, is where competition does not exist. Under certain conditions its use may, in fact, be the only practicable method available. At the same time, this method of procurement obviously requires more safeguards in the procurement procedures followed and its use should be avoided when competitive forces can be effectively utilized in the Government's interest. This method is used in more than one-half of total Department of Defense procurement—about $24.5 billion last year or 60.3 percent. In prior years this percentage ranged from a low of 50 percent to a high of 60.5 percent.

MILITARY PRIME CONTRACT AWARDS, BY METHOD OF PROCUREMENT

Fiscal year	Total procurement (billions)	Formally advertised (percent)	Negotiated (percent)		
			Multiple sources solicited (competitive procedure)	Single source solicited (noncompetitive procedure)	Total
1962	$28.1	12.4	27.1	60.5	87.6
1963	29.0	12.7	28.1	59.2	87.3
1964	28.2	14.4	30.7	54.9	85.6
1965	27.4	17.6	31.1	51.3	82.4
1966	37.2	14.2	35.8	50.0	85.8
1967	43.4	13.4	34.1	52.5	86.6
1968	42.7	11.5	30.6	57.9	88.5
1969	40.7	11.0	28.7	60.3	89.0

Source: Department of Defense report of military prime contract awards.

APPENDIX V

Prime Contracts Awarded to Small Business Firms

Information obtained from reports issued by the Department of Defense indicate that although the small business share of procurement actions remains fairly stable, awards to small business firms, both in dollar amount and as a percentage of the dollar amount of awards to all business firms, continue to decrease

from the high levels reached in fiscal year 1966–1967. In fiscal year 1969, small business firms received about $6.5 billion or 17.5 percent of the $41.9 billion of prime contract awards made by the Department of Defense. This amount is down from $7.3 billion (18.4%) received in fiscal year 1968 and from $7.3 billion (21.4%) received in fiscal year 1966. Information is not available as to the percentage of small business participation in subcontract awards.

The fiscal year 1968 decrease in awards to small business firms was largely concentrated in miscellaneous hard goods, e.g., materials handling equipment and photographic equipment and supplies, in clothing and textiles, and in electronics equipment. The fiscal year 1969 decrease in awards to small business firms was also heavily concentrated in miscellaneous hard goods, clothing and textiles. In addition, a significant decrease of $182 million in the purchase of services from small firms resulted from a decrease of about $300 million in such purchases overall. Small firms are more predominant in the above areas of procurement than in the area of major hard goods such as aircraft and missiles.

The overall small business percentage decline attributable to the above factors was offset somewhat by an increase in construction awards which has a favorable rate of small business participation. Department of Defense construction awards increased by $73 million over the last year; however, awards to small business in this area rose by $145 million resulting in a substantially higher ratio of small business participation.

The reports issued by the Department of Defense show that the decrease in dollar awards to small business firms in recent years is largely due to a decrease in Government requirements for the types of goods and services offered by such firms.

The table below summarizes awards to small business firms for fiscal years 1964 through 1969. The source of the information is the Department of Defense report on "Military Prime Contract Awards."

Fiscal year	Prime contract awards (in millions of dollars)		Percentage to small firms	
	All firms	Small	Amount	Actions
1964	28,796	4,519	17.2	68.7
1965	27,997	4,943	19.6	68.5
1966	38,243	7,269	21.4	69.3
1967	44,633	8,073	20,3	68.3
1968	43,756	7,268	18.4	70.0
1969	41,986	6,516	17.5	69.3

APPENDIX VI

Collection of Subcontracting Data

In its May 1969 report on "The Economics of Military Procurement" your Subcommittee recommended that:

"The Defense Department should collect complete data on subcontracting including total amount of subcontracts awarded, competitive and negotiated awards, subcontract profits, type of work subcontracted out, the relationship between the prime contractor and the subcontractors, the amount of business done by the subcontractor for the prime contractor, and compliance with the Truth-in-Negotiations Act. GAO should have access to this information and should make it available to Congress on an on-going basis."

During the June 1969 hearing at which this recommendation was discussed, the Department of Defense said it would look at this area closely over the next several months and institute additional measures, including the collection of additional data, should this prove to be necessary or desirable.

Recently, the Department of Defense advised us that except for data on the total dollar value of the defense small business subcontracting program reported by large military contractors, subcontract data of the type mentioned in the Subcommittee's report are not being collected. We believe this matter could be more fully discussed with the Department of Defense.

Chairman PROXMIRE. I am very pleased at the progress so far of the study of defense profits. One thing, however, does concern me. You state on page 25 that you have developed an audit program designed to look at costs, profits, and invested capital on selected contracts. In other words, in addition to a questionnaire, you will make some audits of individual contracts. How do you plan to make these audits?

Mr. KELLER. We will do it by verification work at the contractors' plants.

Chairman PROXMIRE. Will it be made by the GAO itself?

Mr. KELLER. Yes, sir.

Chairman PROXMIRE. You won't just rely on the Pentagon's audit.

Mr. KELLER. No; I think when a Pentagon audit has been made and it is in, we will look at that but we will test it ourselves. I don't think we want to completely duplicate this work.

Chairman PROXMIRE. I am interested in this because we certainly were warned by Senator Goldwater, who is deeply concerned with the needs of our military force, but he told us that, last June, the GAO seems to be going out of the auditing business and is instead auditing the Pentgon's audits, and I think Senator Goldwater was right, if this is true, in calling it to our attention and complaining about it because we have to rely on you. You certainly have ample manpower; at least you have a lot of manpower.

Mr. KELLER. I might differ with you on the manpower situation.

Chairman PROXMIRE. How many people do you have down there, 4,000?

Mr. KELLER. About 4,500 at the present time but within the accounting and auditing area and other professional about 2,800.

Chairman PROXMIRE. I know these are enormous jobs. This is not at all critical of you because I think you have done extremely well for the taxpayers and for us and you are worth every penny you cost.

Mr. KELLER. We are asking for an increase in this area in our 1971 budget presentation and I hope we are successful.

Chairman PROXMIRE. All right, sir.

Well, Mr. Keller, you and your colleagues from the GAO have done a superlative job this morning and you have been very responsive. I have asked a series of questions that you could not anticipate and you have been excellent, I think, in your knowledge, your competence, and your responsiveness. This has been a most useful and interesting hearing and you have set a fine stage for our subsequent hearings.

Tomorrow we are going to have Gordon W. Rule, who is the Director of Procurement Control and Clearance, Navy Materiel Command Headquarters, and I think the hearing this morning sets the stage for that very well. That will be tomorrow morning at 10 o'clock here in this same room.

The subcommittee will stand in recess until then.

Mr. KELLER. Thank you very much.

Chairman PROXMIRE. Thank you, sir.

(Whereupon, at 12:35 p.m., the subcommittee was adjourned until Tuesday, December 30, 1969, at 10 a.m.)

APPENDIX

(The following memorandum was subsequently supplied for the record:)

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C. August 13, 1969.

Memorandum for Secretaries of the Military Departments.
Subject: Selected acquisition reports/program status reports.

I have completed my review of the first series of Program Status Reports to be submitted to the Chairman, Senate Armed Services Committee. While some corrections must be made to the last five Program Status Reports, upon submission of these reports, 31 of the 33 reports will have been provided to the Committee. The last two, the S3A and the Maverick, will be provided with the reports submitted as of June 30, 1969.

My review of the SARs/PSRs leads me to the conclusion that we must increase top management attention to these reports as well as make some substantive changes in presentation, particularly in the costs section of the report.

I cannot overemphasize the importance of these reports. The Selected Acquisition Report (SAR) is the key recurring summary report from the project managers and the Military Departments to inform the Secretary of Defense on the progress of their major acquisition programs. In turn, the Program Status Report (PSR) is the key vehicle by which the Department of Defense reports to the appropriate Committees and Members of Congress on the progress of selected major weapons systems.

The importance of these reports dictates that we must ensure that the data included are in consistent terms using common base lines, technical data, schedule and cost information. Inconsistencies or errors in data only cause confusion and misunderstandings leading to decreased credibility in our overall management.

I would like to emphasize the need for increased personal involvement in the review and analysis of these reports at the Secretarial level and by all levels of management necessary to ensure that they fairly and accurately reflect the status of the program being reported.

There are several areas of particular concern that have evolved as a result of these first submissions.

1. *Inconsistencies in the program costs section of the reports.*—The May 6, 1969 memorandum of the Secretary of Defense, "Standard Weapons Systems Costs", as amplified by the June 18 memorandum of the Assistant Secretary of Defense (Comptroller), established a uniform Department of Defense policy for reporting the costs of weapons systems. It is absolutely essential that we adhere to the principles stated in these memoranda. I feel that greater publicity must be given to these memoranda both within the Office of the Secretary of Defense and the Military Departments.

2. *Presentation of programs costs.*—A more definitive set of guidelines for stating the cost estimates at particular points in time in the evolvement of a weapons system is required. I expressed some of my thoughts on this subject at a recent meeting concerning the last five PSRs due to be submitted to Senator Stennis. The Assistant Secretary of Defense (Comptroller) has worked with your staff to develop better formats and definitions of costs to be included for the different points in time that weapons systems costs are estimated. I have approved these formats and definitions for the SAR and PSR as attached. *These changes will require submission of supplemental data to the June 30 reports.*

3. *Variance analysis.*—Increased attention is required to more complete explanations and quantifications of the variations between base lines, service

programs and FYDP programs as contained in the reports. I think this same observation is appropriate for all footnotes in the reports—they should be developed from the point of view that the reader does not have the background and technical expertise of the preparer.

4. *Classification of cost growth.*—We must develop and adopt a consistent set of terms to classify the elements of cost growth to assure that we can clearly identify and explain the causes for any increased costs that occur in the future. A task force to study this issue is now working under the direction of the Assistant Secretary of Defense (I&L).

In addition to the points discussed above, the Assistant Secretary of Defense (Comptroller) will shortly be proposing certain revisions to DoD Instruction 7000.3. These revisions will clarify the Instruction and cover many of the areas where deficiencies have been identified.

Now that the first series of reports are substantially completed, I expect that the June 30 reports will reflect significant improvements and request that you take such action as may be necessary to ensure that all necessary improvements are accomplished.

DAVID PACKARD,
Deputy.

DEFINITIONS FOR REVISED PROGRAM COSTS FORMATS

Planning estimate.—Defined in Instructions.

Contract definition plan.—Defined in Instructions.

Program plan.—The planning estimate until approval of the contract definition plan. Thereafter contract definition plan.

Current service program.—The number of units in the military department's inventory objective. This will include the quantities approved by the Secretary of Defense in addition to "outyear" units, if any, to achieve full operational capability.

Quantity.—The number of units divided into RDT&E and Production associated with the individual program cost column.

Program unit cost.—Calculated by dividing the total quantity into the total program costs, both RDT&E and Production. This figure should be rounded to 3 significant digits.

Production unit cost.—Calculated by dividing the production quantity into the total production costs. This figure should be rounded to 3 significant digits.

Program costs—Program cost estimates for RDT&E and production will be reported within the approved individual cost groupings. Costs will be segregated to show those items which are or will be on contract and those non-contractual items. Costs will be defined to include those items covered by the May 6 memo from Sec Def, "Standard Weapons Systems Costs" as expanded by the June 18 memo from ASD(C).

1. *Planning estimate.*—Enter the program cost estimate(s) contained in the program plan as approved by OSD upon completion of concept formulation. (DCP, TDP, etc.)

2. *Contract definition plan.*—Enter the program cost estimate at time of completion of contract definition and/or upon signature of first contract.

3. *Planned costs at current quantity.*—Enter the cost estimates of the program plan adjusted to reflect the changes in quantity between the program plan and the current service program. These adjustments should be based on the cost quantity curves used in the program plan or approximations thereof. The planning estimate will be used as a base for the quantity adjustment prior to the completion of contract definition. After contract definition that plan will be used.

4. *Current estimate total program.*—Enter the current estimates of costs for the current service program. These estimates will be prepared by the project manager and approved by the service chief and the service secretary. They should be objective assessments of program costs. Where costs are protected by contract ceilings they should be indicated. Any evidence of cost overrun must be included at earliest possible date.

5. *FYDP program.*—Enter the current approved program.

6. *Current estimate FYDP program.*—Enter the service estimate to procure the FYDP program.

SELECTED ACQUISITION REPORTS (SAR) PROGRAM COSTS

[In millions of dollars]

Program costs	Planning estimate (date)	Contract definition plan (date)	Planned costs at current quantity	Current estimate, total program	Fiscal year definition plan program	Current estimate, fiscal year definition plan program
R.D.T. & E						
Production:						
1						
2						
3						
Subtotal						
Total program costs						
Quantity:						
R.D.T. & E						
Production						
Total						
Program unit cost						
Product unit cost						

PROGRAM STATUS REPORT (PSR) PROGRAM COSTS

[In millions of dollars]

Program costs	Planning estimate (date)	Contract or definition plan (date)	Planned costs at current quantity	Curren estimate, tota program
R.D.T. & E				
Production:				
1				
2				
3				
Subtotal				
Total program costs				
Quantity:				
R.D.T. & E				
Production				
Total				
Program unit cost				

Note: When the contract definition plan has been approved, the planning estimate column will be dropped from the report.

(The following letter to Senator Proxmire from Mr. Keller was subsequently supplied for the record:)

COMPTROLLER GENERAL OF THE UNITED STATES,
Washington, D.C., December 30, 1969.

HON. WILLIAM PROXMIRE,
Chairman, Subcommittee on Economy in Government, Joint Economic Committee, Congress of the United States.

DEAR MR. CHAIRMAN: You will recall that during my testimony before your Subcommittee on December 29, 1969, concerning cost growth of major weapons systems, I specifically stated that "Of particular significance is the effect quantity or capability increases or decreases have on costs over the life of a program. These often times do vary and do significantly impact on total program cost. A determination of cost growth should take into consideration changes in quantities and capability as well as changes in dollars." See last paragraph on page 8 of my statement.

A specific question has been raised concerning the nuclear powered frigate (DXGN) program which shows a $4 billion increase in cost estimate on the June 30, 1969, Selected Acquisition Report (SAR). It is the Navy's position that this $4 billion increase in the estimate of the future cost of the DXGN program is due to a large increase in the number of ships which the Navy plans to procure and an increase in the weapons capability of the ships; rather than a cost overrun.

The DXGN program as indicated on the SAR for June 30, 1969, shows an original planning estimate of $726.6 million. This was based on five ships of the original conceptual design. No dollar figure is shown on the SAR for initial planning costs adjusted for changes in quantities. The current estimate of the total program is shown as $4,750.09 million. It is understood that subsequent to the original planning estimate the Navy developed a new design for the DXGN with superior weapons capability and has proposed a long range program with many times as many ships. Thus, it is the position of the Navy the increase in cost estimate for the DXGN program is due to the large increase in the number of ships the Navy wants to build and an increase in their weapons capability.

It will be appreciated if this letter is made a part of the hearing record.

Sincerely,

Robert F. Keller,
Assistant Comptroller General of the United States.

REPORT TO THE CONGRESS

Status Of The Acquisition Of Selected Major Weapon Systems

B-163058

Department of Defense

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

FEB. 6,1970

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

B-163058

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on the status of the acquisition of selected major weapon systems of the Department of Defense. Our review was made pursuant to the Budget and Accounting Act, 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Bureau of the Budget; the Secretary of Defense; and the Secretaries of the Army, Navy, and Air Force.

Comptroller General
of the United States

Contents

APPENDIX

V Individual Reports on the Status of the Acquisition of Selected Major Weapon Systems (bound separately)

PART

1 Department of the Army--Aircraft
- CH-47 Helicopter
- CHEYENNE Helicopter
- UH-1H Helicopter
- AH-1G COBRA Helicopter

2 Department of the Army--Missiles
- SHILLELAGH
- SAFEGUARD
- DRAGON
- SAM-D
- LANCE
- TOW

3 Department of the Army--Vehicles
- SHERIDAN Tank
- GAMA GOAT

4 Department of the Navy--Aircraft
- S-3A Aircraft
- F-14 Aircraft
- EA-6 Aircraft
- F-4J Aircraft
- P-3C Aircraft
- CH-46 Helicopter
- A-7E Aircraft

5 Department of the Navy--AN Systems
- AN/SQQ-23 Sonar
- AN/SQS-26 Sonar
- AN/BQQ-2 Sonar

PART

ABBREVIATIONS

ASW	Antisubmarine Warfare
DOD	Department of Defense
GAO	General Accounting Office
RDT&E	research, development, test, and evaluation
SAR	Selected Acquisition Report

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

STATUS OF THE ACQUISITION OF SELECTED MAJOR WEAPON SYSTEMS
Department of Defense B-163058

D I G E S T

WHY THE REVIEW WAS MADE

The General Accounting Office (GAO) examined into the status of selected major weapon systems because of the large acquisition costs involved, and the interest of the Congress in the acquisition of major defense weapon systems.

GAO advised the Chairmen of the Senate and House Armed Services Committees of its plans to give increased attention to the procurement of major weapons systems by letters dated August 1, 1969. (See p. 31.)

GAO plans to continue to monitor the acquisition of major weapon systems. In addition, GAO is considering extending this type of review to other executive agencies.

FINDINGS AND CONCLUSIONS

The Department of Defense (DOD) did not maintain a central file on the total number of systems being acquired or their costs. At GAO's request the DOD attempted to identify this information. Data furnished to GAO as of June 30, 1969, showed that a total of 131 major programs were in various phases of the acquisition process and their total costs were estimated to aggregate about $141 billion. Of this amount, funds proximating $55 billion had been funded to the programs by the DOD through June 30, 1969.

On the basis of a review of the status of 57 major weapon systems, as of June 30, 1969, GAO concluded:

--That considerable cost growth had been and was continuing to occur on many current development programs and that numerous reasons were advanced by the military services to explain them. (See ch. 3.)

--That significant variances either existed or were anticipated between the performance originally expected and that currently estimated for a large number of the systems reviewed. (See ch. 3.)

--That slippage in the originally established program schedules of from 6 months to more than 3 years either had been experienced or were anticipated to be experienced on many of the systems. (See ch. 3.)

Of the 57 systems, GAO obtained sufficient detail on only 38 to permit a comparison of cost estimates at different points in time. GAO found that, on those 38, the current estimates through program completion were about 50 percent higher than the original planning estimates. GAO points out that DOD has recently approved a number of major weapon systems for production and that their initial cost estimates could prove to be greatly understated, should the same rate of cost growth be experienced on these newer systems.

GAO believes that one of the most important causes for cost growth is starting the acquisition of a weapon system before it has been adequately demonstrated that there is reasonable expectation of successful development. Because of the substantial number of cases found, GAO concluded that DOD had not been effectively administering this process.

GAO believes also that another significant cause for cost growth can be traced to the initial definition of system mission requirements and technical performance specifications, including the estimates of costs to achieve them. Improvements in the quality and completeness of such preliminary planning will, in GAO's opinion, provide the knowledge which could contribute substantially to the accuracy of initial cost estimates.

GAO points out that cost growth cannot always be anticipated, particularly where a weapon system is in development and production over a long period of time. Furthermore, it is important to recognize in any analysis or discussion of cost growth that not all cost growth can be reasonably prevented and that some cost growth, even though preventable, may be desirable. (See p. 14.)

GAO concluded that DOD's Selected Acquisition Reporting system, in concept, represented a meaningful management tool for measuring and tracking the progress of major acquisitions. It was initiated in February 1968 and, as with most new management systems, has certain shortcomings. DOD has recognized the need for improvement, and GAO has made specific suggestions to DOD for its consideration in refining the system.

The status of the 57 individual programs as of June 30, 1969, is contained in 10 separate classified volumes designated as parts 1 through 10, which are included as appendix V to this report by reference.

RECOMMENDATIONS OR SUGGESTIONS

During this review the GAO made many recommendations to DOD concerning the improvement of acquisition management. Subsequently, DOD initiated actions to correct, or otherwise deal with, the matters discussed in this report. Therefore, the GAO report contains no specific recommendations. (See chs. 2 and 4.)

AGENCY ACTIONS AND UNRESOLVED ISSUES

Officials of the Office of the Secretary of Defense were generally aware of the matters discussed in this report, and a great deal of attention has been and is continuing to be given to their resolution. A new instruction on the preparation of the SARs was issued by the Secretary of Defense on December 19, 1969. This instruction significantly improves upon the data required to be reported and should greatly enhance the usefulness of the Selected Acquisition Report.

Further experience in the report preparation, together with the clarification provided in the new instructions, should result in the reports being prepared on a more consistent basis.

With regard to the cost growth being experienced, the Deputy Secretary of Defense has acknowledged the need for DOD to focus more attention on identifying the risks associated with major programs and the thorough completion of the established prerequisites to contract definition. A Defense Systems Acquisition Review Council has been recently established to ensure that these prerequisites have been met before programs progress into subsequent phases of the acquisition cycle.

GAO plans to continue to monitor the DOD's acquisition of major weapon systems.

MATTERS FOR CONSIDERATION BY THE CONGRESS

Several committees, subcommittees, and individual members of the Congress have had a long-standing and keen interest in the acquisition of major systems by DOD. (See ch. 5.) This report is being furnished to the Congress to apprise it of GAO's findings and conclusions and for such action as it or its committees may deem appropriate.

CHAPTER 1

INTRODUCTION

In a letter to the Chairman, Senate Committee on Armed Services, dated August 1, 1969 (see app. I), and in similar letters to other congressional committees, we outlined our plans for giving greater attention to the procurement of major weapon systems and for periodically reporting our findings to the Congress. As our initial effort, we decided to examine into the selected acquisition reporting system established by the Department of Defense to monitor and control the acquisition of major weapon systems.

During this examination, we examined into the completeness and accuracy of cost, schedule, and performance information contained in the Selected Acquisition Reports (SARs) as of June 30, 1969, involving 57 major weapon systems. We obtained the most current cost, schedule, and performance information available and made certain comparisons of this information with the initial estimates for each of the systems reviewed.

In undertaking this review in August 1969, we decided to examine the SARs and underlying documentation on a relatively large number of major weapon systems. We, however, confined our examination sufficiently to be able to provide the Congress with this report early in 1970. Therefore our work intentionally was limited in scope. Consequently, this report, for the most part, deals with the apparent problems we identified; it does not include any definite conclusions as to the precise causes or possible alternative remedies.

Additional work is continuing to more fully develop underlying causes of the problems identified and the future improvements that may be needed to ensure the timeliness, accuracy, and adequacy of the data reported under the SAR system. Additional detailed reviews of the problems involved in the acquisition of major weapon systems are also planned.

At the outset of our examination, a complete list of all the major acquisitions was not readily available since a central file was not maintained in DOD. GAO therefore attempted, with the cooperation of DOD, to assemble such a list. We established criteria for our use in defining a major weapon system acquisition to be included in the inventory, which was in general conformance with certain DOD criteria. These were defined as systems expected to require cumulative research, development, test, and evaluation (RDT&E) financing in excess of $25 million, or which were estimated to require cumulative production investment in excess of $100 million. The initial inventory summarized by service and displaying the estimated costs through completion and funds programmed through June 30, 1969, is shown as appendix IV.

Also using the above monetary criteria, we selected systems for our review from systems being procured by each of the military departments that were in various phases of the acquisition cycle (conceptual, developmental, production) and that encompassed a wide range of commodities. Our examination was performed principally at the program/project offices of the military services having responsibility for the system acquisition. Some limited work was performed also at selected prime contractor locations.

The following table indicates, by military department, the resources allocated to the programs reviewed (amounts shown are based on projected service approved programs), their status at the time of our review, and a breakout by commodity class.

	Army	Navy	Air Force	Total
Total number of selected acquisition reports reviewed	13	29	15	57
Status in the acquisition cycle:				
Conceptual phase	-	-	-	-
Development phase	3	9	6	18
Production phase	10	20	9	39
Analysis by commodity category:				
Aircraft	4	7	10	21
Missiles	6	8	5	19
AN Systems (electronics)	-	3	-	3
Ships	-	8	-	8
Vehicles/Ordnance	3	3	-	6
Total estimated cost through completion (millions)	$14,553.5	$47,376.7	$51,750.8	$113,681.0
RDT&E	3,746.4	5,140.8	11,670.8	20,558.0
Production	10,311.7	42,201.3	39,435.6	91,948.6
Military construction	495.4	34.6	644.4	1,174.4

The systems reviewed in our examinations are listed in appendix II.

CHAPTER 2

THE SELECTED ACQUISITION REPORTING SYSTEM

ORIGIN AND PURPOSE

The SAR was established by DOD Instruction 7000.3 of February 23, 1968. Prior to the introduction of the SAR system, there were no summary recurring reports on major system acquisitions which retained consistent cost, schedule, and performance data for comparison with subsequent estimates.

The initial purpose of the SAR system was to keep its sponsor, the Assistant Secretary of Defense (Comptroller), apprised as to the progress of selected acquisition programs and to compare this progress with the planned technical, schedule, and cost performance. In 1969, application of the SAR was broadened and strengthened considerably.

In a memorandum to the Secretaries of the Military Departments dated August 13, 1969, the Deputy Secretary of Defense defined the purpose of the SAR more specifically as being:

> "*** the key recurring summary report from project managers and the Military Departments to inform the Secretary of Defense on the progress of their major acquisition programs."

The Deputy Secretary also emphasized the need for personal involvement of all managers concerned with the major acquisition process to ensure that the SARs fairly and accurately reflect the status of the programs being reported.

Further, the Director, Defense Research and Engineering, in recent congressional testimony, stated that the SARs form the basis for Program Status Reports which are provided to the Senate Armed Services Committee and others on selected major system acquisitions. The Director stated also that the reports should, in part, help DOD improve its monitoring of the progress of development programs and to

identify actual or potential problems in acquiring these major defense systems according to plans and authorizations.

SCOPE AND PROCEDURES

By DOD Instruction 7000.3, the SAR is directed to those systems estimated to require a total cumulative financing for research, development, test, and evaluation in excess of $25 million or cumulative production investment in excess of $100 million. All the defense systems which meet either of these criteria are not necessarily designated for reporting under the SAR system. Designating the programs to be under the SAR is the responsibility of the Assistant Secretary of Defense (Comptroller), in coordination with the Director of Defense Research and Engineering and the Assistant Secretaries of Defense (Installations and Logistics) and (System Analysis).

These same offices also are required to coordinate and approve the specific schedule milestone events, performance characteristics, and cost data to be included in the SARs. These data are selected and submitted to the Assistant Secretary of Defense by the responsible military department upon designation of a system for SAR reporting.

SARs are prepared as of the end of each calendar quarter and are to be submitted to the Assistant Secretary of Defense (Comptroller) within 45 days.

EVALUATION OF THE SAR SYSTEM

The SAR system, in concept, represents a meaningful management tool for measuring and tracking the progress of major acquisitions. At the time of its establishment, the SAR system was intended as an internal DOD information system. Prior to April 1969 the system encompassed only eight acquisition programs and was, for all practical purposes, an experimental effort. In April 1969 the system was chosen by DOD to play an important role in the monitoring of system acquisitions and also as the mechanism for developing program status information requested by the Senate Preparedness Investigating Subcommittee. Consequently the number of programs designated for the SAR system increased from eight to more than 50 programs as of June 30, 1969.

As with any new reporting system, the SAR system had serious shortcomings and there are several areas where improvements are essential.

At the time of our examination, the SAR was not sufficiently encompassing, and therefore failed to disclose, significant matters concerning the progress of major acquisitions. For instance:

1. Although appraisals of certain specified technical features of the systems are required (weight, range, speed, accuracy, etc.), the results of a comparison of the technical performance actually demonstrated with that specified in the contract were not required to be reported.

2. In certain reports the status of certain key subsystems was not required to be reported. Most frequently these concern schedule and technical information on Government-furnished equipment. Additionally, it was noted that in certain instances end-items were delivered without critical components and no mention was made in the reports.

3. Cost incurred in relationship to the cost that should have been incurred for the physical progress of the work attained at a particular point in time was not reported.

4. Significant pending decisions that may have a major impact on the program, such as changes in quantities or deliveries, were not reported.

5. A comparison of quantities delivered with those scheduled to be delivered at the same point in time was not made.

We also noted inconsistencies in the data reported in the SARs. For example, there was a lack of consistency in (1) the reporting of early developmental costs, (2) treatment of costs attributed to inflationary trends in the economy, (3) treatment of costs involving contract incentive/penalty provisions and claims for equitable adjustments, and (4) the reporting of costs involved in modifying an

existing system to accommodate a new subsystem. In addition, many reports were very voluminous and in such detail that sheer volume of paper rendered a ready analysis of the status and progress of the system an extremely difficult task.

DOD is aware of many of these problems and shortcomings, and a great deal of attention has been and is continuing to be given to their resolution. A new instruction on the preparation of the SARs was issued by the Secretary of Defense on December 19, 1969. This instruction significantly improves upon the data required to be reported and should greatly enhance the usefulness of the SAR. For example, the instruction specifically deals with many of the shortcomings discussed above. Further experience in report preparation, together with the clarification of the new instructions, should result in the reports' being prepared on a more consistent basis.

With regard to the costs attributed to inflation, DOD advised us that a Government policy had not yet been determined on the treatment of estimations of costs attributed to inflationary trends in the economy and that efforts were under way to study the issue.

41-698 O - 70 -pt. 1 - 7

CHAPTER 3

COST, SCHEDULE, AND PERFORMANCE

Numerous reasons for changes to original program plans were contained in the SARs. Additional insight as to reasons for changes was gained by us as a result of evaluation of individual reports and discussions with the persons responsible for the programs. The data we collected during our review were analyzed by the three basic performance indicators--cost, schedule, and technical performance.

Each of these indicators is discussed separately in this chapter. Our findings regarding the adequacy of the variance analysis shown in the SAR are also included in this chapter.

EXPERIENCE WITH SYSTEM COST ESTIMATES

DOD instructions require that estimated program cost data be displayed in columnar form on the SAR to show:

1. Planning estimate.
2. Contract definition cost estimate.
3. Earlier estimates adjusted for quantity changes.
4. Current estimate through program completion.

The planning estimate appearing on the SAR is the formal estimate prepared by the military department, and approved by the Secretary of Defense, of cost anticipated to acquire the system in the quantities needed. It is prepared prior to the initiation of the formal acquisition cycle, i.e., prior to contract definition, and usually serves as a basis for initial appropriation requests.

Contract definition cost estimates are refinements of the initial planning estimates and are established during the contract definition phase in which preliminary design and engineering are verified or accomplished and contract and system management planning are performed. This cycle frequently extends over a period of a year.

Item 3 above is shown as planned costs at current quantities on the SAR. We have changed this column heading to show that costs have been adjusted for quantity changes. If there is not a change in quantity, this column would be the same as either the planning estimate or the contract definition estimate column depending on the acquisition phase of the system.

The current estimate through program completion is intended to be a current, objective estimate of the costs expected to be incurred to accomplish the entire program and is adjusted for such items as changes in quantity as well as current estimates of cost due to inflation, changes in scope, capability increases, and program stretch-outs.

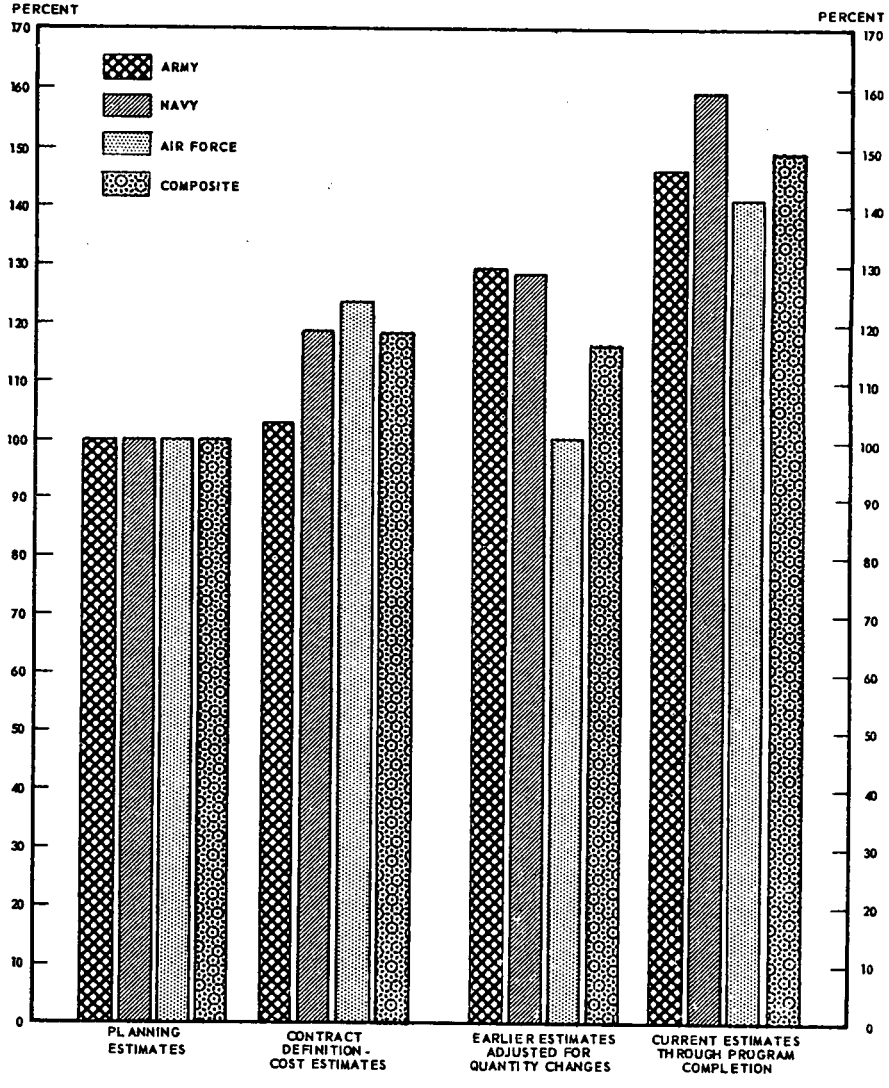
Of the SARs we reviewed, only 38 of the systems that had advanced to engineering or operational systems development provided sufficient cost detail to permit a meaningful evaluation of estimated cost performance. The results of this evaluation are shown in the following tabulation.

SAR Cost Estimates as of June 30, 1969

Number of systems	Planning estimate	Contract definition estimate	Earlier estimates adjusted for quantity changes (note a)	Current estimate through program completion
	(millions)			
Army (8)	$ 5,914.2	$ 6,087.7	$ 7,679.9	$ 8,654.5
Navy (22)	18,042.4	21,444.0	23,220.9	28,758.9
Air Force (8)	18,009.9	22,309.6	18,166.8	25,475.9
Total (38)	$41,966.5	$49,841.3	$49,067.6	$62,889.3

[a]The SAR heading for this column is Planned Costs at Current Quantity.

COMPARISON OF PROGRAM COST ESTIMATES



This chart shows that current estimates through program completion have grown about 50 percent when compared with planning cost estimates for these programs. It shows also that, although cost estimates improve and increase as a result of contract definition, they still, when measured from earlier estimates adjusted for quantity changes, do not approximate the current estimates to complete total programs.

Furthermore, it is important to recognize in any analysis or discussion of cost growth that not all cost growth can reasonably be prevented and that some cost growth, even though preventable, may be desirable. Unusual periods of inflation, for instance, may result in cost growth. Changes in technology may make it possible to incorporate modifications that result in an overall increase in the cost effectiveness of the system.

Such cost growth cannot always be anticipated, particularly where a weapon system is in development and production over a long period of time. However, cost growth may also result from such things as faulty planning, poor management, bad estimating, or deliberate underestimating. At the time of our review, the SAR system did not require any specific identification of the program cost variance in explicit terms. We were therefore unable to segregate cost growth by its various causes.

SUFFICIENCY OF COST VARIANCE ANALYSES

Making a meaningful analysis of the systems costs from the information shown on the SARs has been a most troublesome task. The instructions for preparation of the SAR require a written analysis of any significant variance between program estimates at specified periods of time or milestones. The reason stated for the analysis is to provide persons unfamiliar with these basic data with the reasons for the variances.

The variance analyses of cost growth were often vague, and less than half of these analyses attached monetary value to the variances. Many SARs failed to give the causes for cost growth and provided reasons that were more symptomatic than informative. Explanations were brief and seldom provided an insight into the effect of these problems on the total program in relation to cost or in relation to subsystems or components scheduled to be a part of the overall system. More importantly, the impact on the timeliness and suitability of the system in relation to mission objectives was not explained. As a result, the variance analyses did not, in our opinion, adequately serve their intended purpose.

The following examples are illustrative of the incompleteness of variance analyses for cost growth which, we believe, restricts the usefulness of the SAR.

A Navy system in our review is currently estimated to experience a 192-percent cost growth beyond original planning estimates. Although many reasons were cited for this cost growth, it appears that a basic reason not fully disclosed on the SAR is that the Navy and the contractor did not initially have an adequate basis for projecting costs because requirements were not properly defined and, in some instances, represented technological unknowns.

In another instance, the SAR showed a cost growth for an Army vehicle as a result of a capability increase. Our review revealed that in this instance the capability increase was a by-product resulting from a correction of the system to overcome shortcomings which were not resolved prior to entering the production phase of the contract.

POTENTIAL FOR COST GROWTH

Estimates of cost growth addressed in this report excluded a number of major systems which were too early in the acquisition process to show, or realistically forecast, cost growth. For instance, the B-1, DD-963, DXGN, F-15, and AWACS systems, with a current estimate through program completion of about $27.3 billion at June 30, 1969, had not gone through contract definition, and cost estimates resulting from this process were not available at the time of our review. Additionally, the June 30, 1969, SARs show that a number of other major systems--including SAFEGUARD, S-3A, F-14, and MINUTEMAN III, with a current estimate through program completion of about $17.7 billion--have recently been approved for production.

Should the cost growth experienced on the older programs be approximated on the newer ones, the estimates shown above could prove to be greatly understated.

SYSTEM SCHEDULE EXPERIENCE

Our examination of the system milestones schedules as reported on the SARs at June 30, 1969, showed that 34 of the 57 systems we reviewed either had experienced or were expected to experience slippage in the originally established program schedules of from 6 months to more than 3 years. Eleven other systems we reviewed were in the early phases of the acquisition process and therefore no schedule slippages were reported on the SARs for those systems. An additional 12 SARs reported either no slippage or slippage of less than 6 months.

The following schedule shows the extent of actual or anticipated slippage as reported on the SARs by the military services. We selected the scheduled date of deployment or a comparable milestone as a base of measurement.

Slippage	Number of systems
6 months to 1 year	8
1 to 2 years	10
2 to 3 "	8
Over 3 "	8

Our analysis of the SARs showed that over 20 different reasons were cited as explanations for the slippages. Those most frequently cited were problems related to development, funding, production, system design and contract changes, and overly optimistic original schedule estimates. Among the other reasons cited were delays in associated programs, strikes at contractor plants, problems arising from the Southeast Asia conflict, program stretch-outs, and late availability of Government- or contractor-furnished equipment.

Generally, explanations provided on the SARs for failure to meet schedule milestones were brief and seldom gave any indication as to the basic cause or indicated whether the Government or contractor was primarily responsible. Further, the SAR explanation seldom indicated the significance of delays in relation to the impact on the total program costs or effects on other related ongoing programs.

Specific reasons for failures to meet schedules were provided in some SARs which we examined. Some also showed how slippage in other programs affected scheduled events in the subject programs. For example, in the schedule variance analysis section of one SAR, the extent of slippage was identified with the following reasons.

--4 months' slippage due to specific modification to original contract plans by the Government.

--5 months' slippage due to late availability of another major system.

--7 months' slippage due to late receipt of working drawings.

--8 months' slippage due to late contractor material deliveries.

The disclosure of causes and indication of the amount of slippage attributable to a specific cause, as shown above, provide a basis for more meaningful analysis of the SAR reports. We found, however, that the SARs usually were not that explicit. For example, in one SAR we examined, a funding problem was cited as a reason for schedule slippage. In our opinion, this type of information without an accompanying explanation of why funding is a problem is not very meaningful. The SAR did not disclose whether the service failed to request sufficient funds or reprogrammed funds, whether development problems may have led DOD or the Congress to withhold funds, or whether higher priorities may have been involved.

We find that the SARs often do not indicate the relative significance of the reasons cited. For instance, in the above example, in addition to funding as a problem, the SAR cites design and technical difficulties and delays in an associated program as the reasons for slippage of about 3 years. Each appears to carry equal weight. However, our review of records, other than the SAR, showed that the lack of funding had a very significant impact in that it was cited as the cause of a 2-year delay in the start of operational testing.

We believe the SARs, particularly those for systems in early phases of the acquisition process, should show:

--basic causes of any slippage,

--whether the Government or contractor was responsible, and

--the significance of the cause in terms of time, money, or effect on other programs.

SYSTEM PERFORMANCE

In our analysis of the system performance data being reported in the SARs and their related supporting documents and in discussions with responsible project office officials, we found that significant variances either existed or were anticipated between the performance originally expected and that currently estimated for a large number of the systems.

The variances represented improvements and/or degradation in system performance. In some instances improvements in one capability resulted in a degradation of other expected capabilities. The 57 SARs in our review can be generally placed in the following categories.

Variances from original plan	Number of systems
Improvement in system performance	3
Degradation in system performance	12
Both improvement and degradation in system performance	17
No significant variances cited on SARs	25

Reasons cited for the variances were many and varied and usually did not provide explanations that would be meaningful to one who lacked the expertise to visualize the impact of the variance in relation to total system performance and mission objectives. Some reasons were common among several systems; others were unique to a particular system. We have attempted to identify the reasons for the significant performance variances, and we find that they fall under three principal categories; namely (1) desire to upgrade performance and reliability as technological advancements are recognized, (2) inaccurate or overly optimistic estimates of performance, and (3) changed design to increase capability and/or correct deficiencies.

Three of the systems we looked at experienced significant improvements in performance beyond original expectations. These improvements were attributed to breakthroughs in technology during the acquisition process. As these technological advancements were recognized, they were built into the systems. For example, one SAR indicated that the

range of a sonar used in submarine detection was improved as increased knowledge of sonar performance evolved during development.

We also found that 12 of the systems included in our review had experienced or expected a degradation of system performance from that originally estimated. However, this information was not always properly identified on the SAR reports. For instance, we found in one case that some of the original objectives of an aircraft system were beyond the state of the art and that subsequent changes to the system to overcome the associated problems did not bring the capabilities up to the original expected performance. In this instance the SAR showed that the variances were primarily attributed to fuel consumption and weight growth.

We found that, in the improvement and degradation category, 17 systems realized improvements to some performance characteristics and at the same time experienced degradation to other characteristics. Our analyses of the SAR data indicated that these performance changes in capabilities generally were made to increase the overall capability of the system over that initially planned or to correct recognized deficiencies to keep the system from falling below desirable performance capabilities. As an example of the latter, the gun/launcher system of a vehicle was modified at considerable cost and delay so that it could fire the ammunition developed.

No significant performance variances were reported on the SARs for 25 systems, nor did we identify any variances in our review.

CHAPTER 4

SUMMARY OBSERVATIONS AND CONCLUSIONS

Although this review has been concerned primarily with an evaluation of the SAR system concepts and the adequacy and accuracy of individual system reports, our examination also included some consideration of underlying documentation relating to the causes for cost increases, schedule slippages, and changes in systems performance. Our desire to review as many programs as we could within the time available did not afford us the opportunity to fully interpret these factors. However, a considerable amount of data was compiled from which certain conclusions are obvious and should, appropriately, be included in this report for consideration and positive action by DOD.

Our review showed that considerable cost growth had occurred, and is continuing, on many current development programs and that numerous explanatory reasons were advanced. The scope of our review did not permit a complete identification of fundamental causes of cost growth. The work we did accomplish, however, convinced us that the data brought to light through the SAR we reviewed were insufficient to provide DOD with precise causes for this cost growth. On the basis of these same explanations, we believe that increased attention must be given to the problem of identifying separately:

1. Those cost growth items which, in fact, are not entirely controllable by DOD, such as inflation, or those items which may even be desirable and which may be expected to continue, such as upgrading system performances.

2. Those items which are stated to be major causes for cost growth and which are, in fact, explanations of symptoms of cost growth, such as corrections of erroneous estimates or assumptions.

3. Those items which are basic causes for cost growth and which could be eliminated or reduced considerably by appropriate and effective DOD action, such

as commencing full development of a new system even though substantial additional work is required, in the prior conceptual phase.

We have listed below several items which should be considered seriously by DOD as potential areas for immediate remedial action in order to improve the acquisition process. Most of the significant causes for cost growth in a system appear to be caused by events and decisions during the early phases of contract definition and its follow-on engineering development. Decisions then are most influential, since they affect the program throughout the acquisition cycle and therefore contribute to, or preclude, later substantial cost growth.

One of the most important causes for cost growth is that decisions are made to begin the process of initiating a program before it has been demonstrated adequately that the prerequisites for advancing into the contract definition phase have been satisfied. A substantial number of examples of cost growth indicate that DOD has not been administering this process effectively. A substantial number of reasons for cost growth would not exist on current programs if the prerequisites had been met prior to initiation of contract definition and the subsequent phase of engineering development.

Another significant cause for cost growth can be traced to the initial documents which define system mission requirements and technical performance specifications, including the estimates of costs to achieve them. Although it is recognized that there are practical limitations in defining precisely requirements and specifications for new weapon systems, the technical performance and related system and subsystem specifications are a part of the fundamental basis for program approvals, estimates, and contracts and even for later developmental progress evaluations. Improvements in the quality and completeness of such documents will, in our opinion, provide the knowledge which could contribute substantially to a reduction in subsequent program cost growth.

We found that DOD was aware of these problems and was endeavoring to solve them. For example, we learned during

our examination that the Deputy Secretary of Defense, in July 1969, recognized the need for DOD to focus more attention on identifying the risks associated with major programs and the thorough completion of the prerequisites to contract definition that had been established. The Secretary of Defense also is aware of the need to eliminate overoptimism in cost estimates for major systems. Action taken and attention directed toward these problems should result in their resolution and therefore are supported by the Secretary of Defense. Additionally, a Defense Systems Acquisition Review Council has been recently established to ensure that the necessary prerequisites have been met before programs progress into subsequent phases in the acquisition cycle.

Although a formal directive governing its preparation has not been issued, we understand that the Development Concept Paper system is to be used extensively by DOD to achieve an optimum definition of a program (including cost) consistent with its stage of development.

With regard to the SAR system itself, we feel that many of the shortcomings we identified in our examination will be overcome by the additional guidance that DOD issued in December 1969. (See ch. 2.) Because of the significance of the SARs, we feel also that some real effort on the part of DOD, and at all levels in the military services, is needed to shape the content of the SARs so that the reports will focus attention on the overall status of a system, including the interrelationships among all aspects of the programs, existing or potential problems affecting it, and actions required to cope with them.

GAO plans to continue to monitor the DOD's acquisition of major weapon systems.

CHAPTER 5

CONGRESSIONAL CONCERN OVER ACQUISITION OF MAJOR SYSTEMS

In recent months a number of committees and subcommittees of the Congress, including many of its individual members, have expressed concern over problems involved in the acquisition of major weapon systems by DOD. A number of hearings have been held in which problems being experienced with the individual systems have been given special attention.

A number of amendments were introduced to the fiscal year 1970 Defense Authorization Bill in which concern over the acquisition of weapon systems was expressed and proposals were made to enable the Congress to discharge better its responsibility in connection with funds used to acquire such systems by the military departments.

Although we are unable to include all expressions of congressional concern, we believe that the following statement conveys the general congressional feeling.

The Subcommittee on Economy in Government in its report (91st Cong., 1st sess.) of May 22, 1969, stated:

> "The Federal Government has not been adequately controlling military spending. As a result, substantial unnecessary funds have been spent for the acquisition of weapons systems and other military hardware. Mismanagement and laxity of control over this expensive program are creating heavy burdens for every taxpayer. *** Presently we do not have sufficient information about much of the procurement process including profitability, status of program costs, overruns, subcontracting, military prices, cost allocation, performance, ***."

The Armed Services Investigating Subcommittee, House Committee on Armed Services, in its report of June 24, 1969,

entitled "Review of Army Tank Program" took note of the delays in deploying equipment funded through the Army's tank improvement program as follows:

> "The Army has requested and received funds for its tank improvement program ever since 1961. However, in recent annual reviews of this program, the Armed Services Committee noted that the Army still has not deployed this equipment to the field. Slippages in deployment plans, as high as five years, had occurred."

In addition, it was added that:

> "Despite continuing development failures, production decisions on almost every one of the items covered by this report were made so that appearance of satisfactory program progress would lessen the chance of searching and critical reviews by 'those who control funds' in the Office of the Secretary of Defense and the Bureau of the Budget."

The Senate Committee on Armed Services in its Report 290, on the Defense Authorization Act (91st Cong., 1st sess.) of July 3, 1969, stated:

> "The committee is greatly concerned over the increased cost of new weapon systems generally, and the fact that certain weapon systems now in procurement or development have greatly exceeded their original cost estimates.
>
> "The Committee on Armed Services wishes to make it clear that it considers it has the responsibility and duty to extend beyond the passage of the authorization legislation to closely oversee the military expenditures as these funds are spent on the various weapons systems."

The House Committee on Appropriations, in its Report 1735 (90th Cong., 2d sess.) of July 18, 1968, found that:

41-698 O - 70 - pt. 1 - 8

> "*** examples of waste and mismanagement continue to persist in the operations of the Department of Defense. It is inevitable that in an operation so vast and far flung waste and mismanagement will occur ***"
>
> "It is true that many examples of waste which have come to the attention of the Committee do not loom large in terms of a $77 billion Defense budget, but taken in the aggregate, they are significant, and the fiscal situation demands--even more so than in previous years--that greater efforts be exerted toward streamlining and improving Defense operations."

Most recently, the House Committee on Appropriations in its Report 698 (91st Cong., 1st sess.) of December 3, 1969, observed:

> "While the Committee has consistently inquired into cost overruns from year to year, no single year stands out in which inordinate escalations in costs for Defense weapon system developments and procurements have been surfaced to the extent they have been this year during the hearings. *** This situation has greatly disturbed the Committee and it most certainly has an unfavorable impact upon the American taxpayer. Although general inflationary trends in recent years have been a factor in contributing to the problem of cost increases, economic changes accounted for only 11.4 percent of the total cost increases identified. It can be said that cost overruns in fact have contributed to inflation."

The military procurement authorization for fiscal year 1970 was scrutinized by members of the Congress, and a number of amendments were proposed in an effort to institute improved reporting of major acquisitions. Among the amendments that were adopted was one which requires the Comptroller General to audit, independently, major contracts and report his findings to the Congress.

CHAPTER 6

AVAILABILITY OF INFORMATION REQUESTED BY THE GENERAL ACCOUNTING OFFICE

The expressed congressional desire for GAO to furnish it with data on the status of weapon systems timely made it absolutely essential that delays in obtaining access to needed information be minimized to the greatest possible extent.

At the outset of this review a series of meetings were held between senior officials of GAO, the Secretary of Defense, and other top Defense officials to apprise them of the nature of the assignment and the time constraints on their performance. Defense officials recognized the significance of the assignment as well as our need for timely access to data and assured us of their full cooperation in making needed data readily available.

After the fieldwork on this assignment started, a series of problems with access to data began to develop. Another series of meetings were held with departmental officials, culminating in the issuance of a special memorandum by the Deputy Secretary of Defense specifically granting our Office access to the documentation underlying the SARs. For the most part, this substantially alleviated the problem. As the fieldwork progressed, however, the provisions of an Air Force regulation, governing relationships between GAO and the Air Force, proved to be subject to varying interpretations, and as a result substantial delays in obtaining data from that service were experienced.

When the full impact of these delays was made known to the Headquarters, Air Force, the Chief of Staff promptly issued a new instruction clarifying the types of data that should be made immediately available to our Office and promised a review and revision of the Air Force regulation on this subject. The action taken by the Air Force Chief of Staff has resulted subsequently in full and timely availability of the required data to us. The planned revision of the Air Force regulation should materially reduce the incidences of these kinds of difficulties.

APPENDIXES

COPY

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

B-163058

August 1, 1969

Dear Mr. Chairman:

As you know from our recent discussions, the General Accounting Office is planning to give increased attention to Defense procurement, with particular reference to the procurement of major weapon systems. This area has long been an important one for the General Accounting Office, but I believe that it deserves increased attention in view of the fact that more than one-third of the Defense budget is devoted to procurement.

Assuming the Congress acts favorably upon the 1970 budget request for the General Accounting Office, we anticipate increasing the staff devoted to Defense procurement from an average of 250 to 425 employees. This increase will be allocated principally to the acquisition of major weapon systems by the Department of Defense where we will give particular attention to the following:

1. Possible improvements in cost estimates at the time the authorization request is presented to the Congress.

2. Providing greater assistance to the Armed Services and Appropriations Committees in the timeliness and completeness of information on the status of major weapon systems.

3. Reviewing and presenting to the Congress on a selective basis major problems identified which may be of assistance to the Congress in acting on future appropriations and authorizations for major weapon systems.

As you know, the Department of Defense is improving its information reporting on major weapon systems through its Selected Acquisition Reporting System. We understand this information will contribute to and supplement the action of the Senate Armed Services Committee, already underway, to develop a reporting system to keep the Committee advised on the status of weapon system acquisitions. The GAO proposes to work with the Armed Services Committees, the Appropriations Committees, and the Department of Defense in developing a system which will assist in meeting the needs of the Congress. Subsequently, the GAO proposes to review from time to time the operation of the reporting system from the standpoint of improvements which may be needed to assure its timeliness, accuracy, and adequacy.

Tentatively, the GAO proposes to submit to the Congress at the beginning of the congressional session and at such later points in time

as might be useful during the period when authorizations and appropriations are under consideration, status reports on major weapon systems, excluding those systems which are substantially completed. To the extent practicable, the GAO hopes to come into agreement with the Department of Defense on cost definitions. The General Accounting Office will advise the Department of Defense of the weapon systems to be included in the report for this purpose at an early date. It will also be necessary to reach agreement between the Department of Defense and the General Accounting Office on access to records. In addition, there should be discussions on the classification of data and the handling of such data in GAO reports which is classified in nature.

Detailed reviews of the problems involved in acquisition of weapon systems will give first priority to the requests of authorizing and appropriating committees. For example, the GAO has been requested by the Senate Armed Services Committee to provide information for the Committee with respect to the CHEYENNE Helicopter, the CONDOR, and the SRAM. The GAO will advise the Department of Defense of future similar requests when received or of additional reviews initiated within the discretion of the GAO.

Preliminary plans of the GAO contemplate that its reports on major weapon systems will include the following:

1. Currently estimated costs compared with the prior estimates separately for (a) research, development, and engineering, and (b) production.

2. The reasons for any significant increase or decrease from cost estimates at the time of the original authorization and the original contract.

3. Options available under the contract for additional procurement and whether the agency intends to exercise any options, and the projected cost of exercising options.

4. Changes in the performance specifications or estimates made by the contractor or by the agency and the reasons for any major change in actual or estimated differences from that called for under the original contract specifications.

5. Significant slippages in time schedules and the reasons therefor.

We are aware that several legislative proposals have been advanced to provide for differing types of reports and reviews by the General Accounting Office relating to the Defense procurement, with particular

reference to weapon systems. Before legislation of this type is enacted, it would be our recommendation that the most careful consideration be given to it by the Congress. The type of reviews made by this Office and the needs of the interested committees of the Congress need further development and exploration. For these reasons, we believe that legislation prescribing a particular form of reporting at this time would be unwise. In general, we believe that the basic authority of the General Accounting Office is adequate to carry out the program which we have outlined.

I am sending a similar letter to the Chairman of the House Armed Services Committee.

I have previously advised in testimony before the House and Senate Appropriations Committees of our general plans to increase our effort in the Defense procurement area.

Best wishes.

Sincerely,

(Signed) ELMER B. STAATS

Elmer B. Staats

The Honorable John C. Stennis
Chairman, Committee on Armed Services
United States Senate

Note: A similar letter was also sent to the Chairman, Committee on Armed Services, House of Representatives.

APPENDIX II
Page 1

LIST OF WEAPON SYSTEMS SELECTED FOR GAO STUDY

System	Mission	Status
DEPARTMENT OF THE ARMY:		
Aircraft:		
CH-47	Cargo helicopter	Production
Cheyenne helicopter	Close in ground support/troop transport convoy escort	Production-canceled
UH-1H helicopter	Tactical transport helicopter	Production
AH-1G Cobra helicopter	Attack helicopter	Production
Missiles:		
Shillelagh	Surface-to-surface antitank missile-main armament of the Sheridan tank	Production
Safeguard	Antiballistic missile	Operational system development
Dragon	Surface-to-surface missile destruction of armored vehicles and other hard targets	Development
SAM-D	Surface-to-air missile--field army air defense system	Advanced development
Lance	Artillery support	Engineering development
Tow	Destruction of armored and field fortifications--surface-to-surface air-to-surface guided missile	Production
Vehicles--Ordance:		
M-551 Sheridan tank	Armored reconnaissance/airborne assault vehicle	Production
M-561 Gama Goat	Vehicle to provide mobility for troops and equipment	Production
DEPARTMENT OF THE NAVY:		
Aircraft:		
S-3A	Carrier-based ASW aircraft	Development
F-14	All-weather fighter	Development
EA-6	ECM attack aircraft	Production
F-4J	All-weather fighter	Production
P-3C	Patrol ASW aircraft	Operational
CH-46	Assault/transport helicopter	Operational
A-7E	Light attack aircraft	Operational
AN systems:		
AN/SQS-23	Sonar for surface ship detection and tracking of submarines	Preproduction contract awarded
AN/SQS-26	Sonar for surface ship detection and tracking of submarines	Production
AN/BQQ-2	Sonar for nuclear submarines	Preproduction contract awarded
Missiles:		
Phoenix	Long-range air-to-air missile	Prototype production
Poseidon	Nuclear-guided missile	Production
Walleye	Air-to-surface missile	Development
Condor	Air-to-surface missile	Development
Standard Arm	Air-to-surface missile	Production
Subroc	Underwater-to-air-to-underwater nuclear depth missile	Production
Sparrow E	Air-to-air all-weather missiles	Operational
Sparrow F	Air-to-air all-weather missiles	Development
Ordnance:		
Mark 46 torpedo	Antisubmarine warfare	Production
Mark 48 model 0 torpedo	Antisubmarine warfare	Development

LIST OF WEAPON SYSTEMS SELECTED FOR GAO STUDY (continued)

System	Mission	Status
DEPARTMENT OF THE NAVY (continued):		
Ordnance (continued):		
Mark 48 model 1 torpedo	Antisubmarine warfare	Development
Ships:		
LHA amphibious assault ship	Deployment of marine expeditionary forces in amphibious assaults	Construction
CVA-67 aircraft carrier	Attack carrier	Completed
CVAN-68 aircraft carrier (nuclear)	Attack carrier	Under construction
CVAN-69 aircraft carrier (nuclear)	Attack carrier	Partially funded (long lead-time items)
DE-1052 class, escort ship	Locate and destroy hostile submarines	Under construction or completed (46 ships)
DD 963	Fleet escort destroyer	Contract definition
DXGN, new guided missile frigate	Fleet escort destroyer	Contract definition
SSN attack submarine (nuclear)	Tracking and destroying enemy submarines	Completed or under construction (37 ships)
DEPARTMENT OF THE AIR FORCE:		
Aircraft:		
AMSA (advanced manned strategic aircraft)	Destruction of strategic targets with nuclear conventional ordnance; replaces B-52 bomber	Concept formulation
F-15	Air superiority fighter	Contract definition
C-5A	Designed to carry large payloads and outsized cargo over long ranges for MAC	Early production and flight testing
F-111, FB-111, and RF-111	Tactical support, strategic bombing, fleet air defense, air superiority, reconnaissance	Production
A-7D	Fixed wing, subsonic, light attack	Production
AWACS	Provide airborne early warning of a bomber threat and command/control of tactical interceptor force	Engineering development
F-4E	All-weather fighter	Production
RF-4C	All-weather reconnaissance aircraft	Production
Missiles:		
Maverick	Destruction of tactical ground targets	Development
Titan III	Space launch vehicles	Development essentially complete, 3 versions in production
SRAM	Air-to-surface missile to strike primary targets and suppress antibomber defenses	Advanced engineering development
Minuteman II and III	Destruction of strategic ground targets at intercontinental range	Production

APPENDIX III
Page 1

SCHEDULE OF PROGRAM COST DATA APPEARING
ON JUNE 30, 1969, SARs (note a) AND ARRANGED BY
ACQUISITION PHASE AND MILITARY SERVICE

	Planning estimates	Contract definition cost estimates	Earlier estimates adjusted for quantity changes	Current estimates through program completion
	(millions)			
CONCEPT FORMULATION:				
None of the 57 systems are in this phase as of 12-23-69				
CONTRACT DEFINITION (7):				
Army				
Navy:				
DD963	$1,396.55		$1,737.55	$3,350.3
CVAN 69	519.0		519.0	-
DXGN	726.6		-	4,750.09
Air Force:				
B-1	8,800.0		8,800.0	8,800.0
F-15	6,039.0		6,039.0	7,700.0
AWACS	2,652.7		2,652.7	2,652.7
RF-111D	579.4		542.1	895.7
ENGINEERING AND/OR OPERATIONAL SYSTEMS DEVELOPMENT (50):				
Army:				
Dragon (note b)	381.3	$ 425.5	464.4	832.8
Shillelagh	373.1	373.1	380.3	573.2
AH-1G	49.8	70.7	466.2	561.0
Safeguard	4,185.0	4,185.0	4,185.0	4,185.0
Gama Goat	69.1	168.1	369.2	373.6
Sheridan tank	388.7	398.1	548.0	689.6
Cheyenne	125.9	125.9	125.9	203.9[c]
UH-1H	341.3	341.3	1,140.9	1,235.4
TOW (notes d and e)	410.4	-	366.8	944.7
Sheridan Ammo (notes d and f)	370.1	-	-	489.0
CH-47 helicopter (note d)	-	-	-	1,323.7
Lance (note d)	543.8	-	421.9	472.3
SAM-D (notes d and g)	4,816.5	3,910.0	-	3,372.1
Navy:				
P-3C	1,294.2	1,294.2	2,265.3	2,261.7
AN/BQQ-2	126.9	179.0	178.5	269.9
Sparrow E.	687.2	740.7	265.6	258.1
Sparrow F.	139.8	393.0	246.3	425.9
Phoenix	370.8	469.0	529.5	1,022.3
Mark 46-Mod 1	347.0	1,033.6	1,021.6	1,039.9
Mark 48-Mod 0	682.4	700.3	715.3	3,890.7
EA 6B	689.7	817.7	793.7	1,034.9
Walleye II	345.3	345.0	123.9	134.6
F-14	6,166.0	6,166.0	6,166.0	6,373.0
Standard Arm	180.3	241.6	220.0	250.7
S-3A	1,763.8	2,891.1	2,891.1	2,891.1
AN/SQQ-23	160.2	175.6	116.6	321.7
A-7E	1,465.6	1,465.6	1,421.5	1,919.1
Mark 48-Mod 1	70.7	71.6	71.6	111.1
Condor	117.2	126.0	126.0	167.0
F-4J	770.0	770.0	2,509.6	2,743.7
AN/SQS-26CX	95.7	88.8	95.6	119.6
CH46 E/F helicopter	323.6	589.0	577.1	550.6

SCHEDULE OF PROGRAM COST DATA APPEARING

ON JUNE 30, 1969, SARs (note a) AND ARRANGED BY

ACQUISITION PHASE AND MILITARY SERVICE (continued)

	Planning estimates	Contract definition cost estimates	Earlier estimates adjusted for quantity changes	Current estimates through program completion
	(millions)			
ENGINEERING AND/OR OPERATIONAL SYSTEMS DEVELOPMENT (50) (continued):				
Navy (continued):				
LHA	$ 651.0	$1,346.5	$1,346.5	$1,379.4
DE-1052	1,285.0	1,259.7	1,259.7	1,286.1
CVA-67	310.0	280.0	280.0	307.8
CVAN 68 (note d)	427.5	427.5	427.5	-
Poseidon (note d)	-	4,384.0	-	5,602.0
Subroc (note d)	-	438.8	455.3	591.4
SSN 637 (note d)	-	-	2,515.8	2,838.9
Air Force:				
Minuteman II	2,872.5	4,164.2	4,168.2	4,280.7
Minuteman III	2,678.1	4,339.0	4,060.3	4,226.0
C-5A	3,423.0	3,370.0	3,370.0	4,832.0
Maverick	257.9	391.8	213.1	374.7
A-7D	1,378.1	2,012.1	2,012.1	2,012.2
Titan III	932.2	745.5	745.5	1,130.5
F-111 A/C/D/E	4,686.6	5,505.5	2,941.9	7,401.3
FB-111A	1,781.5	1,781.5	655.7	1,218.5
SRAM (note d)	-	261.1	-	1,470.1
F-4E (note d)	-	-	-	2,630.8
RF-4C (note d)	-	-	-	1,571.0

[a]Cost data presented in this schedule recognizes DOD's and services' adjustments through January 9, 1970.

[b]The cost estimates are from the SAR prepared by the Army Materiel Command since the Department of the Army had not approved the June 30, 1969, Dragon SAR as of January 16, 1970.

[c]While this is the estimate appearing on the June 30, 1969, SAR it should be noted that, due to litigation, the Army's current liability is unknown.

[d]Systems in engineering and/or operational systems development and one or more of the program cost elements were omitted on the June 30, 1969, SAR.

[e]The TOW did not go through contract definition.

[f]The DOD considers this as an annex to the Sheridan vehicle and not a weapon system itself.

[g]Army officials advised us that, while the SAM-D has gone through contract definition, contract award has been limited to advance development.

SUMMARY OF MAJOR ACQUISITIONS

OF

THE DEPARTMENT OF DEFENSE

AS OF JUNE 30, 1969

Service	Estimated cost through completion			
	RDT&E	PROC	MCA	Total
	(millions)			
Army	$ 4,269.2	$ 18,203.7	$ 508.7	$ 22,981.6
Navy	7,627.5	56,791.7	62.2	64,481.4
Air Force	11,924.6	41,125.3	674.1	53,724.0
Total	$23,821.3	$116,120.7	$1,245.0	$141,187.0

Note: RDT&E--Research, development, test, and evaluation appropriations

PROC--Procurement appropriations

MCA--Military construction appropriations

APPENDIX IV

Funds programmed through June 30, 1969			
RDT&E	PROC	MCA	Total
(millions)			
$ 1,782.2	$ 7,435.9	$240.1	$ 9,458.2
4,337.8	20,884.8	103.1	25,325.7
6,735.4	13,037.2	80.4	19,853.0
$12,855.4	$41,357.9	$423.6	$54,636.9

REPORT TO THE CONGRESS

Evaluation Needed Of Cost-Effectiveness Of Four More Deep Submergence Rescue Vehicles Before Purchase By The Navy B-167325

BY THE COMPTROLLER GENERAL OF THE UNITED STATES

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

B-167325

To the President of the Senate and the
Speaker of the House of Representatives

This is our report on the evaluation needed of the cost-effectiveness of four more deep submergence rescue vehicles before purchase by the Navy. Our review was made pursuant to the Budget and Accounting Act of 1921 (31 U.S.C. 53), and the Accounting and Auditing Act of 1950 (31 U.S.C. 67).

Copies of this report are being sent to the Director, Bureau of the Budget; the Secretary of Defense; and the Secretary of the Navy.

Sincerely yours,

Elmer B. Staats

Comptroller General
of the United States

Contents

ABBREVIATIONS

ASR	Auxiliary submarine rescue ship
CNO	Chief of Naval Operations
DSRV	Deep submergence rescue vehicle
DSSRG	Deep Submergence Systems Review Group
GAO	General Accounting Office

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

EVALUATION NEEDED OF COST-EFFECTIVENESS OF FOUR MORE DEEP SUBMERGENCE RESCUE VEHICLES BEFORE PURCHASE BY THE NAVY B-167325

D I G E S T

WHY THE REVIEW WAS MADE

The General Accounting Office (GAO) is reviewing the Navy's management of its Deep Submergence Rescue Vehicle (DSRV) program which has had significant cost overruns and delays in development. Two DSRVs have been purchased by the Navy. This report covers the cost of, and the estimated effectiveness to be derived from,four additional DSRVs the Navy intends to buy. Other aspects of the program are still under review.

The DSRV is a 35-ton submersible designed for rescue of personnel from a disabled submarine. When needed, the DSRV would be transported by aircraft to a seaport near the disaster and carried to the site by a supporting ship or submarine. The DSRV would then shuttle between the disabled submarine and the supporting craft, rescuing a maximum of 24 survivors each trip.

FINDINGS AND CONCLUSIONS

The estimated cost of this rescue system has grown from $36.5 million for 12 DSRVs to $463 million for six DSRVs.

In February 1964 the Navy estimated that a rescue system including 12 DSRVs could be developed in 4 years. The estimated cost for development and 1 year of operation was $36.5 million. Further, introduction of the DSRV system was to result in a savings of $37.2 million by permitting a phaseout of an existing rescue system.

The Navy estimated in 1969 that obtaining a rescue system of six DSRVs would take a total of 10 years (1964 to 1974) and would cost about $463 million. Of this cost, about $125 million has already been allocated, $31 million has been requested for fiscal year 1970, and $307 million will be needed during fiscal years 1971 to 1974. Moreover, the existing rescue system will not be phased out; and, consequently, the anticipated savings will not be realized.

Navy officials estimate that about $200 million of the $307 million applies to the four additional DSRVs. Annual operating cost, after fiscal year 1974, for the four is estimated at over $17 million.

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GAO findings further indicate that submarine disasters where rescue is possible are rare.

Since such disasters are infrequent--there have been only two since 1928--and since two DSRVs apparently would provide sufficient rescue capability for any one disaster, the four additional DSRVs would only provide backup capability. In most cases, this backup probably could be provided by other systems currently in use or being developed by the Navy. (See p. 17.)

RECOMMENDATIONS OR SUGGESTIONS

GAO proposed that the Secretary of Defense evaluate the cost of purchasing and operating the four additional DSRVs versus their estimated usefulness. GAO also suggested that a prompt decision would be valuable since a determination that the DSRVs were not needed would halt further expenditures.

AGENCY ACTIONS AND UNRESOLVED ISSUES

The Navy replied that the Chief of Naval Operations had directed on April 29, 1969, that a study of the needed number of DSRVs begin on a priority basis. The Navy also stated that construction of the four additional DSRVs would not be undertaken until and unless their usefulness had been shown to justify their cost.

The Navy began its study on December 15, 1969--almost 8 months after it was directed. Because of the untimeliness of the Navy's action, GAO recommends that the Secretary of Defense take steps to ensure that the Navy conducts a meaningful study promptly to provide a suitable comparison of the additional DSRVs' probable usefulness to their cost.

MATTERS FOR CONSIDERATION BY THE CONGRESS

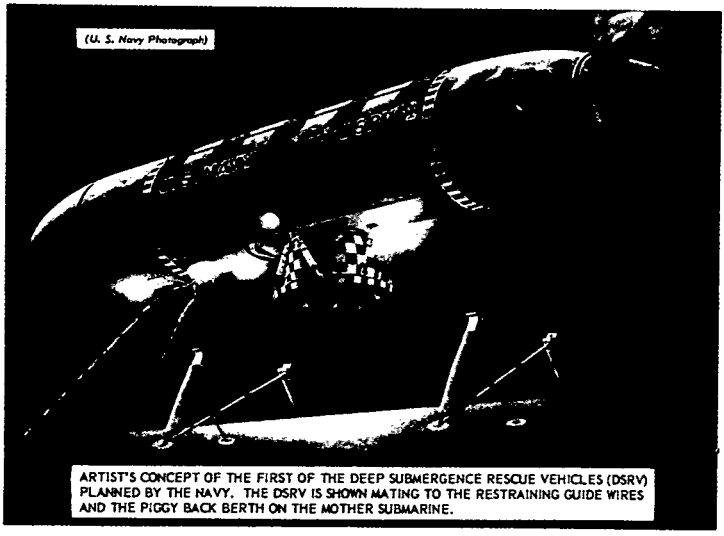
This report is being submitted to the Congress because of its expressed interest in the procurement of major systems and the reduction of unwarranted defense expenditures. The Navy currently plans to submit its requirement for additional DSRVs in its budget request for fiscal year 1971.

CHAPTER 1

INTRODUCTION

The General Accounting Office is reviewing selected aspects of the Department of the Navy's management of the development of the Deep Submergence Rescue Vehicle (DSRV). We undertook this review after a survey, which we made, indicated that the development of the DSRV was experiencing significant cost overruns and schedule slippages.

The DSRV is intended to be a small submersible vehicle designed to rescue personnel from a disabled submarine. It is expected to weigh about 35 tons and to be approximately 50-feet long. In the event of a disaster where rescue is possible, the DSRV would be transported by aircraft to the port nearest the disaster. From there it would be carried to the site by either an auxiliary submarine rescue ship (ASR) or a specially configured submarine, either of which could act as the supporting ship. The DSRV would then shuttle between the bottomed submarine and the supporting ship, carrying a maximum of 24 rescuees on each trip.



ARTIST'S CONCEPT OF THE FIRST OF THE DEEP SUBMERGENCE RESCUE VEHICLES (DSRV) PLANNED BY THE NAVY. THE DSRV IS SHOWN MATING TO THE RESTRAINING GUIDE WIRES AND THE PIGGY BACK BERTH ON THE MOTHER SUBMARINE.

It was estimated by the Chief of Naval Operations (CNO) in October 1964 that six DSRVs would be needed. Contracts have been negotiated with the Lockheed Aircraft Corporation for construction of two DSRVs. The Lockheed Missiles and Space Company, Sunnyvale, California--a division of the Lockheed Aircraft Corporation--is currently constructing these two vehicles, and deliveries are scheduled for the last quarter of fiscal year 1970 and the first quarter of fiscal year 1971. The four additional DSRVs were, as of May 1969, planned for procurement beginning in fiscal year 1971. Navy-estimated costs for the first two DSRV systems to be deployed and for the four additional systems--including vehicles, repair parts, training, tests, systems engineering, support equipment, and alterations to supporting craft--are given on page 28 of this report.

As part of our review of the management of the DSRV development, we examined the cost-effectiveness of the planned procurement and operation of the four additional DSRVs. The scope of this segment of our review is described on page 19 of this report. The matters discussed in this report pertain only to the cost-effectiveness of the procurement and operation of additional DSRVs. Other matters pertaining to the management of the development of the DSRV are still under review.

The principal officials of the Department of Defense and the Department of the Navy responsible for administration of activities discussed in this report are set forth in appendix II.

CIRCUMSTANCES LEADING TO DEVELOPMENT OF DSRV

The development of the DSRV may be traced to the U.S.S. "Thresher" disaster of April 10, 1963. The submarine, with 129 men on board, went down in 8,400 feet of water which was well beyond her collapse depth. Consequently, there was no possibility of survivors. Two weeks later the Secretary of the Navy established the Deep Submergence Systems Review Group (DSSRG). One of the responsibilities assigned to DSSRG was to "Review the Navy's plans for the development and procurement of components and systems related to location, identification, rescue from and recovery of deep

submerged large objects from the ocean floor." The DSSRG effort was largely of the in-house type utilizing then-existing experience and knowledge on submersibles for combat and oceanographic purposes.

On February 22, 1964, DSSRG submitted its report to the Secretary of the Navy and recommended, among other things, the development, construction, and operation of DSRVs capable of personnel rescue down to collapse depths of current submarines; independent of weather, surface, or ice conditions; and capable of quickly responding to emergencies at any location in the world. DSSRG's report included a study of the estimated cost and effectiveness of the use of various numbers of DSRVs. In making this study, DSSRG used the percentage of total rescue sites that could be reached in a specific period of time as the quantitative measure of effectiveness. As a result of this study, DSSRG recommended a 12-DSRV force level.

On October 8, 1964, CNO adopted the DSSRG's recommendation for development of a DSRV and issued a Specific Operational Requirement which authorized this development but established a production estimate of six DSRVs rather than the 12 DSRVs recommended by DSSRG. Navy records indicate that the CNO believed that the difference in effectiveness between six and 12 DSRVs did not justify the additional cost. The present plan for deployment of the six DSRVs is to establish a rescue unit at three different locations within the contiguous United States. Each rescue unit would include two DSRVs. This would permit one DSRV in each unit to be on alert while the other DSRV was being used for training or was undergoing maintenance.

The Deep Submergence Systems Project Office was established by the Chief of Naval Material on February 9, 1966.[1] The Deep Submergence System Project Office has been assigned responsibility for the development, acquisition, operation, and support of the DSRVs.

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[1]During the period from its inception in June 1964 through February 1966, the Deep Submergence Systems Project was part of the Navy's Special Project Office.

EXISTING MEANS OF
EFFECTIVE RESCUE

The Navy currently uses two methods by which personnel on a disabled submarine can be rescued. One of these, the McCann rescue chamber, was developed between 1928 and 1932 and will continue to be used after DSRVs are available. At the present time, 10 ASRs are in operation and each carries a McCann rescue chamber. A McCann rescue chamber operates along a cable connecting the ASR to the escape hatch of the distressed submarine and can transfer six to nine men from the distressed submarine to the ASR on each trip. The McCann system is designed to operate at depths down to 850 feet.

The other method for saving personnel from a bottomed submarine is "escape." Under this method, personnel of a disabled submarine exit without outside assistance. The existing escape system is limited as to the depth at which it is effective and does not provide for any on-the-surface protection. The Navy is currently developing an improved escape system which is expected to allow individuals to escape from submarines at greater depths and also to provide some on-the-surface protection.

CHAPTER 2

NEED TO EVALUATE THE COST-EFFECTIVENESS OF ADDITIONAL DSRVS

We have found that the Navy has purchased two DSRVs and is contemplating asking for funds to buy and operate four additional DSRVs. The data we obtained in our review indicated that the increased effectiveness obtainable through the purchase and use of these additional DSRVs would be small in relation to the cost of purchasing and operating them.

The increased effectiveness obtainable is indicated to be small because submarine disasters of the type from which rescue is possible are rare--there have been only two since 1928. Since such disasters are infrequent and two DSRVs would apparently provide sufficient rescue capability for any given disaster, the four additional DSRVs would only provide backup capability. In most cases, this backup capability could probably be provided by other systems that are currently in use or are being developed by the Navy. As to the cost of these vehicles, Navy officials estimate that about $200 million of the funds, which would be required for the DSRV system in fiscal years 1971 through 1974, relates to the four additional DSRVs.

SUBSTANTIAL INCREASE IN COST OF DSRVs

DSSRG developed cost estimates in its February 1964 study report, which were based on a force level of 12 DSRVs. Although the Navy subsequently proceeded on the basis of a six-vehicle force, the determination to proceed with the development of the DSRV was based on DSSRG cost estimates. DSSRG estimated the cost of a 12-DSRV force level to be $36.5 million for the first 5 years. This included the research and development cost, the investment cost for the 12 DSRVs, the support submarine modification costs, and operating cost. According to DSSRG's estimates, full operational capability would be obtained at the end of the 4th year.

Further, DSSRG envisioned that a cost reduction would be realized when the DSRV system became operational. In this respect, DSSRG stated that the cost of the ASR-McCann rescue system (see p. 6) would be $63.3 million for the 5-year period after development of the DSRV was initiated. DSSRG, however, envisioned the phasing out of the ASR-McCann rescue system in 2-1/2 years when the initial DSRV would become operational, and thus $37.2 million of the $63.3 million could be saved.

DSSRG concluded that, by phasing out the existing system (at a saving of $37.2 million) and obtaining the 12-DSRV force level (at a cost of $36.5 million), a net saving of $.7 million would be realized. DSSRG estimated a saving of greater magnitude beyond the initial 5-year period. DSSRG's cost analysis indicated that annual operating costs for the proposed rescue system, including 12 DSRVs, would be $2.1 million as compared to an annual cost of $7.5 million for operating the ASRs.

The costs for the DSRV system, however, have grown far beyond DSSRG's estimates. The following comparison demonstrates some of the cost increases that are being experienced.

	Cost estimates of DSSRG	As of 1969	Increase	
			Amount	Percent
	(millions)			
Production vehicles (each)	$1.4	$28.9	$27.5	1,964
Average annual operating cost per vehicle	.14	4.3	4.16	2,971

The Navy's most recent cost estimate for obtaining a fully operational DSRV rescue system of six DSRVs is about $463 million. Of this cost, about $125 million has already been allocated, $31 million has been requested for fiscal year 1970, and $307 million would be needed during fiscal years 1971 to 1974. (See p. 28.) Navy officials estimate that about $200 million of the $307 million relates to four of the six DSRVs which are contemplated in Navy plans but

for which funds have not been appropriated by the Congress. Annual operating costs after fiscal year 1974 for the four additional vehicles would be over $17 million.

In addition, the savings which were to result from the phasing out of the ASR-McCann rescue system when the DSRV system would become operational will not be realized. According to current plans, the ASR-McCann rescue system will continue to be used and the DSRV will be designed to operate from ASRs as well as support submarines.

SLIGHT PROBABILITY OF SUBMARINE DISASTERS IN WHICH RESCUE IS POSSIBLE

DSSRG, in studying the need for a new rescue system, reviewed past submarine disasters and found that there had been long time intervals between the occurrence of U.S. submarine disasters. In the years of peacetime operations since 1928, when the development of the McCann rescue chamber was initiated, there has been only one U.S. submarine disaster from which rescue was possible. On May 23, 1939, the U.S.S. "Squalus" sank in 240 feet of water. A McCann rescue chamber tended by a surface ship made four trips to the "Squalus" and rescued the 33 survivors.

In addition to this peacetime disaster, there has been one wartime submarine disaster during this period from which rescue might have been possible. On January 25, 1942, the USS "S-26" collided with its escort and sank in 300 feet of water in the vicinity of the Panama Canal Zone. By the time the ASR, which was finishing overhaul, arrived at the disaster scene there were no survivors.

In respect to wartime disasters, Navy officials stated that it was unrealistic to attempt to predict the usefulness of rescue systems under wartime conditions because of the additional factors which would hamper and/or preclude rescue. Wartime conditions, similar to those experienced during World War II, would presumably restrict the ability to provide support aircraft and ships, especially combatant submarines, to support a rescue operation. Moreover, the location of enemy forces and territory would limit the area in which rescue might be attempted. For these and other

reasons, Navy officials discount the possibility of using the DSRVs for rescue under wartime conditions.

Although other U.S. submarine disasters have occurred during this time, no rescue of personnel from these disasters was possible. The ability to effect rescue from submarines is limited by the depth at which the external hull and the internal bulkheads collapse. Rescue of personnel from modern combatant submarines is possible in only that small percentage of the ocean area in which the depth of the ocean is less than hull-collapse depth. For example, the "Thresher" descended well beyond her collapse depth, precluding any chance of rescuing survivors.

In addition to the external-hull-collapse depth, the holding strength of internal bulkheads must be considered. In the event the external hull is punctured, allowing flooding, the internal bulkheads of all post-World War II submarines will collapse at relatively shallow depths. For rescue to be possible below the collapse depth of the internal bulkhead the submarine would have to be disabled with the external hull intact. Navy documents state that the actual occurrence of such a disaster is not probable.

The Director, Submarine Warfare Division, in a memorandum on April 19, 1968, stated that, "It is not necessary to design a rescue system for any depth greater than the rupture depth of the strongest internal bulkhead of a submarine." Furthermore, the Navy Deep Submergence Ocean Engineering Planning Group, in a June 1968 report to the Deputy CNO, concluded that successful rescue of submarine crews is limited to the collapse depth of the internal bulkheads.

For the above-discussed limitations on disasters to assume importance, information on the likelihood of disasters occurring at various depths is necessary. The following table developed from Navy documents shows that about 94 percent of the time submarines will be operating in water deep enough to make rescue either impossible or improbable if a disaster occurs.

Ocean depth	Percent of ocean surface areas in which these depths occur	Percent of submarine operating time in these areas	Likelihood of rescue
To collapse depth of internal bulkhead	5	6	Possible
Between collapse depths of internal bulkhead and external hull	5	10	Improbable
Beyond collapse depth of external hull	90	84	Impossible

It should be noted, however, that DSSRG has concluded that the probability of submarine disasters where rescue is possible is greater than that indicated by the percentage of operating time because of the types of operations which are conducted in shallow waters and the greater danger of collision with surface ships near ports.

The impact of the submarine safety program must also be considered in attempting to predict the likelihood and frequency of future submarine disasters. This program was initiated after the loss of the U.S.S. "Thresher" to ensure that submarines would be as structurally and mechanically sound as feasible without detracting from their ability to perform their missions satisfactorily. The Navy estimates that over $750 million will be expended on this program. The Navy believes that this program should decrease the probability of submarine disasters.

MINIMAL INCREASE IN EFFECTIVENESS BY DEPLOYING MORE THAN TWO DSRVs

A more comprehensive study of effectiveness was made under a Navy contract by the Lockheed Missiles and Space Company.[1] This study--completed in December 1968--considered the effectiveness of deploying various numbers of DSRVs as a rescue system by themselves and in conjunction with the McCann rescue system. The study was accomplished by postulating 10 rescuable disasters. Each rescue system's environmental and depth limitations, reliability, and response time were considered in determining the overall effectiveness in achieving rescue for each of the 10 disasters. The following results were obtained.

DSRV force level for rescue	At rescue site	Effectiveness (percent)
2 DSRVs	1 DSRV	78
2 DSRVs	1 DSRV and 1 McCann	86
4 DSRVs	2 DSRVs	89
4 DSRVs	2 DSRVs and 1 McCann	90
6 DSRVs	2 DSRVs	89
6 DSRVs	2 DSRVs and 1 McCann	90

In making this study, Lockheed has recognized that much of the input data to the study either may have been the best estimate within the study's schedule and budget or may have been based upon obsolete data. In addition, the study results could vary considerably if the locations of the 10 postulated disasters were changed or if certain other conditions of the disasters were changed.

Although we recognize that the effectiveness percentages are only estimates and are not necessarily conclusive, we believe that they tend to show the relative differences in effectiveness of deploying various force levels. For the most part, the increased effectiveness provided by

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[1]As previously stated, the Lockheed Missiles and Space Company is also the producer of the two DSRVs under contract with the parent corporation.

having more than a two-DSRV rescue force level is attributable to the possibility of having a backup at the disaster site. Thus a four-DSRV level would permit two DSRVs to be at a disaster. When two DSRVs are at the disaster, one serving as a backup to the other, the probability of successfully completing the mission would increase, with a resultant increase in effectiveness. (See remarks on p. 17.)

With the McCann rescue system to serve, in the majority of cases, as a backup, the difference in effectiveness between a two-DSRV level and a level of more than two DSRVs is small. With the addition of the 850-foot depth escape system, which the Navy is developing for incorporation into its submarines, the difference in effectiveness would be even less.

CAPABILITIES OF THE DSRV AND EXISTING SYSTEMS

DSSRG also gave consideration in its study to the additional or increased capabilities that could be achieved if the new rescue system consisting of DSRVs was developed. DSSRG made a comparison of the existing system of rescue (ASR-McCann rescue system) and its proposed DSRV system, as shown in the following table.

Comparison of ASR and DSRV Rescue Systems

	ASR with McCann rescue chamber	DSRV system
Maximum depth rescue capability	850 ft.	To crush depth (note a) of existing combatant submarines
Sea state (note b) wind and current	Speed of ASR significantly reduced in weather. Time enroute to accident approximately doubles in sea state 4	Unaffected by sea state Unaffected by wind Operable in 5 knot current
	Mooring--difficult in sea state 3, more difficult in sea state 4, impossible in sea state 6	
	McCann chamber unmanageable in sea state greater than 5 or current greater than 2 knots	
Polar ice operations	ASR inoperable	Under-ice operations are feasible

[a]The exact depth is omitted due to security classification.

[b]Sea state is a numerical description of ocean surface roughness. Sea state 3 is considered moderate, 4 is rough, 5 is very rough, and 6 is high.

The DSRV as currently designed is intended to have the capabilities envisioned by DSSRG. However, as previously discussed, the increase of maximum depth rescue capability is not as significant as it would first appear because the collapse depths of external hulls and internal bulkheads make it improbable that rescues could be made below the depth attainable by the ASR-McCann system. (See table on p. 11.)

In regard to sea state, Lockheed's recent study showed that in those areas where disasters involving possible rescue are most likely to occur, sea state 4 is exceeded from only 1 to 8 percent of the time. Consequently, for about 1 to 8 percent of the time the DSRV system, because of the sea state, would have capability beyond that of the ASR-McCann rescue system. The improved escape system, which the Navy is developing, however, would not be affected by sea state as much as the ASR-McCann rescue system would be.

The DSRV system is intended to be capable of operating under ice. Because we found no documentation on the probability of a submarine disaster under ice, we could not evaluate the significance of these capabilities.

CHAPTER 3

AGENCY COMMENTS AND OUR EVALUATION

We brought our findings to the attention of the Secretary of Defense on May 23, 1969, and proposed that a determination be made of the cost-effectiveness of purchasing and operating the four additional vehicles.

In a letter dated August 19, 1969, the Assistant Secretary of the Navy (Financial Management)transmitted the Navy's reply to our findings on behalf of the Secretary of Defense. In its reply the Navy stated that "construction of additional DSRV's will not be undertaken until and unless their usefulness has been shown to justify their cost." The letter is included as appendix I. Our views on other matters cited in the Navy's reply follow.

FORCE LEVEL STUDY DIRECTED BY CNO

In its reply the Navy also stated that "On 29 April 1969 the chief of Naval Operations directed that a DSRV force level study begin on a priority basis." This directive was in the form of a letter from CNO to the Oceanographer of the Navy.

After receiving the Navy's reply of August 19, 1969, we visited the Office of the Oceanographer of the Navy to ascertain, by discussion with appropriate personnel, whether the objectives of the CNO-directed study would coincide with the objectives we had contemplated when we proposed that a cost-effectiveness study be made, that is, that the study be a suitable evaluation of whether the benefits to be obtained by purchase of the four additional DSRVs would provide a sufficient improvement in submarine rescue capability and other missions to warrant the substantial costs that would be required to buy and operate these vehicles.

On the basis of our discussion and our examination of pertinent documentation, it appeared to us that the study the Navy planned to make had been requested by CNO to provide backup material necessary to support the Navy's impending budget requests for funds to purchase and operate four

additional DSRVs. We were unable to determine from our discussion and examination of documents whether the objectives of the study would coincide with the objectives we had contemplated in proposing that a cost-effectiveness study be made.

Moreover, we found that the Navy had not issued its study order until December 15, 1969--almost 8 months after the CNO directed that an analysis be made--and that the study would not be made without such an order. The study is currently scheduled for completion in May 1970.

NATIONAL MORES REGARDING SAFETY OF PERSONNEL

In its reply the Navy stated that in considering the cost-effectiveness of additional DSRVs:

> "*** we must bear in mind that our national mores have traditionally placed a high value on human life, and we have weighed heavily on the effectiveness side of cost-effectiveness analyses of programs intended to save human life."

We agree that there is a need to stress the effectiveness of programs to save human life, and it is not our intention to minimize the importance of this aspect. However, in view of the infrequent instances in which the DSRV could be used for such a purpose and in view of the fact that two DSRVs are being produced that would provide inherent backup capability, we believe that reevaluation as to the need for four additional DSRVs is warranted. (See p. 17.)

UTILIZATION OF DSRVs FOR SECONDARY MISSIONS

The Navy stated that the DSRVs could not be evaluated as single-mission forces and that their total utilization must be considered in a cost-effectiveness analysis.

We agree that available equipment should be utilized to the maximum extent possible, including performance of

secondary missions, where necessary. We believe, however, that major consideration in a cost-effectiveness analysis should be given to the primary mission for which the equipment is to be acquired and that its availability to perform secondary missions, if and when necessary, is of lesser importance.

ESCALATION OF COSTS

In its reply the Navy expressed concern over the escalation of costs associated with the development of DSRVs. The Navy attributed the cost growth primarily to underestimating the extent of research and development required and also to high costs associated with small-quantity procurements. In addition, inflationary factors were cited.

We agree that these factors have contributed to the cost escalation, but we believe that there were other factors involving the management of the development of the DSRVs which also contributed to the escalation. Regardless of the reasons for the cost increase, however, we believe that there is a need to reconsider the usefulness of the additional DSRVs on the basis of the current estimate of cost, as distinguished from the original cost-effectiveness study which was based on the estimate of $36.5 million.

OTHER CONSIDERATIONS

The Navy's premise is that a force level of two DSRVs would permit only one vehicle to be at a disaster site with the other DSRV available for training and any maintenance required. As such, existing ASR-McCann and escape systems of rescue would constitute the back-up for a two-DSRV force level. However, in consideration of the infrequent occurrence of submarine disasters and the air transportability of the DSRVs, we believe a two DSRV force level constitutes in itself an inherent back-up, inasmuch as training and maintenance can be deferred in an emergency thereby making available both DSRVs at a disaster site.

41-698 O - 70 - pt. 1 - 10

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

As previously indicated, it appears that the study, which the Navy stated that it would make, was directed to provide data to support the Navy's budget request for funds to purchase and operate four additional DSRVs. From the information provided to us in the Assistant Secretary's letter of August 19, 1969, and our subsequent discussion with the personnel who have been designated to make this study, we cannot tell whether the objectives for the directed study will coincide with the objectives we contemplated when we proposed that a cost-effectiveness study be made, that is, that the study be a suitable evaluation of whether the benefits to be obtained by purchase of the four additional DSRVs would provide a sufficient improvement in submarine rescue capability and other missions to warrant the substantial costs that would be required to buy and operate these vehicles.

Also, as previously mentioned, the Navy had not begun its study until December 15, 1969--almost 8 months after the CNO had directed it. Although the Navy does not plan to request additional vehicles until fiscal year 1971, we believe that a prompt decision on the need for additional vehicles could be valuable. Should the vehicles not be required, an early determination could preclude further expenditure of resources in support of, and planning for, the additional vehicles.

RECOMMENDATIONS

We recommend that the Secretary of Defense take such steps as are necessary to ensure that the Navy will conduct a meaningful study to provide a suitable comparison of the probable usefulness of the four additional DSRVs in relation to their cost. We recommend also that the Secretary direct the Navy to make this study on a timely basis. Timely completion of the study will preclude further expenditures should the study indicate that the procurement of additional DSRVs is not warranted.

CHAPTER 5

SCOPE OF REVIEW

This segment of our review was performed at the Deep Submergence Systems Project Office, Chevy Chase, Maryland. In our review we examined records, reports, and other documentation relating to (1) the determination of the requirements for DSRVs, (2) the past and estimated future cost of the rescue program, (3) the capabilities of existing and planned rescue systems, and (4) the probability of submarine disasters where rescue is possible. In addition, we had numerous interviews with Project Office officials to supplement the documentary information.

APPENDIXES

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20350

Ser: 04867

19 AUG 1969

Dear Mr. Bailey:

The Secretary of Defense has asked me to reply to the GAO letter report of 23 May 1969 on planned procurement and operation of the Deep Submergence Rescue Vehicle.

I am enclosing the Navy reply to the report.

Sincerely,

Charles A. Bowsher

CHARLES A. BOWSHER
ASSISTANT [illegible] OF THE NAVY
(FINANCIAL MANAGEMENT)

Mr. Charles M. Bailey
Director, Defense Division
U. S. General Accounting Office
Washington, D. C. 20548

Enclosure
(1) Navy Reply to GAO Letter Report of 23 May 1969 on Planned Procurement and Operation of the Deep Submergence Rescue Vehicle (OSD Case #2950)

APPENDIX I
Page 2

Navy Reply

to

GAO Letter Report of 23 May 1969

on

Planned Procurement and Operation of Deep

Submergence Rescue Vehicle

(OSD Case #2950)

I. GAO Findings and Recommendation

The General Accounting Office is currently reviewing the Navy's management of the development of the DSRV (Deep Submergence Rescue Vehicle). As part of this review, GAO examined the planned procurement and operation of future DSRV's and found that current estimates show a 5-year life cycle cost of about $480 million for 6 DSRV's as compared with the original February 1964 estimate of $36.5 million for a force level of twice this size. The GAO Report indicates that at the present time, two DSRV's are nearing completion for test and probable use and that four additional DSRV's are currently planned for procurement beginning in FY 1971. GAO concludes that the four additional vehicles under consideration will, according to latest estimates, cost about $93 million to procure and about $17 million a year to operate. In view of (1) the very large cost increases, (2) the fact that savings originally expected from elimination of the existing ASR-McCann rescue system will not be made, and (3) evidence that a disaster would be rare in which a DSRV can be used, GAO recommends that a determination of the cost-effectiveness of the additional vehicles be initiated.

II. Summary of the Navy Position

On 29 April 1969 the Chief of Naval Operations directed that a DSRV force level study begin on a priority basis. It is planned that this study will provide a detailed quantitative analysis of all components related to system effectiveness, including trade offs and cost analysis. In addition to indicating desirable DSRV force levels in light of their missions and costs, it is intended that this study address other questions raised by the GAO report with respect to the continuation and usefulness of the McCann Rescue Chamber[1/] the proba-

GAO note: Our letter report did not question the continuation and usefulness of the McCann Rescue Chamber.

bility of rescuable submarine disasters, the collapse depth of external hulls and internal bulkheads, and related issues. GAO will be advised of the decision reached as a result of the study.

In this context we must bear in mind that our national mores have traditionally placed a high value on human life, and have weighed heavily on the effectiveness side of cost-effectiveness analyses of programs intended to save human life. Furthermore submarine rescue systems, except for escape systems, cannot be evaluated as single mission forces. The total utilization of the system must be considered in a cost-effectiveness analysis. The ASR's are a prime example. In addition to submarine rescue, their tasks include salvage, towing, rendering target services, supporting fleet exercises, recovering weapons and maintaining the Navy's primary deep sea diving capability.

Until the force level study is in hand, the Navy is continuing construction of DSRV-1 and DSRV-2, ASR-21 and ASR-22, and the two new submarines under construction which are receiving the DSRV "Mother Submarine" modifications. However, construction of additional DSRV's will not be undertaken until and unless their usefulness has been shown to justify their cost. Presently there is no provision in the Five Year Defense Program for additional DSRV's.

By way of background, the Deep Submergence Systems Review Group (DSSRG) Report recommended as a long term rescue improvement, that the Navy develop, construct, and operate a fleet of 12 small, submersible rescue vehicles. The Report, which was conceptual in nature, estimated that such a program would cost $36.5M over a five-year period. It is emphasized that the DSSRG Report, as a conceptual study, did not constitute the basis for the approved program. However, when such a program was subjected to engineering and design analyses, a more realistic cost of a seven-year program was estimated to be $119M, (in reality $139 million when taking into account the elimination of "shared research" caused by the deletion of the search vehicle in the final phase of the approval of the PCP). This program, which was proposed as an entire Rescue System, including improved escape development, was approved by Deputy Secretary of Defense Vance on 7 October 1965. At the time of approval, this PCP was structured on the basis of a concurrent deep search vessel program with extensive common research and development. The effect of the decision to defer the search vehicle was to increase the cost of the rescue program from $119M to 139M. Through the end of FY 69, the Navy will have spent $125M on the Rescue System Program. Distribution of funds is shown in Tab 1.

The construction, deployment, operation and fleet support of the full 6-DSRV Rescue System is now estimated to be $487M with the expenditure taking place over a 10-year period (FY 64-74) as shown in Tab 2. It is emphasized that funds for the execution of the full program have not been committed or budgeted.

The Navy, like GAO, is concerned over the escalation in the actual cost of the DSRV system from that originally estimated. The growth in cost is primarily the result of under-estimating the extent of Research and Development that would be required to obtain deep ocean equipments capable of providing the reliability required of a life saving system. Other factors which impact significantly upon the total program cost growth are the high costs of procuring very small quantities of highly specialized equipments and, to a lesser degree, inflationary effects. Tab 3 provides examples of estimated costs compared with those actually experienced.

III. Security Classification and Distribution

GAO is authorized, in accordance with the policies and procedures of DOD Directive 5200.1, to distribute to Congress copies of this report. Only the paragraphs of the GAO Report as designated in Tab 4 are classified "Confidential." [1]

GAO note: An unclassified version of Tab 4 is now incorporated into this report.

The following table depicts the funding for the Rescue Program

(Dollars in Millions)

ACTUAL ALLOCATION	RDT&EN	OPN	O&MN	TOTAL
FY 1965	2.4			
FY 1966	6.5	.7		
FY 1967	15.3	3.2	11.2	
FY 1968	21.4	16.0	8.0	
FY 1969	20.8	15.9	3.7	
SUB TOTAL	66.4	35.8	22.9	125.1
CONGRESSIONAL SUBMISSION	**RDT&EN**	**OPN**	**O&MN**	
FY 1970	10.7	13.8	6.6	
SUB TOTAL	10.7	13.8	6.6	31.1
PORTION OF THE FYDP NOMINALLY ASSESSED TO THE RESCUE PROGRAM	**RDT&EN**	**OPN**	**O&MN**	
FY 1971	3.1	7.9	9.5	
FY 1972	1.9	5.6	9.4	
FY 1973	.4	4.1	9.3	
FY 1974	.3	3.8	9.3	
SUB TOTAL	5.7	21.4	37.5	64.6
TOTAL	82.8	71.0	67.0	
GRAND TOTAL				220.8

TAB 1

APPENDIX I
Page 6

A 10 year plan for a complete six vehicle (DSRV) rescue system.

A. $125 million dollars committed through FY 69 accomplishes the following:

DSRV 1 and 2 ready for test. Research and development associated with these vehicles and their equipment, repair parts, training, test and range preparation, system engineering, design and procurement of support equipment, design required for modification of submarines for both support and rescue. TOTAL $125M

B. $31 million dollars requested FY 70 accomplishes the following:

Completion of A. above and a full test program for evaluation and delivery of two vehicles. 31M

C. $331 million dollars FY 71-74 if approved would accomplish the following:

ITEM	FY71	FY72	FY73	FY74	TOTAL	
Rescue Vehicles (4) (DSRV Nos. 3 thru 6)	28.9	28.9	28.9	28.9	115.6	
Vehicle Logistics	13.6	13.1	13.7	15.5	55.9	
Test/Support Equipment	11.2	10.9	11.8	11.2	45.1	
Escape & Survival Equip.	3.5	3.6	3.3	13.6	24.0	[1]
Alts [2] Ship/Equipment	12.1	8.7	8.9	10.5	40.2	
Lab/Range/Tests	13.8	6.0	3.6	3.8	27.2	
Training	4.5	3.1	3.5	4.5	15.6	
System Engineering	2.5	1.9	1.5	1.5	7.4	
	90.1	76.2	75.2	89.5	331.0	331M

GAO note: GRAND TOTAL 487M

[1] Costs shown in the text of this report exclude this amount because this cost is not directly related to the Deep Submergence Rescue Vehicle.

[2] Abbreviation for "alterations to."

TAB 2

APPENDIX I
Page 7

Breakdown of the Material and Sub-Contractor Variance Costs - DSRV-1 [1]
($000)

	Item	Original Estimate	Actual	Variance
1.	Pressure Capsule (Sun Ship Co.) First HY 140 Structure of this size built. Welding problems and process development costs were underestimated.	$1471	$3958	$2487
2.	Fiber-glass Outer Hull (Hitco Cog) - Largest fiber-glass structure ever built. Lay-up problems encountered; underestimated scope of job.	47	273	226
3.	Manipulator (WEC) Development problems with jettisoning and vehicle interfaces.	612	938	326
4.	Winches (United Shoe Co.) Grossly underestimated costs; only one company (of many solicited) interest bid.	46	600	554
5.	Electrical Penetrators Problems developing a small, light-weight penetrator.	160	350	190
6.	Surface Support Equipment Underestimates scope of job; very few bidders.	265	851	586
7.	Other Underestimated scope of job. Very few bidders. Additional testing and re-work required.	2430	5300	2870
	TOTALS	5031	12270	7239

GAO note: As noted on page 26, these are only some examples.

TAB 3

APPENDIX II
Page 1

PRINCIPAL OFFICIALS

OF

THE DEPARTMENT OF DEFENSE

AND THE DEPARTMENT OF THE NAVY

RESPONSIBLE FOR ADMINISTRATION OF ACTIVITIES

DISCUSSED IN THIS REPORT

	Tenure of office	
	From	To
DEPARTMENT OF DEFENSE		
SECRETARY OF DEFENSE:		
Melvin R. Laird	Jan. 1969	Present
Clark M. Clifford	Mar. 1968	Jan. 1969
Robert S. McNamara	Jan. 1961	Feb. 1968
DEPUTY SECRETARY OF DEFENSE:		
David M. Packard	Jan. 1969	Present
Paul H. Nitze	July 1967	Jan. 1969
Cyrus R. Vance	Jan. 1964	June 1967
Roswell L. Gilpatric	Jan. 1961	Jan. 1964
DEPARTMENT OF THE NAVY		
SECRETARY OF THE NAVY:		
John H. Chafee	Jan. 1969	Present
Paul R. Ignatius	Sept. 1967	Jan. 1969
Charles F. Baird (acting)	Aug. 1967	Sept. 1967
Robert H. B. Baldwin (acting)	July 1967	Aug. 1967
Paul H. Nitze	Nov. 1963	June 1967
Fred Korth	Jan. 1962	Nov. 1963
CHIEF OF NAVAL OPERATIONS:		
Adm. Thomas H. Moorer	Aug. 1967	Present
Adm. David L. McDonald	Aug. 1963	July 1967

PRINCIPAL OFFICIALS

OF

THE DEPARTMENT OF DEFENSE

AND THE DEPARTMENT OF THE NAVY

RESPONSIBLE FOR ADMINISTRATION OF ACTIVITIES

DISCUSSED IN THIS REPORT (continued)

	Tenure of office	
	From	To
DEPARTMENT OF THE NAVY (continued)		
CHIEF OF NAVAL MATERIAL:		
Adm. Ignatius J. Galantin	Mar. 1965	Present
PROJECT MANAGER, DEEP SUBMERGENCE SYSTEMS PROJECT (note a):		
Capt. William M. Nicholson	Jan. 1967	Present
Dr. John P. Craven	Feb. 1966	Jan. 1967
DIRECTOR, SPECIAL PROJECTS OFFICE (note a):		
Adm. Levering Smith	Feb. 1965	Feb. 1966
Adm. Ignatius J. Galantin	Feb. 1962	Feb. 1965

[a]During the period from its inception in June 1964 through February 1966 the Deep Submergence Project was part of the Navy's Special Projects Office.

THE ACQUISITION OF WEAPONS SYSTEMS

TUESDAY, DECEMBER 30, 1969

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

The Subcommittee on Economy in Government met, pursuant to recess, at 10 a.m., in room G–308, New Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard Kaufman, economist, and Douglas C. Frechtling, economist for the minority.

OPENING STATEMENT BY THE CHAIRMAN

Chairman PROXMIRE. Mr. Rule, would you come to the witness table? I have a short statement before you appear. You are the only witness this morning.

Yesterday we heard testimony from the General Accounting Office that confirmed in almost every respect the charges which have been made about defense contracting by this committee and responsible critics, such as A. E. Fitzgerald and Richard Stubbing. We have been pointing out for months, over the active hositility of the Pentagon and particularly the Air Force, that cost overruns, delivery delays, and poor performance are the hallmarks of the weapons acquisition process. In the past, Congress had been assured that mistakes and shortcomings in weapons programs were a special phenomena. What was underlined in yesterday's testimony is that cost overruns and other program failures are at least as common as program successes. They are not the exception—if our witness will pardon the expression—they are the rule.

One of the major problems for the Congress has been the lack of information. We have found an unfortunate tendency within the Defense Department to withhold information, sometimes by classifying materials that ought not to be classified, sometimes by denials. There seems to be a temptation within the Defense Department to accuse its critics of everything from ignorance to lack of patriotism.

I believe the public will no longer accept the glib explanations that have been offered for program failures and for the waste of hundreds of millions, if not billions of dollars, and that it can see through the smokescreen of irresponsible personal attacks and other diversionary efforts intended to cover the truth.

We are in a new era of public policy and public scrutiny of Government expenditures, including military spending. It is an era of greater

inquisitiveness on the part of the public and of a much higher expectation that its hard-earned tax money will be spent wisely and will not be frittered away through Government mismanagement and on unnecessary programs.

The American taxpayer owes a debt, in my opinion, to the critics, to those who have spoken out candidly, for the critics have been vindicated. They have been proven correct, and yesterday's testimony was further proof that there are basic problems inherent in the weapons acquisition process.

This morning we will hear from one who works for the Government and who has maintained a sense of dedication to his profession and responsibility to the American people. Gordon W. Rule, Director, Procurement Control and Clearance, Navy Material Command Headquarters, was candid in his testimony before this subcommittee last June and you have already made, Mr. Rule, a valuable contribution to the understanding of the weapons acquisition process.

My understanding is that there is presently over $1 billion in claims pending against the U.S. Navy by its own contractors. Mr. Rule was recently appointed the head of a committee to review the claims pending against the Navy by shipbuilders, and today we hope to have a good discussion on the claims and other problems.

Mr. Rule, will you first give us an idea of the responsibilities you have had in the Navy in the past several years, of your present job, and of your special assignment with regard to the shipbuilding claims and you may proceed in any way you wish. I understand you do not have a formal mimeographed statement.

STATEMENT OF GORDON W. RULE, DIRECTOR, PROCUREMENT CONTROL AND CLEARANCE, NAVY MATERIAL COMMAND HEADQUARTERS

Mr. RULE. No, sir; I do not. Similarly the last time I testified I purposely did not prepare one because it would have to be edited or censored. So I have some notes.

Mr. Chairman, I have—I was a captain on active duty in the Navy. I was head of the Contract Division in the Bureau of Ships. I then went back to practicing law and returned to the Government in 1963 at which time I entered upon my new duties as chairman or rather head of the Procurement Control and Clearance Division.

That is, believe it or not, a very intriguing, it is a wonderful job, it is a responsible job. I have a great deal of authority, I have to approve every business clearance over $5 million before the Navy can make a contract for ships, aircraft, missiles, and so forth. So there is a lot of control right there in that division that I head.

I am a GS–17 which, as you know, gets paid $32,000 a year, and I take that responsibility seriously, and when I see things that I don't think are right there is only one thing to do and that is challenge them.

That, I might add, that word "challenge," is one of the things that I think we need more ability to do in the Navy. I don't know about the other services.

The civilians, if I may put it bluntly, need more opportunity to challenge the military on the business aspects, obviously not for technical aspects because while we know something about it they are the technical people, by and large. But we have to get more authority and ability to challenge the way the military wants to buy certain things.

I was given this appointment as head of this new group on claims just a couple of months ago, and that work is proceeding slowly because you don't settle claims against the Government very quickly.

Is that enough background?

Chairman PROXMIRE. That is fine.

Mr. RULE. Now, let me say good morning and Happy New Year, and this is what I started to say but you had to start before me.

Now, I hope, I really do, that 1970 brings for both of us, because I think we are both aiming at the same thing, a reduction in waste and inefficiency and better contracting practices. I hope 1970 gives us a little more of what we both want and I want to thank you for your support of the Holifield Commission. It is, as you know, being set up. I think that will go a long way toward meeting some of the long-range objectives of what we both have in mind.

Mr. Chairman, I would like to get the ground rules, if I may, squared away with you because you are the only one here, so I would like you to know that when I talk to you this morning I am talking as a partner. This is not, I don't look upon you as an adversary. I think we are trying to do the same thing. We may be trying to do it a little differently but in anything that I say I would appreciate it if you would understand that I am saying it looking upon you as a partner in this joint effort.

Chairman PROXMIRE. Well, I appreciate that very much, Mr. Rule. I certainly will.

Mr. RULE. And having now——

Chairman PROXMIRE. At the same time let me say some of the questions I may ask may seem to be adversary type questions or questions implying a degree of suspicion of skepticism, but they mean no disrespect at any time to you. I meant every word I said when I praised the contribution you have made to our understanding of the procurement process.

Mr. RULE. That is right. You may say things that I don't like and which seem adversary. That is why I want to establish this partnership relationship right now.

Chairman PROXMIRE. Very good.

Mr. RULE. And having done that let's do one other thing, let's agree to keep a sense of humor.

Chairman PROXMIRE. Fine. [Laughter.]

It reminds me, you know, when two pugilists are about to have at each other they come out in the center of the ring and the referee says "shake hands and come out fighting."

Mr. RULE. That is right, it is like on the first tee in golf, you are all friends, but the minute you tee off everybody is an S.O.B. I don't want it that way, we are all partners in these things. I think we can help each other.

Chairman PROXMIRE. All right.

Mr. RULE. I just want to make a short statement about these shipbuilding claims.

We have other claims against the Government for other hardware, missiles, and things like that, but the bulk, the great bulk, of the claims are by shipbuilders, and that is what I want to direct my comments to this morning.

To really set the stage for how seriously the Navy takes these claims, I want to read a letter dated March 8, 1969, or rather a memorandum, for Admiral Galantin, who is the Chief of Navy Material, from Admiral Moorer, the Chief of Naval Operations. The subject is, Todd Shipyard Claim:

I have studied reference (a) with concern and apprehension.

(Reference (a) was a document stating that we had settled the Todd claim for $96.5 million). Admiral Moorer says—

I have studied reference (a) with concern and apprehension. The liability of the U.S. Government for $100 million claim after over 100 years of experience in shipbuilding is a matter of gravest concern. The allegations of the contractor, which he is apparently able to sustain, that "Government actions," "late Government furnished information," "defective specifications," and "administrative failures" are the basis for his claim indicates that we must take corrective action now or, ultimately, lose our entire Navy.

2. We simply must come to grips with this problem at an early date and establish management procedures which will tag these overruns before they get out of hand. I recognize that there are many factors in this very complex business over which control is difficult to exercise; however, to do better is mandatory. This one requires surgery and not treatment. If there are to be overruns let's find it out early in the game.

3. Please consider the solution to this problem your No. 1 task.

Now that is Admiral Moorer writing to Admiral Galantin, two 4-star admirals. This is an unclassified letter, and I don't think that there is any way that you can see, or get a better feel for how the Navy, certainly Admiral Moorer and I can say to you, sir, and I can assure you that the civilian seretaries in DOD and in the Navy share that same feeling no less than does Admiral Moorer.

CONTRACT CLAIMS CONTROL AND SURVEILLANCE GROUP

And Admiral Galantin, one of the things he did as a result of that was set up this special Contract Claims Control and Surveillance Group to ride herd on these claims and dispose of them.

He made me the head of that group, and if you are interested, I can supply for the record a copy of the charter——

Chairman PROXMIRE. I wish you would.

Mr. RULE (continuing). That he gave me.

(The charter follows:)

DEPARTMENT OF THE NAVY,
HEADQUARTERS NAVAL MATERIAL COMMAND,
Washington, D.C., October 30, 1969.

From: Chief of Naval Material.
To: Distribution List.
Subject: Contract Claims Control and Surveillance Group.
Enclosure: (1) Charter for subject Group.

1. Enclosure (1) is approved for implementation this date.

I. J. GALANTIN,
Admiral, USN, Chief of Naval Material.

CHARTER FOR CONTRACT CLAIMS CONTROL AND SURVEILLANCE GROUP

1. *Purpose.*—The Contract Claims Control and Surveillance Group is established within the Headquarters, Naval Material Command, for the purpose of assuring adequate and necessary special review procedures for the processing and disposition of major contractor claims submitted by the Systems Commands. It is the purpose of this charter to create a single focal point within the Naval Material Command where current information will be maintained as to the status of major claims and from which coordinated guidance and advice will be given to the Systems Commands regarding the handling of such claims. Further it is the purpose of this charter, to the extent authorized by the Chief of Naval Material, to provide a means for direct participation by the Chairman of the Group, or the entire group, in the negotiation and settlement of such claims.

2. *Designation of Chairman.*—Effective immediately, Mr. Gordon W. Rule of my Headquarters, is designated Chairman of the Contract Claims Control and Surveillance Group established in Paragraph 1 above. This assignment takes precedence over all other assignments.

3. *Definition.*—The term "claim" for the purpose of this charter is considered to be any request for contract adjustment in the amount of $5,000,000 or more involving to a signficant extent a "constructive" change order; including those based on late or defective specifications, drawings, data, or other administrative action or inaction of the Government. The term also includes claims based on defective or late Government furnished property but excludes price adjustment under escalation provisions and redetermination provisions, actions under P.L. 85-804 and all claims involving New York Shipbuilding Corporation, for which other special arrangements for surveillance and settlement have been made.

4. *Duties of the Chairman of the Contract Claims Control and Surveillance Group.*—

a. Assemble and direct Contract Claims Control and Surveillance Group. The membership shall include technical, audit, cost analysis, and financial personnel to assure successful compliance with the declaration of purpose outlined in paragraph 1 above. The Group is initially constructed as follows:

Mr. Gordon W. Rule: Chairman.
Mr. E. C. McCubbins: Technical Representative.
To be assigned: Technical Representative.
Mr. Herbert B. Goodwin: DCAA Representative.
Mr. Benjamin Kriss: Contract Administration Representative.
Mr. Paul Peterson: Programs and Financial Management Representative.

Additional personnel will be added to the Group as recommended by the Chairman and approved by the Chief of Naval Material.

b. Convene the Group as necessary to accomplish the purposes of this charter.

c. Establish effective liaison with the Commanders and Systems Commands and their designated representatives with respect to the handling of claims under contracts.

d. Obtain, evaluate and effectively utilize—from whatever source obtainable within the Government—such data, information and facts as considered necessary to a determination of the final position for disposition or settlement of a claim(s).

e. Prescribe the form and scope of pre and post negotiation clearance on claims to be submitted by the Systems Commands.

f. Provide guidance and assistance to the Systems Commands and their delegated representatives in connection with the processing of claims.

g. Establish, in conjunction with the Systems Commands, milestones for accomplishment of actions relating to the settlement of claims and monitor progress against those milestones subject to such other internal Navy approvals as may be required.

h. Except for other prescribed approvals, determine the position for disposition or settlement of claims. If the final position determined by the Chairman is not concurred in by any member of the Group, such member or members shall write their position to accompany the Chairman's determination.

i. Report periodically, but not less frequently than once a month, the status of claims determination and other matters relating thereto, of substantial interest or concern, to the Chief of Naval Material and the Deputy Chief of Naval Material (Procurement and Production).

j. When specifically authorized by the Chief of Naval Material, undertake direct negotiations with a claimant with respect to the settlement of claims.

k. Upon the recommendation of the Chairman, Contract Claims Control and Surveillance Group, and with the approval of the Chief of Naval Material, a claim may be excluded from this charter at any stage of its processing.

l. If and when necessary to effectuate the purpose of this charter, request, via the Deputy Chief of Naval Material (Procurement and Production), the Chief of Naval Material to amend this charter.

5. *Legal Services.*—The Office of the General Counsel shall be responsible for the determination of all legal matters concerning contract claims. Mr. Albert H. Stein, Deputy General Counsel, has been designated for this purpose.

Mr. RULE. Concerning the merits of these shipbuilding claims, let me say that some have considerable merit, some have partial merit, and some have very little merit at all. Filing claims against the Navy has never been nonexistent; there have always been claims against the Navy under shipbuilding contracts, always.

When I was in the Contract Division of the Bureau of Ships we had claims primarily at that time for late delivery of Government-furnished material. Now we have claims for many other things; late delivery of Government-furnished information, defective specifications, impossibility of performance under the specifications, and things like that which we rarely had before.

It has apparently become fashionable to file these large claims. Actually, I think it is a new dimension in some; in a few of the large Washington law firms, it is a dimension they never had before.

COSTS OF PREPARING CLAIM

We have one claim that I would like to tell you about. The largest one we have is—it tells us, that it cost a million and a half dollars to prepare the claim, and the theory of this claim, I think, will be of interest to you. This particular claim is from a shipyard that was bought out by one of the large aerospace companies, just 10 years ago, in 1959. Since that time they have had nine contracts from the Navy for new construction. They have lost money on all nine of those contracts. They incidentally got most of them, almost all of them, by formal advertising where low bid takes it.

They have put in a claim, which, as I say, they tell me cost a million and a half dollars to prepare, and the amount of this claim is the difference——

Chairman PROXMIRE. Can you give us the name of the aerospace company involved?

Mr. RULE. I would prefer not to.

Chairman PROXMIRE. All right.

Mr. RULE. I will do so; I will give it to you off the record but——

Chairman PROXMIRE. All right.

Mr. RULE. But I see no reason to—as with all these claims, Senator, I could give you the names of them, and the dollar value of their claim but I don't think it would be very prudent to do it in public because it might affect one against the other or give other people ideas.

Chairman PROXMIRE. Well, you are in a critical position with regard to handling these claims now, and I will rely on your judgment. I hope wherever you feel that you can make public the identity, it would be helpful.

Mr. RULE. I have no objection at all, sir, of supplying it to you or the staff on that basis.

Chairman PROXMIRE. All right.

Mr. RULE. But the amount of this claim is the exact difference between the face value of the contracts—I forgot to say one thing. Of these nine contracts that they have had since the yard has been owned by this aerospace company, six of those contracts are completed and three are still ongoing. The amount of the claim is exactly the difference between the face value of the contracts they bid on and got, and how much they lost on each one of the six, and how much it is going to cost to complete the other three. Just a nice round figure, it is exactly every dollar they have lost and that is the theory of their claim.

SHIPBUILDER INEFFICIENCY

I asked the man who gave me this information from the company if losing money on every contract they ever had with the Navy didn't tell him something. Didn't it perhaps tell him that they might be a little inefficient, or that maybe they shouldn't be in the shipbuilding business at all, and he said, "Yes, it tells us that." And I said "Well, how do you reflect that sort of thing in the amount of this claim," and he said, "Oh, that is for negotiation."

So here we have a million and a half dollar claim prepared by one of these Washington law firms for exactly the difference between the face value and the cost to complete and they are going to leave everything to negotiation.

Now, that makes it a little difficult for the Government to settle a claim like that.

This particular theory of submitting claims by shipyards isn't confined to that one company. I see it in others. Their philosophy seems to be, the philosophy seems to be growing, that put in a big claim, scrub this contract and find every detail that you can put a claim in for and you will get it settled for 30, 40, or 50 percent or whatever you put the claim in for. That seems to be a spreading philosophy.

I can assure you it is a philosophy not shared by the Navy. We have a philosophy but it is not that one. Our philosophy is that when a shipbuilder or anyone else presents a claim to the Government the burden of proof is on them to prove every single dollar. We have to be fair and reasonable with them and pay them when they can establish reasonably that we, by our actions or inactions, have caused them to incur additional costs.

But our philosophy is that the burden of proof is on them to prove that claim—and this is going to make it difficult because some of them, I don't think, are going to be able to prove their claim, in which event we will make a contracting officer's determination and let them, if they wish, go to the Armed Services Board of Contract Appeals. If we are going to err it will be on the side of the Government and on the side of the taxpayer and we will not just pay these claims.

As I say, I am pretty sure it has become fashionable to file for such large claims in the hope we will settle on some percentage basis.

Generally we will dispose of these claims that we have now. But we won't settle them anywhere near on their face value of the billion dollars.

$200 MILLION CLAIM

Chairman PROXMIRE. Can you give us the figure in this example that you suggested where there is one of the biggest claims you have had and it is a million and a half dollars to prepare the claim. Can you give us the figures roughly of the amount involved?

Mr. RULE. Approximately $200 million.

Chairman PROXMIRE. About $200 million.

Mr. RULE. Approximately $200 million.

Chairman PROXMIRE. That is the biggest single claim you have had?

Mr. RULE. Yes, sir.

Chairman PROXMIRE. All right, go ahead.

Mr. RULE. But I thought you might be interested in the general description of that large claim because it—I don't want to characterize it as phony as a $3 bill, and I won't, but I will indicate that it is going to be rather rough to settle.

That is about all I have to say, subject to questions, of course, on claims that are before us now.

As I say we will settle those claims. Would you care to ask any questions about that?

Chairman PROXMIRE Go right ahead.

THE SEEDS OF CLAIMS

Mr. RULE. I have, what I would like to get into now, with your permission, is the area that is really more important to me than settling these claims. As I say, we will take care of these as expeditiously as we can, and certainly we won't pay out $1 more than can be shown to be merited.

But the thing that I am most concerned with are future claims. These claims that we have now arise from seeds that were sown in 1963, 1964, and 1965. It takes about 4 years for one of these claims to surface, and I am much more interested in what we are doing now. Are we sowing seeds now that are going to ripen in 1973, 1974, and 1975? That is what I am much more interested in, and from where I sit I have made mistakes, I have cleared contracts in the past when I didn't recognize the possibility of claims, but we all learn and now that we have these claims I have learned what to look for and what not to look for to a much greater extent than I ever was capable of doing before, and I want to state for the record with all the clarity and force at my command that I am not going to approve another contract, I don't care how big they are, I am not going to approve another one and I will take it all the way to the Secretary of the Navy, if I spot in there the seeds of a claim, and you can see these things.

Now, if you are exposed to them long enough, and I promise you that and, as I say that is not a meaningless promise because I have to approve these things for business aspects before the contract is made, and having had this rather sad experience I feel I am equipped now to spot these things.

Obviously in this capacity of clearing these contracts before they are awarded, I don't clear the technical aspects. It is the business aspects that I clear.

Chairman PROXMIRE. It is the what aspect?

Mr. RULE. The business aspects. It is the business aspects that lead to many claims, in my opinion.

I am optimistic that now in the Ship Systems Command they have a new team, they have Admiral Sonenshein, the No. 1 man, and Admiral Gooding, the No. 2 man. These are recent appointments. I have considerable confidence that these two gentlemen, knowing as they do in detail the mistakes that were made in the Todd case, which as I said was settled, they have chapter and verse on what went wrong there, and these are two able men and I believe, I have confidence, that they will make the required improvements, necessary improvements, on the technical side of the house, getting better specs and that sort of thing.

NEW SHIPBUILDING CONTRACT POLICIES

Already some things have been done, Mr. Chairman, some changes have been made which can only be on the good side. For example, we have realized that when we are going to make a shipbuilding contract like the LHA that was a large contract, a billion-dollar contract, and that went through what we call the CD process, the contract definition process, and the successful contractor was in competition all the way through CD. We tell them in contract definition what we want and they tell us how they will perform, how they will do what we want. We give them a general idea of the type of ship we want, and then they come out with how they will build that ship. So that the process ends up with the specification for the ship, the drawings, and the design being the contractor's. In this particular case Litton got the contract for these LHA ships.

We realized that coming out of that procedure the design, as I say, and the specs were Litton's so we drafted a clause saying, first, having Litton agree, that they were their specs and designs and, hence, they would have no claim against the Government for inability to build to those specs or drawings or design at any time.

Now, we can't do that when they are a Navy design and specs, you see. We might be able to do it if we do give a shipbuilder enough time to sit down and review our specs and our design, which we rarely do. But in the case of any ship or class of ships coming out of contract definition we have this new theory, which is a good one, whereby they admit that it is their design and they will have no claim against the Government for inability to build to that specification. So to that extent we have moved a step ahead.

We have also decided that for ships not in CD, not going through that procedure, we are going to ask shipbuilders to build to, generally to, a performance specification, not to a detailed specification, which gets us in trouble.

RELAXATION OF NO-DEVIATION POLICY

We are going to relax, we have relaxed, our no-deviation policy. That is a policy where one of the type desks—well, take the DE–1052 class with which you are familiar. They had a no-deviation policy. They wouldn't deviate from the plans or specifications. The contractors would write in and say, "I need help in this area." Under the no-deviation policy, they just say, no. This breeds claims.

We are not going to obtain ships any more by formal advertising. We are not going to obtain ships any more by firm fixed-price contracts. I shouldn't say any more but this is, I am stating, a general rule, to which there are always exceptions.

We are going to in the future require, and this is very important, from the claims point of view, we are going to require what is called a line of balance to be presented with each business clearance. A line of balance simply is a chart that shows you the dates that the Government-furnished material has to arrive at a shipbuilders yard for timely incorporation in the ship if he is going to be able to meet his ship delivery date. We have not done that in the past.

I am hopeful that we will go in the future much more to—you have heard of two-step formal advertising contracts. I hope we can go to two-step negotiated contracts where we will have contractors competing against each other, not advertised procurement, because in an advertised two-step formal advertised procurement, you don't have the opportunity that you do in a negotiation to sit down and make sure that the contractor understands everything that he is going to bid on, and then in step two let him submit his price.

We have, we are going to, and I am sure we will, have greater control of changes. We are going to try to not call out, as Admiral Adair testified before the Holifield committee, to not call out too sophisticated components which are unproduced, untested components for ships. We have made mistakes in this area. This was again an area that we made mistakes in the DE-1052 class. Those are some of the things we have done.

Now, despite my confidence in the abilities of Admiral Sonenshein and Admiral Gooding to take over the Shipbuilding Systems Command and shape it up, in my looking ahead to areas of future claims I would be a great deal less than candid if I didn't mention to you an area that bothers me considerably and I have really, Senator Proxmire, wrestled with myself as to whether I should mention this area, but I cannot look ahead without seeing this area and, therefore, I want to mention it.

In mentioning it I do so for three reasons: First, because I have very much the future of the Navy at heart, and I agree completely with what Admiral Moorer said when he says if we don't take corrective action now we will ultimately lose our entire Navy, now that is a strong statement, and when he says we need surgery not treatment, that is a strong statement, and I intend to apply it. So that is one reason.

The second reason is that I am a strong believer in lessons learned. In the past we made the same mistakes, we haven't learned our lessons and I want to see that we learn our lessons.

And, third, it is the way I am built, I guess, I prefer foresight to hindsight. Anybody can work on this pile of claims we have now, that doesn't take many brains. It does take brains to try to look ahead and see what we may be heading into, and forgive me but that is what I am trying to do and, therefore, what I am referring to specifically is the claim breeding manner in which we have contracted for some of our nuclear propelled vessels in the past.

UNREALISTIC SHIP DELIVERY DATES

From claims now in being, claims that we have before us right now, it is obvious that contracts have been made where unrealistic

ship delivery dates were set when it was known, or should have been known, that the nuclear propulsion components for the ships would not be delivered to the yard in time to enable the yard to meet their delivery date. The result: Claims, and we have them for that reason.

If these practices are permitted to continue I predict substantial additional claims that the Navy will face from the construction of the CVAN's, the DXGN's and other authorized nuclear vessels. It is very clear indeed to me that the Navy must be firm in its determination to not permit future contracts to contain unrealistic ship delivery dates as tested by the delivery dates of the nuclear component Government-furnished material that goes into these ships. I believe I can assure you, because I have this assurance myself, that topside Navy officials will be this firm.[1]

That concludes my statement, sir.

Chairman PROXMIRE. Well, thank you very much, Mr. Rule.

SHOULD-COST APPROACH

Mr. Rule, I would like to ask you first about the "should cost" method of evaluating the efficiency of a contractor's operations. Yesterday GAO gave us an interim report on the "should cost" feasibility study this committee recommended in its May 1969 report.

First, since you are one of the pioneers in the use of the "should cost" approach, I wonder if you would give us the benefit of your views on this subject and explain what the concept is, and why you believe it can be a valuable tool in military procurement?

Mr. RULE. Well, it is a very unusual procedure, up to now it has been. I don't know of any other case actually where it was done to the extent that a very capable team and myself did it at Pratt & Whitney where we had 40 people up there at Pratt & Whitney's plant in Hartford for weeks, right down in the plant checking everything, taking time and motion studies on labor and checking everything in the plant, machine utilization, efficiency of the workers. This was an effort that was brought about by Mr. McNamara being concerned with the costs of the F–111 engines. He was concerned with the cost of everything connected with the F–111, but when Pratt & Whitney originally gave an estimate for the cost of the engines it was $279,000 roughly, 270-some thousand per engine, and by the time we were sent up there to check the prices they had gone up to about $750,000, and quite properly the people in DOD wanted to know why. So they set up this team.

They told me to set up this team and they said "We don't want you to approach this on the basis of what it will cost. We know what the company said it will cost. We want you to get in there and tell us what these engines 'should cost'" and the only way we did that was to get some very able people in various spheres of activity, principally, I might say, it takes industrial engineers to do this work, but we went in there and we concluded that Pratt & Whitney was between 30 and 35 percent inefficient. And then came the question of what were we going to do about it, having determined that.

[1] An exchange of correspondence between Chairman Proxmire, Adm. H. G. Rickover, and Secretary Sanders on this matter may be found on p. 276.

Well, we had fortunately gotten Pratt & Whitney to agree to a special clause, which I will never get over their agreeing to, which gave us the right to unilaterally determine the price of the engines if we couldn't mutually agree. In other words, if they wanted $750,000 and we determined from our "should cost" study that it should be $600,000, without this clause there was nothing we could do, they could say "Thanks for telling us," and that was all, but they agreed to this clause, and we couldn't negotiate, so we made a contracting officer's determination as to what we would pay them for the engines, and within 1 week after that contracting officer's decision was made the whole case was settled. And I might add that with that experience, we have now been successful in having ASPR approve a clause, the same clause, for all letter contracts which will go into effect next month. So that the contracting officer will now have a tool he never had. Where a recalcitrant contractor who doesn't want to settle a letter contract can just drag it out forever, now the contracting officer can make a determination.

But to get back to this 30- to 35-percent inefficiency that we found, you may be interested in the fact that having found that, as I say we had to determine what to do about it, and I determined, because I had carte blanche authority and a good backup from everybody up the line, I determined that half of that inefficiency was the fault of the Navy. In other words, if the Navy had been doing its job, both here in Washington and in the Naval Plant Representative Office at Hartford, in my opinion, the inefficiency would not have been that great. In short, half the fault was ours.

Chairman PROXMIRE. You see what I am trying to get at, Mr. Rule, is that GAO gave us a very encouraging report indicating wide potential use for the "should cost" approach, but its observations on the intentions of the Department of Defense were not optimistic; that is, the intentions of the Department of Defense in using the "should cost" approach.

For example, it indicated that the Navy does not currently plan to provide a continuing "should cost" capability, nor does it plan to perform extensive reviews of the type you performed in the Pratt & Whitney case to which you have just referred.

Can you tell us whether this is your understanding of the status of the "should cost" approach in the Navy and whether the Air Force is similarly disposed to not employ this "should cost" approach?

OPPOSITION TO SHOULD-COST APPROACH IN DOD

Mr. RULE. Well, I just got through saying that I determined half the fault for the inefficiency was the Navy's. You can picture how that endeared me to certain people in the Navy. But that was the way I felt, and the people in the Navy who were responsible for this inefficiency were, of course, not in favor of a "should cost" study and there are certain people in DOD who were there then and still are in responsible positions who never liked the theory and, in fact, not only discouraged it but threw roadblocks. The Air Force never liked it. The Air Force was told to make a "should cost" study on the Mark II avionics system by Mr. Nitze and they never would make it, they just don't like it. And it is very encouraging to me, however, to find the way

Assistant Secretary Ron Fox of the Army today has dug into this "should cost" theory and he is doing something about it.

Chairman PROXMIRE. Good.

Now, I want to know how do you explain the unwillingness of the Navy and the Air Force to use it. It is frankly a very strange reaction to us, in view of the enormous success you had with this method of analysis. One would think that after achieving a $100 million cost reduction with a management tool that management would want to use it again. Will you comment on the attitude of the Navy and Air Force? I want to know more than that they are against it. What is their reason? Why don't they like it?

Mr. RULE. Well, I think there are a lot of people that were very shocked at the success of the entire venture. I think there were people who never wanted it to succeed, who perhaps thought it was a little window dressing but it did succeed, and they have just never liked it. There may be this feeling, Senator Proxmire.

Chairman PROXMIRE. You have indicated that the Navy very much wants to reduce costs and wants to eliminate inefficiency. This is one way of doing it and we have had a dramatic success in this instance. Therefore, why shouldn't they welcome it.

Mr. RULE. It is, Senator, but I have written on the future "should cost" and I have said this, so far as I am concerned. It is a very unusual approach to take, and I think that when you take it, I think when this approach is exercised, it is almost a reflection on the service that has to do it. If the situation is so bad that you have to send in a team to make this unusual study, I think it is a reflection on us. In other words, if our NAVPROS and our AFPROS in the plants are doing their job, if they are properly staffed and they have an industrial engineering capability, they can keep on top of it, go through the plants and see whether they are efficient or inefficient. If they are doing their job, and the people in Washington are dealing with these companies at arm's length, the occasion for such an in-depth "should cost" really, if it ever arises, is a reflection that we are not doing our job.

Chairman PROXMIRE. Without any reflection on these people who are involved, they are all conscientious, hard working people, they are doing the best job they can do, I am sure, but the results of the GAO report we had yesterday were really devastating. It showed these enormous overruns, and you have been one of the frankest and clearest witnesses in pointing out there is waste and inefficiency and they are trying and not succeeding. The Navy has a tool now that may enable it to succeed. It is like a surgeon who does not want to use the scalpel because it is a reflection on his capability to operate with a penknife.

RECOMMENDS PERIODIC SHOULD-COST ANALYSIS OF SOLE SOURCE SUPPLIES

Mr. RULE. That is a hell of an analogy.

I have recommended, Senator, that DOD ought to have a group, a highly professional full-time group, of industrial engineers and cost analysts to go into these plants periodically. Each service now has a

group that can go in and scratch the surface but I think that DOD would be well advised to have a highly professional group to make periodic checks of our big procurements, and bear in mind that you don't have to do this if you are in a real competitive environment. We have always thought, and I think rightly so, that where you have genuine competition, and I am not talking about specious competition, you rely on the forces of the marketplace to get you a reasonable price. But such a group could go into our large sole source producers periodically, not in connection with any one contract but in connection with just checking the overall efficiency of that plant.

This is what Ron Fox has in mind. When he knows that he is going to make a sole source contract he wants to send these teams that he is setting up into that plant prior to the negotiation and prior to the making of the contract to get a line on just how efficient that contractor is, and I think it is wonderful.

Chairman PROXMIRE. I think it is, too. You wouldn't argue that is a reflection on the efficiency of the Army contractor in that case or the efficiency of the Army procurement officials?

Mr. RULE. Not at all.

Chairman PROXMIRE. You recognize Mr. Fox is right in doing this.

Mr. RULE. That is an additional tool.

Chairman PROXMIRE. Right.

Mr. RULE. He apparently is not quite satisfied with the amount of input that he gets from the field activity so he wants to have this added to it and go in and check and I think it is a grand thing.

ARMY SETTING UP SHOULD-COST TEAMS

Chairman PROXMIRE. Would you want to give us any more light on what the Army is doing in this particular case, their plans currently in the Army for pursuing the "should cost"?

Mr. RULE. To my knowledge, they are setting up several six- or eight-man teams. They want to train those teams, they were a little surprised, I think, when they went out and looked around the Army to find that they had this capability in a lot of places, IE's, and people that were qualified to set up these teams. Now they want to train them and put them to work and I think Ron Fox is to be really commended for doing this.

VALUE OF PRIVATE SHOULD-COST STUDY

Chairman PROXMIRE. As you know, your own Pratt & Whitney review was preceded by a similar study conducted by the Performance Technology Corp., PTC. Do you think it was useful to have had a review first by a private consultant firm? Do you see any role for the private consultant in this area or is the "should cost" approach one that can be performed exclusively in-house by the Pentagon?

Would you think you should use private consultants or exclusively in-house? Incidentally while you are answering that you can also comment on the quality of the work done by PTC and their quality in the Pratt & Whitney review.

Mr. RULE. Sir, PTC was given a contract to go into Hartford, Pratt & Whitney. The Navy asked for quotations from consulting firms,

and nobody but PTC would take the contract when they found out the limited time in which they had to do the job. They only had about 60 or 70 days. They wanted, Mr. McNamara wanted, a quick feel of what had happened up there. So they undertook to do this job in that limited time. The others said they could not do a proper job in that time.

PTC did go in and came out with a report, and I must say that PTC was at all times faced with an adversary climate from both the people in the Navy and the people at Pratt & Whitney. Neither one, neither of those two groups, gave PTC any help at all. They came out with a report which everybody tried to debunk largely because they said "You didn't have"—the very reason why these other companies dropped out—"These conclusions can't have much meaning in the time you had to make them."

Nevertheless, the report did surface and illuminate areas that we believed where there is smoke there must be some fire, and they illuminated these areas and it was after that report that Mr. McNamara decided to set up a team that I headed, and we found substantially the same things they did, not to the same degree. But it is an odd thing about these consultants. One of the recommendations we made when we finished our study to Pratt & Whitney—we made 74 recommendations—and we had no way of making them do any of them because you can't tell, you can't dictate to a company. You can point them out. But we urged Pratt & Whitney to hire their own outside consultant firm to go in and make a stem-to-stern check of their operation.

So with reluctance they did that and they got a good consultant. We in the Navy reserved the right to approve the consultant they hired and it narrowed down to four—and the one that was chosen impressed me by saying "Now it really doesn't make any difference who you choose," except for the money involved. They said "All IE consulting firms will go about the job in the same way. There is nothing mystic about it. They will all use the same techniques. The thing you have to watch for, Mr. Pratt & Whitney, is who is going to put the best men on the job, the men with the most experience," and they promised to pull in their best men from all over the country and keep them on the job, and so they got the contract and they did a good job. They again found not quite to the extent that we did, but any IE, any group, whether it is from the Department of Defense or whether it is a consulting firm, they will all find the same things because these things, if they are there, they will find them.

Performance Technology Corporation

Chairman Proxmire. And yet it seems that as far as PTC was concerned, it is a very hazardous occupation to be a private consulting firm under these circumstances because following PTC's "should cost" study at Pratt & Whitney, as you know, it was literally blackballed by the Pentagon and some of its contracts were terminated. It has not been able to get any work from the Pentagon since that time so it seems to be a hazardous occupation.

As you say, they had a lot of opposition while the study was going on and a lot of cynicism over the result of it.

Mr. RULE. There is a definite mortality rate to consultants that tell the truth.

Chairman PROXMIRE. That is a sad state of affairs. Did you say there is a definite mortality rate to consultants that tell the truth?

Mr. RULE. Sure.

Chairman PROXMIRE. Sure.

Mr. RULE. The same as it is for people in the Air Force that tell the truth. It is not confined to consultants.

Chairman PROXMIRE. Well, I hope it doesn't apply to the Navy.

Mr. RULE. I am surprised they haven't abolished my job.

Chairman PROXMIRE. That is what I was coming to.

Mr. RULE. Don't come to that.

IMPROVEMENTS AT PRATT & WHITNEY

But let me go one step farther on what Pratt & Whitney did. They hired this consultant, and this consultant went in and made a 12-week study, and they set out 29 areas as a result of that 12-week study, they set out 29 areas that should be further studied. Pratt & Whitney undertook to implement those 29 recommendations, and Admiral Galantin and Mr. Shillito and myself have twice gone up to Pratt & Whitney, we were up there 2 weeks ago getting a reading on what they are doing, and they are implementing these recommendations, and they are becoming more efficient, and I think that if we could just in some way get these large companies, and I am sure you and I could think of some names right off the bat, if we could get them to be this enlightened, self-enlightened, that they would go out and hire a good consulting firm to come in and tell them that, I think we would be way ahead of the game.

Chairman PROXMIRE. I do, too.

Mr. RULE. Mr. Staats thought that was the greatest thing that came out of the Pratt & Whitney "should cost" study, the fact that the company themselves would then retain a consultant to look over their entire operations.

SHIPBUILDING CLAIMS

Chairman PROXMIRE. Let me get into the shipbuilding claims. I think you did a very fine job in presenting that. It is new material for me and for many people in the public.

But as I understand it there are presently pending against the Navy a total of over $1 billion in claims by shipbuilding contractors. Put another way, this means that the cost of the Navy's shipbuilding program will be more than $1 billion higher than originally planned or contracted for. And this does not include shipbuilding cost increases, overruns which are not the subject of claims, such as approved contract changes and other agreed upon program modifications. Can you confirm this and give us a breakdown of the programs against which the claims have been filed? It is possible that the claims will significantly exceed $1 billion as ship construction proceeds?

Mr. RULE. Well, maybe the claims will, maybe the claims per se will. But what they are settled for or disposed of will not approximate that. We are only talking the face value of the claims, you see.

Chairman PROXMIRE. Well, that is understandable but it could be very high, it would be a considerable factor, it could be $400, $500, $600 million.

Mr. RULE. Now, you see, you are falling into the same trap these contractors are trying to get us into. If it is a billion they think we will settle for 30, 40, or 50 percent.

Chairman PROXMIRE. I understand.

Mr. RULE. I don't think you ought to even speculate on that.

Chairman PROXMIRE. Can you give us a breakdown of the programs against which the claims have been filed?

Mr. RULE. Programs by what?

Chairman PROXMIRE. Against which claims have been filed, a breakdown of the programs, the ship programs, the type of weapons system is what I am talking about.

Mr. RULE. You mean whether it is a DE or CVAN?

Chairman PROXMIRE. That is right, so we know how many claims are filed against one weapons system and against the other and so forth.

Mr. RULE. The same answer as before, Senator. I will be glad to give you that for your own internal use.

Chairman PROXMIRE. Why shouldn't that be a public record?

Mr. RULE. Well, I suppose because I just made up my mind that I didn't think it should be.

Chairman PROXMIRE. Well, in the absence of a persuasive argument it seems to me that——

Mr. RULE. That was not persuasive?

Chairman PROXMIRE. No, sir. It was not quite. In the absence of a persuasive argument it seems to me the taxpayer has a right to know what, where their hard-earned money is going when you have these enormous sums involved.

Mr. RULE. I don't want to give any shipbuilder any ideas that they don't already have.

Chairman PROXMIRE. I am not asking you about the shipbuilding firm, but the programs.

Mr. RULE. Yes, but even the programs. You see we have programs where we have a lead yard and following yards, and maybe one of the following yards has a claim and the other doesn't, so I don't want to indicate that that program has claims because this one yard is going to say "Whoops, what is the matter with me?" I just don't want to give out any information——

Chairman PROXMIRE. Doesn't that generally get known in the trade though? After all, these people with hundreds of millions of dollars involved know who files big claims.

Mr. RULE. I think you are probably right but that information is not coming from me and you are asking me for information. I am not trying to be difficult.

Chairman PROXMIRE. Well, you will supply it to the subcommittee on a classified basis?

Mr. RULE. Sure; yes, sir.

Chairman PROXMIRE. This year the Navy announced cost reductions of $350 million through the cancellation of shipbuilding or conversion programs. This is part of Secretary Laird's cutback in the military

budget. In your opinion, does this represent a cost savings by way of elimination of unnecessary programs, or was the Navy forced to cancel needed programs because the claims and other overruns had created a budgetary crisis?

Mr. RULE. What was the first part of that?

Chairman PROXMIRE. The Navy announced cost reductions of $350 million through the cancellation of shipbuilding or conversion programs.

Mr. RULE. I meant the first part of the question; did this constitute——

Chairman PROXMIRE. In your opinion, does this represent a cost savings by way of elimination of unnecessary programs or was the Navy forced to cancel needed programs because the claims and other overruns had created a budgetary crisis?

Mr. RULE. I would guess, without knowing, Mr. Chairman, I would guess it is a combination of both. How you sort it out I really don't know but I would suspect that it is a combination of both.

Chairman PROXMIRE. You don't determine how much of that $350 million does represent elimination of unnecessary programs.

Mr. RULE. No, sir, I could not.

INCREASES IN SHIPBUILDING COSTS

Chairman PROXMIRE. Last year we had testimony from Admiral Rickover of tremendous increases in shipbuilding costs, far above the annual rate of inflation. According to recent reports those costs are going up by about 20 percent per year. Is this your understanding? 20 percent per year.

Mr. RULE. I have read that.

Chairman PROXMIRE. You say you have heard that?

Mr. RULE. I have read it.

Chairman PROXMIRE. You have read that?

Mr. RULE. Yes, sir.

Chairman PROXMIRE. Do you believe it?

Mr. RULE. It sounds high to me.

Chairman PROXMIRE. What is your estimate?

Mr. RULE. Well, I think our normal escalation on labor and material is going up about 6 or 7 percent a year. I don't know where the 20 percent comes from.

Chairman PROXMIRE. What impact have the claims had on shipbuilding annual cost increases?

Mr. RULE. Come again?

Chairman PROXMIRE. What impact have claims had upon shipbuilding cost increases, this sudden escalation in claims. Can you determine that today?

Mr. RULE. I don't see why it would have any.

Chairman PROXMIRE. Well, obviously if you estimate that a program is going to cost $100 million and you have claims of $50 million, and the claims are settled at $25 million, there will be a 25-percent increase in the program.

Mr. RULE. You mean for the Government?

Chairman PROXMIRE. That is right.

Mr. RULE. I thought you meant on the contractors.

Chairman PROXMIRE. No, no; I am talking about the annual cost increases.

Mr. RULE. Obviously it is a cost growth and should be ground into it.

Chairman PROXMIRE. Now that we understand ourselves, is the 20-percent cost increase to the Government per year in ship construction, is that a fair estimate or is that, do you think, high?

Mr. RULE. Well, the figure of 20 percent that I have read, Senator, has not just been in connection with shipbuilding. It has been across the board. It has been used, as I read it, as an inflationary figure across the board.

Chairman PROXMIRE. You just told us that materials and labor are about 6 percent. Here is a terrific discrepancy.

Mr. RULE. Six or 7 percent; it may be more than that.

Chairman PROXMIRE. What is the reason for this enormous discrepancy, what is the reason we get a cost inflation three times the explicable inflationary cost?

Mr. RULE. I should suggest you ask the man who gave you the figure. Admiral Rickover is the great unsung procurement expert. Why don't you ask him?

Chairman PROXMIRE. Well, Admiral Rickover isn't before the subcommittee this morning and you are, and you are an outstanding expert.

Mr. RULE. I know, but you said he was the one who mentioned 20 percent.

Chairman PROXMIRE. Yes, sir; and you said you had read it and that you thought it may be high.

Mr. RULE. I didn't read him saying it. I read that several places just recently. I didn't know it emanated from him.

Chairman PROXMIRE. Then you can't give us any enlightenment whether 20 percent is right or wrong?

Mr. RULE. As to whether what is 20 percent?

Chairman PROXMIRE. Twenty-percent increase in cost of construction?

Mr. RULE. Of ships?

Chairman PROXMIRE. Yes, sir.

Mr. RULE. No——

Chairman PROXMIRE. Cost to the Government.

Mr. RULE. No, sir; I cannot.

AMOUNT OF CLAIMS ABNORMAL

Chairman PROXMIRE. All right, sir.

A billion dollars in claims seems to me to be an incredible amount of money for contractors to be demanding from the Government for costs over and above the contract prices. Is this an unusual amount of shipbuilding claims, or have we always had a proportional amount pending? What has been your experience?

Mr. RULE. This is most unusual and most abnormal.

Chairman PROXMIRE. How does it compare?

Change in the Shipbuilding Industry

Mr. Rule. Well, it is so far and away more than what we have ever had, the reason for this, I think that certain things have happened. I think we all, down in the Navy, I know, we are very short of capable personnel. We have ceilings on personnel. That is applicable especially to people making contracts. I think this means inefficiency. I think that contractors today—the whole shipbuilding industry has changed, Senator. In the past Newport News, New York Ship, Electric Boat, Bath Iron Works, Ingalls down in Pascagoula, they were almost family affairs, and it was almost that relationship between those companies and the Navy. There was never—if the Navy wanted something the companies would do it. You would call up John Newell at Bath and he would do it and he wasn't thinking in terms of claims, how many dollars he could get.

Now, the whole scene has shifted. These are not private concerns any more. They are parts of big conglomerates; the Littons, the Tennecos, and those people.

Chairman Proxmire. Is this also, perhaps, part of what you described to us 6 months ago or so as a matter of playing games, the contractors were playing games with the Government? They were disingenuous with their estimate. They make estimates that they know are likely to be low; if they are low they will file a claim and make up for it?

Mr. Rule. No, sir. I will get back to disingenuous, but this is nothing to do with what I am talking about now.

Chairman Proxmire. You are talking about the fact we did have reliable, established family firms whose word was as good as their bond and they were very proud of that and now you have——

Mr. Rule. That is right, and they were not interested in seeing how many claims they could have, how many dollars they could squeeze out of every contract.

I think it is perfectly natural that these holding companies now are taking an entirely different look at it and I think that practically this has left the NavShip Systems Command still in the old fashioned way of doing business, whereas the other side of the coin has become quite radically different.

Chairman Proxmire. In recent years, almost every formerly independent shipyard of any size has been acquired by conglomerates. Has this had anything to do with cost increases and in shipbuilding inefficiency, in your opinion, or does it relate strictly to the attitude on claims.

Mr. Rule. I don't think it has anything to do with inefficiency. As I just said, though I think that these hardheaded conglomerates, when they go into a plant, when Tenneco goes into Newport News, they are not going to think of the old family tie, "Hello, Joe" relationship. They want to make that yard pay off and you can't blame them, and I think they are looking for every dollar that they can get.

Effects of Complicated Contracts

Chairman Proxmire. It was suggested in the press last week, in an excellent article by Orr Kelly of the Washington Star, that fixed-

price contracts entered into in the early sixties have contributed to the large claims now pending. According to this explanation, when costs exceeded the shipbuilders' expectations they began going over their contracts looking for violations on the part of the Navy. They found them and the claims resulted.

My question is this: Are large contracts for weapons systems like warships so complicated that on virtually any one it is possible for a contractor to find a variance on the part of the Government and a claim for a breach of contract? Is the very complexity of contracts for modern weapons systems such that a contractor always has the alternative of claiming that the Government has violated it?

Faulty Administration

Mr. Rule. I think generally speaking the answer to that question is Yes. This is why I, in my statement, sir, have to bear down on this question of late delivery of Government-furnished material and primarily the nuclear components that go into these ships, because I know, I have cases in front of me where we have given a contractor a contract to turn out a ship or ships by a certain date, and he is tied to that contract, that date, and we don't supply the nuclear components in time for him to meet that date.

Now, the minute we do that, the minute we miss that Government-furnished material delivery date he has a claim. There is some thinking that he might work around a space where the component is missing from, and theoretically, I guess, this is true. But he has a claim, and what I don't want to see perpetrated is making these contracts with delivery dates that are known to be phony, when you know that the Government-furnished propulsion machinery is going to be 1 year late and we will make a contract and definitize the contract that we know is just asking for claims. Now, that is why——

Chairman Proxmire. These contracts are being made, where the Navy knows, the contractor knows, they are going to be late but they feel that can be taken care of with a claim?

Mr. Rule. Well, the contractor certainly knows it, and I certainly know it but some of the people that direct that these things be done seem to feel that, "Well, that didn't happen on my watch. I made a contract and here is the price. If there is a claim later don't tell me about it. That is faulty administration."

Advertised Competitive Bidding

Chairman Proxmire. I am concerned about the implications of this, I think you have made a very strong case here for not procuring on a fixed-price basis and for not using advertised, competitive procurement in these instances. At the same time this has been the greatly preferred method of procurement by the Congress. We are anxious that overall in all procurement that advertised competitive bidding be used much more than it has been. How firm do you feel about the inappropriateness of advertised competitive bidding in your field?

Mr. Rule. Senator, this is one of the points, and it is a good one and I know you are concerned about it, about why there isn't more formal advertisement.

This is one of the areas that I think this Holifield Commission can look into. I would hope that the law could be amended, the Armed Services Procurement Act frankly, could be amended, to put less emphasis on formal advertised procurement just the same as I hope that it will look into the question of trying to get small business people more prime contractor dollars.

I mean, I don't think—I think formal advertising is overdone, and we strain to formally advertise in cases where we shouldn't. There are a lot of things that should not go on the basis of low price alone and that is what formal advertising does.

Small Business

In the area of small business, I would hope the Holifield Commission could really take an in-depth look at that because I think we are doing small businessmen a disservice when we give them a prime Government contract. A lot of these small businessmen are not used to playing in this league. I think they are much better off getting defense dollars as subcontractors in that league rather than up here in this league where they don't have the facilities, the lawyers to advise them, and it is just, I don't think we do them any favor, I really don't. And I would hope in both the advertised procurement area and in the small business area that this could be looked at as it should be over a period of time.

Chairman Proxmire. I am sure you are not implying there are not some small business firms that are qualified, who know what they are doing who should bid and get prime contracts. But it is a warning that unless it is a firm that has that competence in personnel, it should be very cautious because they can lose a great deal.

Mr. Rule. They are in a different league, Senator, and all you have to do is look in the various activities and look at their contracts that are terminated for default and they are almost all small business people that bid and didn't know what the hell they were bidding on and couldn't handle it and it is unfair to those people. They are much better off, in my opinion, and I would advise them if I had any way to do it, to take, to get into the subcontract league.

DE–1052 Claim by Todd Shipyard

Chairman Proxmire. I understand that you headed a special team that looked into the claim by the Todd Shipyard on the DE–1052 program. How much was their original claim and how much were they awarded?

Mr. Rule. The original claim was $114 something and they were awarded $96.5.

Chairman Proxmire. You are talking about millions of dollars?

Mr. Rule. Yes, sir.

Chairman Proxmire. $114 something million and they were awarded $96.5?

Mr. Rule. Yes, sir, and the face value of their contracts was $151 million which they got by formal advertising.

Chairman Proxmire. The face value was what?

Mr. Rule. $151 million.

Chairman PROXMIRE. $151 million which they got by formal advertising?

Mr. RULE. That is right.

Chairman PROXMIRE. Does Todd have additional claims pending on the same program?

Mr. RULE. No, sir.

Chairman PROXMIRE. Can you provide the subcommittee with a copy of your report on the Todd claims or can you summarize it for us today?

Mr. RULE. No, sir.

Chairman PROXMIRE. Why not?

Mr. RULE. I just made another decision. [Laughter.]

Chairman PROXMIRE. Why?

Mr. RULE. Well, sir, again Todd was a lead yard for the 1052 class, and there are two following yards who have claims pending right now for their portion of the 1052 class, you see, and it would be most inappropriate for me to say what I found in the Todd case. It might not be even applicable to the following yards but again at the proper time you are certainly welcome to it but not for publication.

Chairman PROXMIRE. Let me read something to you and get your reaction and I quote it "the Navy will have claims, overruns and every other conceivable type of additional costs, because many persons in the Navy think only in terms of their own small part in the overall scheme of things and fail to comprehend that to admit a mistake or admit that a specification is defective and therefore that buyer corrective action must be taken, is the proper way to assist the Navy to work out of an unfortunate situation in the best way possible. A prime example of failure to so understand and act is the Todd claim."

Does that statement fairly summarize part of your conclusions based on your investigation of the Todd claims?

Mr. RULE. I am not being facetious but would you read it again?

Chairman PROXMIRE. All right, sir, I will read it a little more slowly:

> The Navy will have claims, overruns and every other conceivable type of additional costs, because many persons in the Navy think only in terms of their own small part in the overall scheme of things and fail to comprehend that to admit a mistake or admit that a specification is defective and therefore that buyer corrective action must be taken, is the proper way to assist the Navy to work out of an unfortunate situation in the best way possible. A prime example of failure to so understand and act is the Todd claim.

Mr. RULE. That is about the mildest statement you could make about the Todd claim.

Chairman PROXMIRE. Now, how about making a fair statement on it?

Mr. RULE. I am finished. That is about the mildest you could make, but it is accurate.

Chairman PROXMIRE. It is accurate?

Mr. RULE. Yes, sir. Who wrote it?

Chairman PROXMIRE. Who wrote it?

Mr. RULE. Dick Kaufman?

Chairman PROXMIRE. It is my understanding, Dick Kaufman said he didn't write it, I didn't write it, but the feeling up here is that Gordon Rule wrote it.

Mr. RULE. No, sir. That doesn't sound like Gordon Rule. If I had written that statement it woud have been a lot stronger than that really. I did not write that statement. As I say, that is the mildest interpretation you could put on it.

(Mr. Rule subsequently determined that he had written that statement as part of his Todd study.)

Chairman PROXMIRE. What was the cause of the Todd claim?

Mr. RULE. These are the various elements that made up the Todd claim: dynamic analysis requirement, shock specifications, noise specifications, sonar space changes, full-scale machinery mockups, late Government-furnished information, unadjudicated change order, defective specification and constructive changes, administrative failures of the Government, out of sequence construction. That is as far as I am going on the Todd case. You asked for the elements.

Chairman PROXMIRE. Well, do you want to say that it was the Navy's fault primarily or the contractor's fault or both?

Mr. RULE. I told you that the claim was $114 million, and they got $96.5 million. Doesn't that answer your question?

Chairman PROXMIRE. Well, it depends on the judgment.

Mr. RULE. I am not in the business of giveaways.

EARLIEST RECOGNITION OF CLAIMS SITUATION

Chairman PROXMIRE. When did the Navy first recognize this situation?

Mr. RULE. I read something on that just recently. I believe that it was in the—that is not an easy question because some people recognized it earlier than others. My recollection is that contracts were made in July of 1964, and there were signs that should have made people recognize these claims coming in late 1964 and 1965. I believe the record will show that they were starting to emerge with some clarity about 1967; is that right, Mr. Kaufman, about the latter part of 1967?

Chairman PROXMIRE. Mr. Kaufman confirms that is his judgment, too.

So that you think that the Navy should have recognized the fact that corrective measures were not taken and substantial claims would probably be filed by the contractor by 1967 the latest, and they should have had some indication of this in late 1964 and early 1965; is that correct?

Mr. RULE. I will let my statement stand, sir.

Chairman PROXMIRE. I see.

Did the Navy ever take any action to prevent or mitigate the claims once it became clear that they would probably be filed?

Mr. RULE. Take any action to mitigate?

Chairman PROXMIRE. To prevent or mitigate the claims once it became clear that they probably would be filed?

Mr. RULE. In that particular case, I think I can say that when it really became clear and became understood and appreciated, I think it was too late to really mitigate. The damage had been done.

Chairman PROXMIRE. So no action was taken, to the best of your knowledge, to try to mitigate?

Mr. RULE. There was no action that could have been taken, really. I beg your pardon; they did. There came a time when they recognized

that they had to give the contractor some relief from this dynamic analysis specification which was brand new. It was the first time that dynamic analysis had ever been required by the Navy for surface ships, and it just, it required a great deal—the Bureau reserved to itself the approval of the dynamic analysis equation that the contractor had to get up, and they were late in giving them approval of these equations.

They finally did reach a point where they had to waive the dynamic analysis when it became very clear indeed that they could not meet it and could not build the ships.

Chairman PROXMIRE. Were proper reports given to higher headquarters by those in the field informing it of the problem which would likely lead to the Todd claims or of the situation once it began to develop?

Mr. RULE. At what time, Senator?

Chairman PROXMIRE. At any time during this period, in late 1964 until the claim was filed. I am asking were any reports given by people in the field that were alerted to higher headquarters?

Mr. RULE. Not——

CONTRACT SPECIFICATIONS POLICY

Chairman PROXMIRE. Of course, the following question is, if they were so alerted, why was action not taken by higher headquarters?

Mr. RULE. No. I do not recall that there was any real running up of red flags over this situation. It was almost the reverse. People just wanted it to go away and "don't bother me," sort of thing, which actually made the contractor get up a claim. That was the attitude. "We are not going to deviate from these specs. You are a big boy. You signed a contract. Now, get to work."

Chairman PROXMIRE. Is that a wise course or was that the only course the Navy could have followed?

Mr. RULE. No; it was a most unwise course. They should have recognized it.

I will just say this about the Todd case. The contractor came in 3 months after he got the contract and he said, "In accordance with paragraph so and so of my contract I am supposed to alert you to any problems which appear to me to be potential delaying problems."

So he notified the Navy of three potential areas and, as I say, he sent this very nice letter in accordance with the conditions of the contract.

The letter that went back from the Navy said "drop dead." We don't recognize this as potential. Get on with the contract, just that blunt, and I always have said, and I still say, that contractor we made him start getting a claim up that day.

Chairman PROXMIRE. If the Navy had reacted sympathetically and understandingly and gone into it in depth, is it your understanding that they would have saved money for the taxpayers, substantially?

Mr. RULE. Yes. There are many things we could have done. We could have waived a specification requirement. We could have extended the delivery schedule. We could have negotiated an equitable adjustment at that time. There were several things that could

have been done; but we literally told the contractor "Go drop dead and get on with the contract."

Chairman PROXMIRE. After the claims were paid, were any measures adopted to prevent such claims from arising again on other shipbuilding contracts?

Are you going to be able to prevent this in the future when contractors write in, are they going to be told to drop dead?

Mr. RULE. In my opening statement, Senator, I stated to you that I had great confidence in Admiral Sonenshein and Admiral Gooding to correct this situation.

Chairman PROXMIRE. What steps are they taking specifically?

Mr. RULE. They have not been there long enough to take any discernible steps, they really have not. But they know, as I said in my statement, they have this Todd report, they know everything that went wrong, and there is no reason, in my opinion, why they cannot take the necessary steps to see that that is not repeated. It won't be easy, it won't be easy to make changes because these people on the various type desks and who are responsible for the specs, it is not easy to get them to admit that this is a bum spec and, therefore, the contractor ought to get relief. But I am sure, and I want to repeat it that Admiral Sonenshein and Admiral Gooding know about it.

CONTRACTOR RESPONSIBILITY

Chairman PROXMIRE. The Navy takes the position it was the Navy's fault in the Todd case, and in your response that is evident in the arithmetic of the settlement, 85 percent roughly of the claims filed.

Was there any substantial fault on the part of the contractor or does this reflect pretty fairly——

Mr. RULE. The $96.5 million reflects what our best judgments in the Navy indicated were the dollars that should be hung on our responsibility, and I know it is 60-some percent of the original face value, and it sounds awful high.

Chairman PROXMIRE. You see, my point is, you reviewed the case after that money was paid, you reviewed it, and I am asking for your expert judgment.

Mr. RULE. I reviewed only the causes after it was paid. I was told, I was given the assignment, "OK, now we have paid this claim, I want you," Admiral Galantin said, "to tell me what caused it." He said, "I want you to find the causes, the root causes. I want you to name names of responsible people," and that I did.

Chairman PROXMIRE. Well, now I am asking you to what extent was the contractor responsible. You made the study.

Mr. RULE. Well, he was not very much responsible when we paid him $96.5 million. There was that much merit in his claim.

Chairman PROXMIRE. You feel the settlement was about right?

Mr. RULE. I do indeed.

LATE DELIVERY OF GOVERNMENT FURNISHED EQUIPMENT

Chairman PROXMIRE. I understand that a large part of the shipbuilding claims are based on delays in construction caused by the Navy in that it failed to make timely delivery of what is called Government-

furnished equipment. This refers to items built by contractors for the Navy other than the shipbuilders and delivered to the shipbuilder by a specified time.

I also understand that in at least some of the cases the Navy and possibly the shipbuilder knew or should have known that the Government-furnished equipment would not be delivered on time. Is this your understanding? Why do the parties enter into contracts when they know that some of the schedules cannot be met?

Mr. RULE. You should think somebody had read a copy of my notes, and I swear this is the only one around. That is just what——

Chairman PROXMIRE. I realize that you covered that to some extent. We did not have your notes in advance.

Mr. RULE. No, I know nobody did.

Chairman PROXMIRE. I wondered if you wanted to elaborate on that to some extent.

Mr. RULE. That is absolutely right, Senator. When we make a contract to deliver a ship at a certain date the contractors should bid to that date; and then we ought to have this line of balance which clearly shows that this is a realistic date tested by when the Government-furnished material, especially the nuclear propulsion, will get there, and if it does not test out, if he has to have it 8 months ahead or 10 months ahead and we know he won't get it until after the delivery date of the ship passes, it is a phony contract, and this is exactly the sort of thing that topside in the Navy is not going to permit.

We have gotten burned on this?

DE–1052

Chairman PROXMIRE. Let me review the facts on the DE–1052 program which we mentioned briefly before.

First, tell us what kind of ships these are and what their intended use is, the DE–1052.

Mr. RULE. I am a procurement specialist. It is a destroyer escort. You know as much about what a destroyer escort is for as I do. There are a lot of people who could describe their function a lot better than I could, Senator.

Chairman PROXMIRE. I am simply asking whether this destroyer escort is novel, represents an advance in the state of the art in any way, is it faster, is it larger, does it have greater potential firepower or efficiency?

Mr. RULE. There is a man sitting behind me in the audience who can answer that if it is material, if you are anxious to get it.

Chairman PROXMIRE. I am sure, Mr. Rule, you know enough about the DE–1052 to tell us whether it is something that involved, in your view, a large advance and, therefore——

Mr. RULE. Yes, sir; it was an advance, and it had a lot of sophisticated components on it.

Chairman PROXMIRE. Was this primarily an antisubmarine warfare ship?

Mr. RULE. I do not know whether it was primarily ASW or not.

Chairman PROXMIRE. Who is the man in the audience, does he want to identify himself? Just stand and identify yourself and tell us about this. We can hear you from there, if you will sound off.

STATEMENT OF GEORGE C. WELLS, CAPTAIN, U.S. NAVY (RETIRED)

Captain WELLS. George Wells, sir. I am captain, U.S. Navy, retired, now with a trade association in town.

Chairman PROXMIRE. All right, sir.

Captain WELLS. I was Director of Contracts at the time the DE–1052 contract was awarded.

I am a shipbuilder by training, sir, prior to the time I was Director of Contracts for the Bureau of Ships.

Chairman PROXMIRE. I am simply asking you, sir, to tell us about this ship, this DE–1052. Was it primarily an antisubmarine warfare ship; did it have any specially distinctive features that made it new and, therefore, more expensive, and so on?

Captain WELLS. Sir, I believe its descriptive title as a destroyer escort, DE, indicated that fundamentally it is a ship designed to protect ships in movement, not itself be a hunter-killer submarine. It, of course, is fundamentally a submarine-killing ship when used in that context.

Its equipment is highly sophisticated electronics equipment. This was the first series of ships. We believe the SQS–26, finally produced, the SXS–26CX is the most sophisticated sonar the Navy has yet used. It has a separate variable-depth sonar which, frankly, sir, I have been long enough disassociated from the program not to know what is aboard.

This is a towed variable depth sonar, always with the purpose of locating and discovering submarines.

Its armament, Mr. Chairman, I am not fully familiar with its armament per se. It is a highly advanced destroyer escort, sir.

Chairman PROXMIRE. I think that describes it concisely. Thank you, sir.

DATES AND AMOUNTS OF CONTRACTS

My understanding, Mr. Rule, and correct me if you think I am wrong, is the first 26 ships were awarded July 1964. The total price was $292.5 million. The contractors were Todd, Avondale, and Lockheed. In August 1966, contracts for 20 additional ships were awarded to Avondale. The price was $217.7 million. This made a total of $510.2 million for 46 ships.

The first ship was delivered to the Navy by Todd in March 1969. Is it fair to say that this ship entailed large cost overruns and that it was delivered 20 months late?

Mr. RULE. Obviously, sir; yes.

Chairman PROXMIRE. The answer is "Yes", there were large cost overruns and it was delivered 20 months late?

Mr. RULE. If you are including the claim as an overrun, which you have to——

Chairman PROXMIRE. I presume we do.

Mr. RULE. Yes.

Chairman PROXMIRE. It was paid.

Mr. RULE. That is right.

COST OVERRUN

Chairman PROXMIRE. So, of course, it is.

Todd has contracts for 14 ships. Can you tell us what the costs of those ships was supposed to be and what they will be?

Mr. RULE. No, sir; I cannot. I will supply it for the record.

Chairman PROXMIRE. Will you supply that for the record?

(The information follows:)

Todd's 14 ships *were* expected to cost the contract price ($151.177M) *plus* adjustment for escalation based on labor and material indices furnished by the Bureau of Labor Statistics *plus* adjudicated cost of change orders.

Todd's 14 ships *are* expected to cost the contract price ($151.177M) *plus* escalation *plus* adjudicated change orders *plus* the claim settlement ($96.5M).

DELIVERY DELAY

Chairman PROXMIRE. Why was it—can you explain why it was 20 months late?

Mr. RULE. Oh, yes, sir. That was one of the bases for their claim was because the Government-furnished equipment, this SXS–26 sonar that Captain Wells just mentioned, this variable depth sonar, this dynamic analysis, this new shock specification, they just could not meet the specification for a dynamic analysis and shock treatment.

Chairman PROXMIRE. Why couldn't they get the equipment? Why was it not foreseen that it would take this long to get that equipment ready?

Mr. RULE. Because we goofed.

Chairman PROXMIRE. Because the Navy was wrong?

Mr. RULE. Because we goofed.

Chairman PROXMIRE. Because you goofed.

Tell us the name of the first ship.

Mr. RULE. I do not know the name of the first ship.

Chairman PROXMIRE. U.S.S. *Knox?*

Mr. RULE. I do not even know if it is the *Knox.*

Chairman PROXMIRE. It is my understanding it was the *Knox;* I could be wrong.

LACK OF EQUIPMENT

Is it also true that the ship delivered by Todd was not equipped with either the proper electronics or the proper armaments when it was delivered 20 months late?

Mr. RULE. It did not have the variable depth sonar; that was not on.

Armament, I had not heard that it did not have the proper armament.

Chairman PROXMIRE. All right. Let me read you from a memorandum prepared by the staff:

The DE 1052 ship does not have the electronics and armament which was included in the original contract. Present status of DE 1052 is as follows:

Electronics. (*a*) "Teams" (AN/SSM–5). Made "post construction" by changes 147 and 195. (*b*) Variable Depth Sonar (VDS). Made "post construction" by change 146 dated 27 September 1966. (*c*) AN/SQS–26 Sonar. Installed. Equipment was deleted by change 145 dated 27 September 1966 and later reinstated by change 180 dated 24 October 1967 when the equipment became available. Contract modification No. A480 dated 7 December 1967 cancelled the changes and reinstated the requirement for installation. (*d*) ECM (Electronics Counter

Measures). AS/1750/SL and AN/SLA-12 antennas made "post construction" by change 150 dated 27 September 1966. AN/ULQ-6 and AN/WLA-3 ECM equipment made "post construction" by change 148 dated 27 September 1966.

So much for electronics.

Now, for armament:

(*a*) Mk 25 Torpedo tubes. Deleted and made a reservation by change 142 dated 19 October 1966. (*b*) DASH (Drone Anti-Submarine Helicopter). Was deleted and made a reservation by change 149 dated 31 October 1966. (*c*) Self Defense Missile System. The reservation for Sea Mauler was changed to specify Self Defense Missile System by change 42 dated 11 March 1965. (*d*) System not installed. 5''/54 caliber gun. Installed but inoperative due to failure of 150 switches affected by the degaussing system. (*e*) ASROC (Anti-Submarine Rocket). Installed and operates fairly well but lacks minor changes such as ORDALTS and change 206. Shock test on 30 September 1969 destroyed the government furnished launcher whereas the contractor furnished leading equipment was undamaged.

So it would seem that the answer to the question, is it true that the ship delivered by Todd was not equipped with either the proper electronics or proper armaments, the answer is that it was not.

Mr. RULE. I assume what you read is absolutely accurate, and that you can only come to one conclusion.

Chairman PROXMIRE. Let me ask you can you explain why the ship was delivered to the Navy and why the Navy accepted delivery when it knew it did not have the proper electronics and did not have the proper armament?

Mr. RULE. I do not know that the ship was accepted. Mr. Kaufman, was it accepted?

I know it went on some trials. I do not know whether it was—whether those things were missing when it was accepted.

Chairman PROXMIRE. Well, in the condition in which the ship was delivered, and on the assumption that this document from which I read was accurate, could it perform its intended mission?

Mr. RULE. Not fully, of course.

Chairman PROXMIRE. To the best of your knowledge, does this ship now have the proper electronics and proper armament?

Mr. RULE. I have not the slightest idea, Senator. That is so far out of my field that you need to call somebody from the shipbuilding-type desk to ask that sort of question.

Chairman PROXMIRE. How do you know a claim is justified if you do not know what is on the ship? You have told us that you thought the claim was justified and that you went along with the $95 or $96 million settlement. How can you say that it was justified when you cannot tell us now what was on the ship and what was not?

Mr. RULE. I am not sure that it necessarily follows that because I cannot tell you what is in the ship now and why the Navy accepted it without those things, I am not sure that you can—you can if you want—but take the big jump, how do you know the claim was good? The claim, we scrubbed pretty good, and we thought it was satisfactory.

Chairman PROXMIRE. It seems to me that that claim would have to be based in part on what was actually delivered.

Mr. RULE. The ship had not been delivered, in my recollection, the ship had not been delivered, when the claim was settled; isn't that right?

DELIVERY OF U.S.S. "KNOX"

Chairman PROXMIRE. The first ship was delivered in March of 1969, as I understand.

Can you give us the delivery date for the record now?

Mr. RULE. No, sir.

Chairman PROXMIRE. For the record.

Mr. RULE. Oh, yes. The 1052?

Chairman PROXMIRE. Yes, sir.

(The material referred to follows:)

DE 1052 was delivered on 28 March 1969.

Chairman PROXMIRE. Who will ultimately bear the expense of placing the proper electronics and armament on the ship, the Navy or the contractor?

Mr. RULE. A good question and I do not know the answer.

Chairman PROXMIRE. Will you supply that for the record?

Mr. RULE. Yes, sir.

Chairman PROXMIRE. And in your view, who should pay these costs?

(The material referred to follows:)

The Government will bear the cost of placing undelivered Government-furnished electronics and armament on the ship.

CONDITION OF SHIP WHEN DELIVERED

Chairman PROXMIRE. I now want to read you from a memorandum to the Chief of Naval Operations from the prospective commanding officer of the U.S.S. *Knox*, the ship in question, dated March 7, 1969:

For the moment, the deck equipment remains too heavy and cumbersome; the engineering plant has leaky machinery, is vulnerable to simple casualties, and is difficult to maintain; the electronics suit is incomplete; communications and supply personnel have inadequate working facilities for their known everyday tasks, and the allowance and manning of the BT/MM/SK ratings is critically below minimum acceptable levels. All these problems have been mentioned in detail in previous reports, in separate correspondence, or in PCO submissions for Builders Trials and PAT.

Now, have you seen this memorandum before?

Mr. RULE. No, sir.

Chairman PROXMIRE. Does this describe the condition of the *Knox* in part, when it was delivered, as far as you know?

Mr. RULE. I have no knowledge one way or the other.

Chairman PROXMIRE. You do not know whether it does or not?

Mr. RULE. No, sir.

Chairman PROXMIRE. Will you verify that for the record?

Mr. RULE. Verify what?

Chairman PROXMIRE. Verify whether this is accurate for the record.

Mr. RULE. I do not know what it is.

Chairman PROXMIRE. I just read it and you will have a chance to see it when you read the transcript, and you can verify whether this description——

Mr. RULE. If I can see his description.

Chairman PROXMIRE. Of course, you can.

Mr. RULE. I will be glad to verify it.

Chairman PROXMIRE. All right, sir.

(The material referred to follows:)

The referenced progress report was accurate in describing the condition of *Knox* in part, but two weeks *before* delivery. Many deficiencies were corrected by the builder prior to delivery; remaining deficiencies were corrected by the Bremerton Naval Shipyard in a regularly scheduled fitting out availability following delivery of the ship.

RESULTS OF SHOCK TEST

Chairman PROXMIRE. Are you aware the *Knox* underwent a shock test from September 26 to September 30, 1969?

Mr. RULE. What were those dates?

Chairman PROXMIRE. September 26 to September 30 of this year.

Mr. RULE. No, sir; I was not aware of that.

Chairman PROXMIRE. Are you familiar with the fact that part of the electronic equipment on this and the armament was damaged or was destroyed during this test?

Mr. RULE. I have no knowledge one way or the other, sir.

Chairman PROXMIRE. Did you know the ASROC missile launcher was totally destroyed in the test?

Mr. RULE. No, sir; and I do not have any compunction to ever say I do not know.

Chairman PROXMIRE. I appreciate it.

Mr. RULE. But I do not know why this line of questions is being directed to me when you know and Mr. Kaufman knows that I do not know the answers.

Chairman PROXMIRE. The reason I am asking the questions, of course, here is a ship on which an enormous payment has been made, and the taxpayer is already out $96 million, and then the ship was delivered with inadequate armament, inadequate electronic equipment on it.

They tried a shock test, and the armament that was there was damaged, and in addition, two of the radars were damaged; one of the gun hoists was damaged, and the communications system was damaged.

Now, Mr. Rule, given the conditions of the U.S.S. *Knox* when it was delivered, the lack of electronics and armament, and the fact that much of the equipment and armament on the ship was destroyed or damaged during the shock test, what is your opinion about this ship?

Mr. RULE. I do not have any opinion about this ship, Senator. You are asking me to make some assumptions which I cannot make. You are asking me to believe in the accuracy of everything you have read, which I am not going to do. I cannot answer your question.

Chairman PROXMIRE. Well, let me ask this——

Mr. RULE. Conversationally if we were talking about this together I guess we would say that sounds like a hell of a ship. But I cannot answer your question categorically when I do not know the facts, and we are still partners, remember? [Laughter.]

Chairman PROXMIRE. I hope so.

Is it normal or routine practice for the Navy to accept delivery of ships in the condition of the U.S.S. *Knox* as we have described it?

Mr. RULE. Assuming that your description is accurate, which I do not, the answer is, "No."

Chairman PROXMIRE. Has this situation ever occurred before or since, to the best of your knowledge?

Mr. RULE. I know that there are a lot of things that go wrong with ships when they are delivered, and they are on their trial runs. There are a great many things, as I recall, that are wrong—I should not say a great many, but there are some things wrong—with the *Kennedy*. There is a list of things that have to be corrected about the *Kennedy*. This is par for the course to some extent on every new ship, Senator.

Now, the degree, obviously the degree, that you have read is pretty shocking if it is true.

Chairman PROXMIRE. It sure is. This is more than just a matter of degree, isn't it? After all, much of the equipment was missing, some of the armament was missing, important armament. There is a shock test and it destroys some of its most vital equipment.

Mr. RULE. That is right.

DELIVERY DATES OF OTHER DE–1052 SHIPS

Chairman PROXMIRE. Have any other ships in this DE–1052 series been delivered, as far as you know?

Mr. RULE. Yes; there have. I know there have, but I do not know which ones.

Chairman PROXMIRE. You do not know how many. Will you give us that for the record?

Mr. RULE. Yes, sir.

(The information follows:)

Six (6) DE 1052 Class ships have been delivered to date:
DE 1052 (Todd Seattle)—28 Mar 69
DE 1055 (Todd Los Angeles)—27 Jun 69
DE 1056 (Avondale)—22 Aug 69
DE 1053 (Todd Seattle)—14 Nov 69
DE 1058 (Todd Los Angeles)—21 Nov 69
DE 1059 (Avondale)—12 Dec 69

CONDITION OF OTHER SHIPS WHEN DELIVERED

Chairman PROXMIRE. And also if any have been delivered, in what condition they are in, or are the conditions that of the *Knox* or different.

(The information follows:)

Ships delivered subsequent to KNOX were in similar condition concerning missing Government-furnished electronics and armament and in better condition concerning Contractor-responsible deficiencies.

Chairman PROXMIRE. Now, as I said earlier, the total original price for the 46 ships was $510 million.

CURRENT COST ESTIMATES FOR DE–1052 PROGRAM

Can you give us an estimate or do you know of any estimate of the total cost of these ships at present?

Mr. RULE. Sir, I have seen estimates but I really do not remember them. I have seen estimates of this recently in writing. I will supply that.

Chairman PROXMIRE. Supply that for the record?

Mr. RULE. Yes, sir. I have seen that but I do not recall.

(The information follows:)

As indicated, the shipbuilding contracts were awarded for $509.88M.

The current basic construction cost estimate is $642.38M. The increase is a result of settlement of the Todd claim and the previously mentioned payments for escalation, payments for adjudicated change orders (including those for sonar checkout) and a contingency amount held for settlement of existing contractor claims. (The above data and cost figures are detailed in the September 1969 SAR.) However, the total end cost in the original planning estimate for these 46 ships was $1.286 billion; the latest SAR report of 30 September 1969 estimates a total end cost of $1.396 billion, or a growth overall of 8.6 percent.

Chairman PROXMIRE. As I also said earlier, the first ship was 20 months late. Can we expect similar late deliveries of the remaining ships?

Mr. RULE. Well, certainly so far as Todd is concerned. That was their lead ship, their first ship. Certainly the others all fell back.

Chairman PROXMIRE. How late do you estimate the remaining ships will be?

Mr. RULE. I cannot estimate.

Chairman PROXMIRE. You have no estimate?

Mr. RULE. No, sir.

Chairman PROXMIRE. Are you familiar with the fact that the Todd——

Mr. RULE. They must all have today new revised delivery schedules which are available.

Chairman PROXMIRE. Will you get that from the Navy for the record?

Mr. RULE. Yes, sir.

Mr. Kaufman, will you now remind me of the questions?

Chairman PROXMIRE. Yes, sir; we will do that.

(The information follows:)

DELIVERY STATUS OF REMAINING DE 1052 CLASS SHIPS

	Delivery	Months late
Todd Seattle:		
DE 1053	Nov. 14, 1969[1]	24
DE 1054	Mar. 27, 1970	24
DE 1062	Aug. 15, 1970	25
DE 1064	Dec. 31, 1970	25
DE 1066	Apr. 30, 1971	25
DE 1070	Aug. 31, 1971	25
Todd Los Angeles:		
DE 1055	June 27, 1969[1]	14
DE 1058	Nov. 21, 1969[1]	16
DE 1060	Mar. 20, 1970	17
DE 1067	July 17, 1970	18
DE 1071	Jan. 22, 1971	21
DE 1074	May 21, 1971	22
DE 1076	Sept. 17, 1971	23
Lockhead:		
DE 1057	May 11, 1970	20
DE 1063	May 28, 1971	29
DE 1065	Sept. 24, 1971	30
DE 1069	Jan. 28, 1972	31
DE 1073	May 26, 1972	32
Avondale:		
DE 1056	Aug. 22, 1969[1]	15
DE 1059	Dec. 12, 1969[1]	16
DE 1061	Feb. 20, 1970	15
DE 1068	Apr. 17, 1970	14
DE 1072	June 12, 1970	13
DE 1075	Aug. 7, 1970	12
DE 1077	Sept. 14, 1970	10
DE 1078	Nov. 20, 1970	4
DE 1079	Jan. 8, 1971	4
DE 1080	Feb. 26, 1971	3
DE 1081	Apr. 16, 1971	3
DE 1082	June 4, 1971	4
DE 1083	July 23, 1971	4
DE 1084	Sept. 10, 1971	5
DE 1085	Oct. 29, 1971	5
DE 1086	Dec. 17, 1971	6
DE 1087	Feb. 4, 1972	7
DE 1088	Mar. 24, 1972	7
DE 1089	May 12, 1972	8
DE 1090	June 30, 1972	8
DE 1091	Aug. 11, 1972	9
DE 1092	Sept. 22, 1972	9
DE 1093	Nov. 3, 1972	10
DE 1094	Dec. 8, 1972	10
DE 1095	Jan. 12, 1973	10
DE 1096	Feb. 16, 1973	10
DE 1097	Mar. 23, 1973	10

[1] Delivered.

Chairman PROXMIRE. Are you familiar with the fact that the Todd Shipyard Corp. hired Adm. LeRoy V. Hunsinger as manager of shipbuilding when he retired from the Navy, and that one of Admiral Hunsinger's jobs prior to his retirement was Deputy and Assistant Chief of the Bureau of Ships?

Mr. RULE. Is that Admiral Hunsinger?

Chairman PROXMIRE. Yes, sir.

Mr. RULE. And he was a damned good one, too.

Chairman PROXMIRE. Are you also familiar with the fact that the attorney representing Todd on its claims against the Navy is Trowbridge vom Baur?

Mr. RULE. Yes, sir; and a very good attorney.

Chairman PROXMIRE. Are you aware that the same attorney also represents the Avondale and Lockheed Shipyards in their claims against the Navy?

Mr. RULE. Unfortunately.

Chairman PROXMIRE. Is it your understanding that Mr. vom Baur is a former Chief Counsel for the Navy Department?

Mr. RULE. Yes, sir.

Chairman PROXMIRE. Do you have any observations on how prevalent the practice is within the shipbuilding industry to hire retired military officers and civilian officials whose jobs in the Navy dealt with procurement?

Mr. RULE. In terms of what, Senator, numbers of bodies or——

Chairman PROXMIRE. Well, as you know, I asked——

Mr. RULE. Did you confine that question to shipyards or were you talking——

Chariman PROXMIRE. The shipbuilding industry.

Mr. RULE. Shipbuilding industry.

Chairman PROXMIRE. Yes, sir.

Mr. RULE. As distinguished from all industry?

Chairman PROXMIRE. Well, we want to know how prevalent the practice is. In all industries we found there was a three-fold increase in the last 10 years in the hiring of military personnel. Senator Douglas asked for the number who were hired of naval captains and Army colonels and above, and procurement officials in 1959, and found there were over 700 by the 100 top contractors in the country, and I asked for a similar list this past year and found there were three times as many, not 700 but over 2,000, and I am wondering if this is particularly prevalent in the shipbuilding industry or if it is about the same.

Mr. RULE. In my best judgment, in answering that question, it is not as prevalent in the shipbuilding industry as it may be in other fields of the defense activity.

Chairman PROXMIRE. Well, let me see. Do you think this is a problem here? Does this practice contribute to a healthy relationship within the Navy and shipbuilders from the standpoint of the American taxpayer who expects decisions about weapons systems will be based upon military need and efficiency and not favoritism or old school tie?

Mr. RULE. Well, as you probably know, I have strong feelings about military people, whether they be Army, Navy or Air Force, termin-

ating their service careers one day and going to work for contractors the next with whom they have—especially those with whom they have had relations while in their jobs. I have very strong feelings about that.

Chairman PROXMIRE. You think this is wrong and this can be——

Mr. RULE. Should be prohibited.

Chairman PROXMIRE. It is a clear conflict of interest that should be prohibited?

Mr. RULE. It should be prohibited.

LEGAL FEES ON SHIPBUILDING CLAIMS

Chairman PROXMIRE. Do you have any idea what the legal fees are on shipbuilding claims? For example, how much would Trowbridge vom Baur have collected on the $96 million claim paid to Todd?

Mr. RULE. I do not know. It had occurred to me to ask the audit people at Seattle to look at the company's books to see how much they did pay, but I have never done it.

Chairman PROXMIRE. Well, do you have any ideas in general, without specifying any particular firm, is there any general rule?

Mr. RULE. Well, sir; in this new job I have, chairing this special claims group, I am making it a practice to ask "Is your counsel in this case regularly retained by you or was he retained to get up this claim? If he was retained to get up the claim, how much are you paying him? Are you paying him a flat retainer or are you paying him a percentage of whatever is recovered by the company from the Government?"

I am asking these questions because I really want to know. I have in mind the restrictions that you put on up here in Congress, and rightly so, on these private claims bills where you put, the last paragraph says, that not over x percent of this can be paid to anybody helping to present this claim. I have in mind that sort of restriction.

I am told in one case where I asked this question about vom Baur, I asked what the retainer relationship was, and they are getting a flat agreed-upon retainer.

Then there was added the statement, "But we agreed after the settlement of the claim to sit down and talk about it."

Chairman PROXMIRE. It is a contingency arrangement?

Mr. RULE. Well, the answer to my question, that is what I was trying to get at, was it a contingency arrangement, and the answer was that it was not a contingency arrangement, there was a straight retainer, but "we would sit down and talk about it later."

Chairman PROXMIRE. Can you get the Todd legal fee paid to Trowbridge vom Baur for us and any other legal fees that were paid in this case for the record?

Mr. RULE. I guess I could, Senator, but I do not think I will to put it in the public record. I do not see that that helps anything.

Chairman PROXMIRE. Well, one of the problems that you brought up in your initial remarks is you have got these Washington law firms that are going to town on this new claim business and initiating all kinds of claims. I think the public has a right to know the extent to which they are enriching themselves, the extent to which they are making money out of it. It may be perfectly legitimate and proper. I

think everybody ought to have his day in court and ought to have the most competent lawyer he can get, but I think the taxpayers ought to know what legal fees are going to the top legal talent. I do not see any reason for keeping this secret. It certainly is not classified—there is certainly nothing classified about it. It is not going to help the Communists to know about this, and I do not know why it should not be in the public record.

Mr. RULE. I have enough to do without worrying about the Communists.

Chairman PROXMIRE. What I am trying to get at is, we have properly classified much of our military information because anything that could be of value to a potential enemy we do not want to disclose.

Mr. RULE. I understand.

Chairman PROXMIRE. This is nothing that has any relationship to that.

Mr. RULE. I quite agree.

Chairman PROXMIRE. It is something paid out of taxpayers' funds, and I think there is every reason why the taxpayer should have a right to know how much a law firm gets out of this kind of settlement when, as you say, this is a growing problem, and it is a problem which undoubtedly is becoming peculiar not only to the Navy but to the other services.

Mr. RULE. Well, sir; my only reservation is before I will say yes I will get that I want to talk over the propriety of making such a promise with my office of General Counsel in the Navy.

Chairman PROXMIRE. I understand that perfectly.

Mr. RULE. And I will take it up with them and—if they advise me they have no objection I will get it.

Chairman PROXMIRE. Well, I do hope we can get that.

(The information follows:)

At the request of the Office of the General Counsel, Department of the Navy, Mr. vom Baur furnished the attached statement with respect to the amount of legal fees paid his firm by Todd Shipyards for "legal work in connection with its shipbuilding claims filed with the Navy and which were settled earlier this year". The fees have not been broken down specifically with respect to the above described settlement but indicate a total amount of $139,711.00 for the years 1968 and 1969.

Mr. vom Baur is aware that this information was being obtained for the Subcommittee.

LETTER FROM F. TROWBRIDGE VOM BAUR

VOM BAUR, COBURN, SIMMONS & TURTLE,
Washington, D.C., December 31, 1969.

Re Todd Shipyards Corporation.

ALBERT H. STEIN, ESQUIRE,
Deputy General Counsel of the Navy,
Room 2034, Main Navy,
Washington, D.C.

DEAR MR. STEIN: This is in reply to your telephone request of this morning for "the amount of the fee" paid to us by Todd Shipyards for our legal work in connection with its shipbuilding claims filed with the Navy and which were settled earlier this year.

We started to represent that Company in 1968 and we still represent Todd. The total amount of legal fees which were paid to our firm by Todd for the two years, 1968 and 1969, aggregate $139,711.

Sincerely,

F. TROWBRIDGE VOM BAUR.

Mr. RULE. I would like to say one thing about Mr. vom Baur, who is making a success of these claims.

Mr. vom Baur, under date of November 25, 1968, wrote to Admiral Galantin, a nine page, single spaced letter and called attention to the fact that he was formerly the head of the office of general counsel, and he said, "I am making a lot of money out of the mistakes you people were making," and he is telling us in this piece of paper exactly what we are doing wrong and what we ought to change and how we ought to correct these.

Chairman PROXMIRE. Can we have that letter for the record?

Mr. RULE. Yes, sir. I thought in all fairness you ought to have that. And he sets out just what we ought to change, and he says, "If you don't it only means I am going to make more money."

Chairman PROXMIRE. He sounds like an admirable citizen.

Mr. RULE. He is.

Chairman PROXMIRE. I do not mean to criticize him in any way. I do not see how he would be adversely affected by the knowledge that he is making money out of this. He says he is, but how much he is making, the extent to which he is making it out of this particular contract, is something I think ought to be in the public record.

Mr. RULE. Well, I am a lawyer and I have practiced law. Then you get to the question of, is this an unconscionable fee or an unreasonable fee and that sort of thing, and honest men can differ on that sort of thing.

(The letter follows:)

VOM BAUR, COBURN, SIMMONS & TURTLE,
Washington, D.C., November 25, 1968.

Adm. I. J. GALANTIN,
Chief of Naval Material Headquarters,
Naval Material Command,
Washington, D.C.

DEAR ADMIRAL GALANTIN: I served as General Counsel of the Navy Department in the Eisenhower Administration, and now represent several Shipyards, among other clients, who do business with the Navy. Hence, I have come to know of the letter which you sent to some of the yards, asking for comments as to why the costs of ship construction have increased so greatly over the original contract prices.

I am not really sure that this is any of my business, directly. But with my strong sentimental attachment for the Navy, and some knowledge of shipbuilding, I thought I would try to put in my two cents' worth on this subject, if that should be acceptable to you. In addition, the subject is one with which I have had a fair amount of experience. For a good part of our practice consists of the preparation of claims for various Shipyards covering just such costs as are mentioned in your letter.

However, it has been a long time since I served in the Navy. I may well be in error in what I am about to say. I am ignorant of many of the Navy's present practices and methods. It may be that what I question in this letter has already been remedied; that other methods and solutions are being followed; or that my information is wrong. In any event, what follows contains the best suggestions I have.

In general, I don't believe many people outside the shipbuilding business realize how difficult it is for shipbuilders to try to prepare claims. A ship is still the largest item of hardware that the world produces; and a warship is enormously complex. And with the increase, over the last 10 years or so, of the issuance of Constructive Change Orders which places on the Shipbuilder what I call the "terrible problem of identification" of acts of the Government which may entitle him to equitable adjustments, some shipyards have simply found the problem

of identifying Constructive Change Orders, and preparing claims which are inherently complex, a problem of almost staggering magnitude. This has put some of the yards under heavy pressure to make certain that they try to collect all that they are entitled to under every Formal and Constructive Change Order. Moreover, there appear to be some shipyards which do not fully appear to realize what has hit them, and are suffering serious financial losses.

Please note that when I use the word "claims" in this letter, I refer primarily to claims under the "Changes" clause which entitle the shipbuilder to equitable adjustments in the contract price. This includes both Formal and Constructive Change Orders.

In any event, here are my more detailed comments:

1. *The Change in Method of Ship Procurement:* In the old days, ship procurement was usually effected by Negotiation, with the work largely divided up among various yards to keep them going. In those days, it was felt to be useful to have shipyards in being in the event of war. Now I don't believe this is any longer considered to be important at high levels in the Pentagon. In any event, ship procurement now is almost entirely effected by Formal Advertising. This means that every Shipbuilder has to ruggedly cut his bid down to the absolute, bare-bone minimum. If he is a penny high on a 100 million dollar IFB, he gets nothing. Thus, his bid can contain no contingency—nothing whatever—to compensate him for claims for increased costs which arise from acts of the Government which occur during performance.

This, in turn, means that Shipbuilders now have to develop, prepare, present and collect on, not some, but substantially all of the claims if they are going to make a profit, indeed to stay in business. Moreover, an understanding of the need for collecting on claims in order to stay in business, is something which has crept up on Shipbuilders only gradually. It has only come about over the last eight years as a slowly-dawning and disagreeable realization—usually as a result of losses and trouble. The overall result of this is that some Shipbuilders now have found that they have to present and collect on far more claims than they ever did before, in order to stay in business. Hence, the Navy is now receiving a greater number of claims as a result of the change in method of ship procurement.

2. *The Increasing Complexity of Shipboard Hardware*: The second reason for the increasing quantity of claims is that shipboard hardware has become immensely more complicated. Today it contains far more problems, bugs, and deficiencies than it did ten or fifteen years ago. In turn, these deficiencies generate claims—for Change Orders, delayed and defective GFP, suspensions of work, etc. Thus, this new complexity of hardware, all by itself, has been responsible for generating a considerably larger variety and quantity of claims than was the case ten to fifteen years ago. In addition, some of this shipboard hardware has been put together very hastily. I realize there are good reasons for this, in the interests of national defense. But, it can be a very expensive business, and in the end, I think the Navy has to pay for it. Perhaps one case illustrating this is *New York Shipbuilding Corp.* ASBCA 10819, 67–1 BCA ¶ 6242. In the interests of national defense, it was essential to put guided missiles aboard destroyers on a crash basis. But it portrays the very expensive results of putting the Tartar Missile aboard the DDG's in a terrible hurry, and without a prototype having been made in advance. As a result, the deficiencies in the missile system—Government Furnished Property—were required by the Navy to be worked out by the Shipbuilder during the process of ship construction; and this proved to be very expensive.

3. *Poor Specifications:* The third reason for the increase in claims is the increase in poor specifications. This subject is directly related to the complexity of equipment described in 2 above. However, it is one which appears to me to be within the Navy's control, so that, if I am right about it, it is perhaps a subject that the Navy can do something about.

As I see the problem, it is one of preparing good specifications. Today, I don't believe that specification writing in the Navy, or indeed in the Government generally, receives the attention it deserves. It is treated as an orphan stepchild. Few people at high levels have any real interest in it. But the specifications are not only part of every contract. They are of crucial legal significance. They establish an enormous bundle of legal rights and obligations; and they govern who has to pay for hundreds of millions of dollars of ship construction work. Accordingly, from the lawyer's standpoint, they are often the most important

parts of shipbuilding contracts, in a practical sense. Indeed, there appears to be far more litigation over the legal effect of specification language, than over boilerplate language, in the current decisions of the Armed Service Board of Contract Appeals.

Unfortunately, however, I think there is a general feeling in the Department of Defense that writing specifications is not only not of much general importance, but, in addition, that it is not even lawyer's work. True, lawyers litigate the meaning of specifications. But in the Department of Defense they do not appear to prepare them, to supervise their preparation, or even to participate in that process. As a result, there appears to be little overall supervision of any kind given to specification preparation in Department of Defense. Specifications appear to grow, much like Topsy, with a crucial word being changed here, a critical figure being changed there, and a new key phrase inserted somewhere else, sometimes by different people, often with a strong desire to upgrade the quality of the hardware, and without any organized concern for the legal consequences of the particular new word or phrase, or the over all integrated impact of a group of changes. Moreover, an engineer, with a strong desire to upgrade the quality of the hardware, will often insert a crucial word or figure thinking that only the Shipbuilder will have to worry about coping with it. But the unpleasant part is that, if this change renders the specification inconsistent with other parts, or defective, or impossible to perform within the time and other parameters of the contract—the Navy has to pay for the expensive results.

Thus, if I am right about this, the preparation of Navy specifications is at present a very haphazard process, whose consequences are not thought out in advance. And the results are very expensive for the Navy. For, as indicated, when the specifications prove to be defective, inconsistent, or impossible to perform, the Shipbuilder is entitled to recover from the Navy his costs of endeavoring to cope with them. In addition, ship delivery may be delayed for months or even years, as a result.

Accordingly, I would respectfully like to suggest that consideration in the Navy perhaps be given to improving the quality of specification preparation. When I was General Counsel, we had a similar problem in the Bureau of Yards and Docks. There, through our Bureau Counsel, Harold Gold, a Specification Writing School was set up. The lawyers acted as instructors; and I have reason to believe that this resulted in a general improvement of the quality of land construction specifications, and thus in fewer lawsuits, and finally, perhaps, in substantial savings of money to the Government.

This could be done on a broader scale. Specifically, a Navy-wide Specification Writing School, perhaps with a branch set up in each Command, with overall general coordination, and with the assistance of the office of General Counsel, could perhaps be possible. In addition, within each Command, perhaps a permanent Specification Review Board could be set up which would pass overall judgment on all changes in specifications. In this way, suggested changes, which now often creep in inconspicuously but often with far-reaching and expensive results, could be carefully analyzed and weighed, in advance of setting them into the specifications. In addition, their anticipated results on costs of construction and delays in ship delivery could be thoughtfully analyzed and forecast before a final decision to insert a new but turbulent word or figure in the specifications, would be made. Also, suggested changes could be balanced against each other for consistency and compatibility, and for the overall objectives sought, in relation to expense, delay in ship delivery, and possible problems. If anything like this should ever be done, I would like to suggest that the office of the General Counsel be represented on such a Review Board. Otherwise, I would like to suggest that the other members include highly qualified engineers, and high level management people. So much money is involved, along with the crucial subject of delay in ship delivery, that this is a subject, in my judgment, of major importance, for high level attention.

In summary on this point, at the present time my practice indicates that the Navy does not really know, in advance, what problems its specifications are going to plunge the Navy into—what difficulties the Shipbuilder is going to run into, what his increased costs will be, what astronomical sums the Navy itself will eventually have to pay, and how long ship delivery may be delayed. But I do think that these problems can be thought out in advance, to some extent at least; and if they are thought out in advance, even to some extent,

I have no doubt that the results in savings to the Navy would run to very large sums of money; and that there would be fewer delays in ship delivery. There are a number of examples which come to mind; but since they relate to problems of clients, I do not think it would be appropriate to mention them in writing. However, the decisions of the Armed Services Board of Contract Appeals now contain a steadily increasing number of decisions involving poor or defective specifications.

To be facetious for a moment, there is perhaps only one compensating feature of all this, which is that when the Navy issues poor specifications, a lot of work for lawyers is generated.

4. *Inadequate Staffing, Recognition and Compensation of People in the Business Side of the Navy:* Here, if you will forgive me, I come to an old tune which I have played consistently and even somewhat loudly since I was in the Navy as General Counsel. In a nutshell, this tune is that the people in the business side of the Navy, military and civilians, and particularly the civilians, appear to me to be inadequately staffed, inadequately recognized and inadequately paid, in comparison with other Naval activities. The real beam of the spotlight is on the Naval Officers who fill the high ranking jobs, command the ships and fly the planes. I have no criticism of this. What troubles me is that there is a wholly disproportionate lack of staffing, recognition and pay accorded to those in the business side of the Navy where contracts and specifications are written and administered. In the broad spectrum of the Navy, I have come to have the strong feeling that these people are treated like poor relations. In many Naval quarters, contract work often seemed to be considered second class work in my time, or at least not something worthy of much interest by high ranking Navy officials. In addition, the turnover among military personnel in contract work, where knowledge and experience are of such vast importance, is much too high.

May I set forth what I consider to be the reason for this? In recent years, the importance of Navy hardware has gone up steeply in relation to the people who man the ships, so that the people who buy and handle the hardware have become correspondingly more important than they were 150 years ago. When the *Constitution* was built in the 1790's, shipbuilding was an essentially simple process, in relation to problems of crewing and fighting the ship. But, this is no longer true. Now the proportion of hardware to personnel has risen steeply, if not astronomically, and it has vastly increased in complexity. Now each crew member handles, one way or another, strikingly expensive items. And this hardware costs the taxpayers hundreds of millions of dollars. Yet, the budget is unbalanced. Taxes are high; and I think economy in these expenditures is a desirable objective.

Frankly, however, I don't think shipbuilding costs can be lowered to their economic potential, until there is better staffing, recognition, and compensation, of people in the business side of the Navy. From my practice, I see many expensive nuts and bolts which result from what I consider to be the present understaffing, lack of recognition and inadequacy of compensation. Poor specifications are one example. Also, there are many failures by Navy personnel to answer Shipyard letters which result in expensive trouble; errors which cause tremendous delays and confusion in the delivery of Government-furnished property; and errors which result in the furnishing of unsuitable GFP. These are errors which are very expensive for the shipbuilder, and eventually for the Navy, but which I think the Navy could minimize if it had sufficient capable personnel to cope with these problems as they arose, and to think them out in advance. Also, there is a lack of coordination among lead and follow yards for which the Navy is responsible, which also has expensive consequences. In my opinion, these deficiencies could also be fairly readily solved by the addition of enough qualified personnel who could think the problems out as they arise.

In addition, many Navy personnel have never been adequately educated concerning Constructive Change Orders. Many Navy officers think, literally, that they can direct a Shipbuilder to do anything that seems like a good idea at the time; and they are greatly surprised when they learn that they have been issuing expensive Constructive Change Orders. Indeed, I have seen this happen many times. But, these things would not happen if Contracting Officers and Negotiators and Supervisors of Shipbuilding, and their staffs, were not overworked, inadequately recognized and underpaid. Yet, literally, there are hundreds of millions of dollars flowing through their hands. These bare facts alone seem to

speak to me, compellingly, for themselves. And, in my judgment, there is no real hope of true economy in the complex business of shipbuilding until these people are less overworked, better recognized and better paid. My experience indicates with very considerable force and drama that there is the most direct relationship between the competence of Navy contract personnel, and economy in shipbuilding costs. And the small additional sums which better staffing, recognition, and pay for these people would cost the Navy, are peanuts compared to what the resulting savings in the cost of shipbulding would be.

I am afraid I have had to write this letter more hastily than the importance of the subject matter warrants. But if I can be of any assistance to you, I hope you will call on me; and may I wish you the best of luck with this problem, and in your very important job.

Sincerely,

F. TROWBRIDGE VOM BAUR.

Chairman PROXMIRE. We would also like to know the extent to which—this may be contingent, you said these fees are not contingent, but it is the matter of sitting down and talking this over.

Mr. RULE. That is what I want to know.

Chairman PROXMIRE. Of course, the larger the claim the larger the fee if it is contingent.

Mr. RULE. That is right.

Chairman PROXMIRE. And this may be another element in persuading lawyers to persuade their shipbuilding clients to make the biggest possible claim.

Mr. RULE. That is right, sir.

Chairman PROXMIRE. For the biggest possible fee.

Mr. RULE. That is right.

When I was practicing law I had claims against the Government that I prosecuted, but I always made it a point to have a flat sum depending upon how many hours I thought that claim would take. I would figure it out and I would charge so much an hour, and that would be my fee win, lose, or draw, and I was always in a position where I wanted to be in, to say to the people that I was dealing with and negotiating with, "I am not getting $1 of this as a contingency, so when I argue with you on the merits of this claim, I am not getting any money out of it."

Now, when you do that you lose money sometimes because it takes you more hours. But other times it takes you less hours, and you make money. But I think that is the sort of an arrangement an attorney should have dealing with the Government on claims.

Chairman PROXMIRE. I certainly agree.

Let me return just for a minute, as we conclude here, to a broader discussion of the future of Navy procurement and the possible solutions for the problems that have been identified, you have been identifying for us.

I would be grateful if you could again summarize for us briefly where you think the solutions lie, what we can best do to meet the problem of waste and enormous cost as you have testified.

NEED FOR CIVILIAN CONTROL OF PROCUREMENT

Mr. RULE. Well, Senator, I have thought a lot about this, and we use the term "waste and inefficiency" pretty—I started to say cavalierly—but loosely, and we do not always define it.

In the Navy I see waste and, perhaps, inefficiency just in organizational structures, just how we are organized in procurement.

I see waste by the military spending the procurement dollar. I really think that we would save money if civilians took over the spending of the money. The military are, unless you want to refer to some very able Supply Corps officers, the line officers are not trained in this. It is not their forte, and I think that, for the long term, I think it will come to the point where the civilians, capable civilians, will take over the spending of this money, and I think it will be better spent if for no other reason than to come back to what I said at the outset they will be able to challenge.

Today I know of mistakes that we make that cost us a lot of money, and you will have a project officer, who is an officer, a Navy officer or a Marine officer, he knows that what we want to do or what is going to be done is wrong, he will say it is wrong, and his superior will say, "Knock it off, we are going to do it anyhow."

The answer is, "Aye, aye, sir."

Now, that goes on up and gets perpetuated. Civilians could challenge that all the way to the top.

But when you get enmeshed in this "Aye, aye, sir," with respect to spending the dollars, it gets pretty rugged, and this is another area that I am hopeful the Holifield Commission will look into.

Chairman PROXMIRE. This is most encouraging, a most encouraging kind of response, because there is not any question but what you have put your finger on one of the great weaknesses. It is not a matter of corruption—very little of that, I am sure. It is not really a matter of incompetence because these are able people and thoughtful people, but it is a matter of having the wrong agency doing this, doing these procurements, as you say. But you have a matter of discipline, you have a matter of great emphasis on mission, you have a disregard, and an understandable disregard, for costs, and putting the necessity for going ahead with the mission in a cost perspective.

As I understand it, England and Canada have both separated their procurement from the military and, after all, there is nothing military about a procurement process. It does not require, in fact, the military have some weaknesses in regard to procurement practices which you have indicated here, and I think that the implication of your suggestion that this is something that we might consider, the Holifield Commission and others may consider, as an alternative, is most constructive.

Mr. RULE. Well, sir, you see, it goes a little deeper than that. If the military are going to stay in this act, and if the heads of all the contract divisions in the Navy and various Syscoms in the Navy are all captains and four stripers and they are under a lot of admirals, they do not stand up when they have not yet been selected, when they have not come up for promotion, when they are told to do something by the admiral, their finger is right on their number, and I do not think the system ought to be that way. They ought to be able if they are going to be military people, they ought to be able to challenge. But human nature being what it is, most of these people, most of these high ranking, able naval officers, want one of two things: they want to get promoted to admiral or they want to get a good job in industry.

Chairman PROXMIRE. Exactly; and both those elements enter in here when you have the military doing these procurements.

You have, No. 1, the recognition if they are going to be promoted in the military, those promotions are hard to get and they are limited, and then they have to have the approval of their military superior. They are based on playing ball, not challenging waste when such a challenge could be embarrassing.

Mr. RULE. They mark their fitness reports.

Chairman PROXMIRE. At the same time, we have a peculiar retirement system, many good and bad characteristics of it. These men can retire at a relatively early age and still have a great number of years ahead of them. They can retire at full pay at 48 or 50 or 52 and in the prime of life, and go into private business, and the business they go into logically is the one they have been associated with and working on.

But both of these factors would militate against a really efficient procurement operation free of conflict of interest.

Mr. RULE. Well, sir, these things bother me from the point of view of just plain organization, and I do think that organization is a part and can be looked upon as a part of waste and inefficiency.

Chairman PROXMIRE. Would you propose consideration of a ministry of technology such as Britain has, where an independent civilian agency does the procurement after the miltary provide their recommendation as to specifications?

Mr. RULE. Well, I have already said that I hoped and would recommend that in this country in the future we get to the point in our Department of Defense procurement where it is a civilian group. Whether it should be patterned after the English I do not know, but I do recommend that we have a separate civilian procuring activity for all of DOD, all three of the services.

Chairman PROXMIRE. Mr. Rule, thank you very, very much. I think we started as partners and we conclude as partners. Your testimony has been responsive and forthright and most enlightening and useful. We thank you very much.

Mr. RULE. Happy New Year.

Chairman PROXMIRE. Happy New Year. I hope whatever good words I have said about you do not get you into trouble.

Mr. RULE. Don't worry about that. As long—one thing you have to be, I think, in this business is about 96 percent right. You cannot be 100 percent, but if you are 96 percent right I think your superiors recognize it, and won't tell you, but I think, perhaps, they even like it a little.

Chairman PROXMIRE. Well, that is most encouraging, and I hope that assessment is correct.

Mr. RULE. I have just one suggestion for you, sir.

Chairman PROXMIRE. Yes, sir?

Mr. RULE. You get a great many headlines criticizing the Navy and criticizing DOD. I would appreciate it if you would look around some time and see if you do not find something that you like, something that we do right, because we really do, and I would like for you to get some headlines publicizing some of the things we do right.

Chairman PROXMIRE. Mr. Rule, you have been around Washington a long time.

Mr. RULE. We are still partners.

Chairman PROXMIRE. You know when you see something right and say it is right it is not news. I have said many good things about the Navy. There are many good things. I have praised Admiral Rickover, I have been for expanding nuclear propulsion.

Mr. RULE. Why don't you find somebody else?

Chairman PROXMIRE. What was that?

Mr. RULE. Why don't you find somebody else that is—there is at least one other person around as good as he is.

Chairman PROXMIRE. Gordon Rule, I said that this morning.

Mr. RULE. It took a long time for you to state it. [Laughter.]

Chairman PROXMIRE. Thank you very much.

We will return tomorrow morning at 10 o'clock to hear Assistant Secretary of the Navy Frank P. Sanders, installations and logistics, in this room.

The subcommittee will stand in recess until that time.

Mr. RULE. Thank you.

(Whereupon, at 12:05 p.m., the subcommittee was recessed, to reconvene tomorrow, Wednesday, December 31, 1969, at 10 a.m.)

THE ACQUISITION OF WEAPONS SYSTEMS

WEDNESDAY, DECEMBER 31, 1969

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

The Subcommittee on Economy in Government met, pursuant to recess, at 10 a.m., in room G-308, New Senate Office Building, Hon. William Proxmire (chairman of the subcommittee) presiding.

Present: Senator Proxmire.

Also present: Richard Kaufman, economist, and Douglas C. Frechtling, economist for the minority.

OPENING STATEMENT BY THE CHAIRMAN

Chairman PROXMIRE. The subcommittee will come to order.

This is the third and final day of our current round of hearings on the weapons acquisition process. It is also, of course, the last day of the year, and it is a good time to look back and see what this subcommittee has recommended and what has been accomplished so far.

In our May 1969 report, "The Economics of Military Procurement," the subcommittee made a series of recommendations based on our hearings. These were designed to improve the understanding of the Congress and the public of military procurement. This was a controversial report, highly critical of Defense Department policies and practices, and based in part on our investigation of the C-5A program and its enormous $2 billion overrun. It stimulated a great deal of comment, much of it, especially from the Pentagon, critical and hostile. At the time the recommendations were issued, not many were optimistic about the chances of getting them put into effect. Let us see what happened to them.

We recommended that the GAO makes a comprehensive study of defense profits. No such study had ever been made and, frankly, it was felt that there was little likelihood that any would be made prior to our report. Based on this recommendation, I introduced an amendment to the military authorization bill calling for just such a study. It passed unanimously and survived the conference in a somewhat revised form.

The GAO has now undertaken to perform such a study and we look forward to its completion by the end of 1970.

We recommended that a feasibility study of the "should cost" method of analyzing contractor efficiency be conducted.

The GAO has begun a feasibility study and its interim report on

this study on Monday was most encouraging. We expect that report to be completed early in 1970.

The subcommittee recommended that a Defense-industrial personnel exchange directory be compiled to record the number and places of employment of retired or former military and civilian Defense Department personnel currently employed by Defense contractors, and the number and positions held by former Defense contractor employees currently employed by the Pentagon.

Based on this recommendation and the material I had received from the Pentagon that there were some 2,100 high-ranking retired military officers of the rank of colonel or Navy captain and above in the employment of the 100 largest Defense contractors, I drew up an amendment to the military authorization bill calling for the preparation of such a list, requiring that it be available to the press and the public, and that an annual report to the Congress giving its details in an organized form be made by company.

That, too, passed unanimously and survived the conference. Incidentally, it also calls for information on those high Defense officials who have come into the Department directly from jobs with the big contractors.

This directory is in the process of being compiled by the Department of Defense and we look forward to its release on an annual basis in the near future.

Perhaps of greatest importance, we recommended that a weapons acquisition status report be developed and made available to the Congress on a periodic basis. Up to now, there has been no way for an individual Member of the Congress—for that matter, for the general public and the taxpayer—to know the status of any particular weapons program, to know whether it is costing more than was originally planned, to know whether it is being produced according to the schedule, or to know whether its performance is satisfactory.

On Monday, the GAO reported to this subcommittee the work it has performed so far to develop this kind of an information system. Its report consisted of a review of the data being supplied at the present time by the Pentagon. The GAO was highly critical of the Pentagon's data and pointed out the inadequacies and gaps in what the Pentagon is supplying to the Congress.

It is my hope that the GAO will continue in its present effort by making its own reviews of each of the major weapons systems and that it will make the results of its study available to the Congress on an unclassified basis early in 1970.

Certainly, information systems do not cure problems and will not solve the defects in our present procurement program. However, the information we are now getting and which we will be getting next year represents a great leap forward in the status of our knowledge and it will help us to identify problems and to recommend corrective action.

For example, the information collected so far indicates that some of the most serious cost overruns, schedule slippages, and performance failures are occurring in Navy weapons systems.

Fifty percent of the cost overruns that have been identified so far throughout the Pentagon are in Navy programs. Of the $21 billion in cost overruns $10.7 billion are attributed to Navy programs.

Further, in my estimation, these are very conservative estimates. We have pointed out in the past 2 days a number of places where cost overruns do not show up in the figures that have been supplied by the Defense Department. In the DE–1052 destroyer program the Navy figures show only a $1 million increase since 1964. But under questioning, the GAO conceded that there was at least a $300 million overrun in this program.

In the Poseidon program, about which we want to ask you in some detail this morning, Mr. Sanders, a $1.3 billion cost overrun is reported but the Navy has not supplied a planning estimate and the question is whether the overrun is considerably higher than what has so far been reported.

Today I hope we will begin to answer some of these questions as we hear from our final witness, the Honorable Frank P. Sanders, Assistant Secretary of the Navy for Installations and Logistics.

Mr. Sanders, you have earned a very good reputation up here on the Hill working in the House Appropriations Committee; and Secretary Laird who, I think, was one of the ablest Congressmen—he comes from my State, he is in the other party, but I know how able a man he is—made a fine decision when he chose to take you with him to the Defense Department and give you this very big and important responsibility.

You do have some of the very same kind of advantages from the experience that Congressman Laird has had, having studied this problem from this side of the table, and I think that you are able to bring us a great deal of understanding and knowledge because of the many years you spent up here.

Nevertheless, I must say that I am deeply disappointed in your statement. I know you worked hard on it, and it undoubtedly has some material in it that might be of interest and use to people academically. But you talk about milestone management, development concept papers, Defense system acquisition review, advanced procurement plans, and so forth. You constantly talk about how you are working hard to develop a system which will achieve the result of reducing costs and eliminating waste. But it reminds me of the story of the man who went to get a shave. He got into the barber's chair and the barber lathered him and told him a story, and lathered him some more and told him a story, and after the fourth or fifth story the man said, "When are you going to shave me?" And the barber said "I don't shave! I just lather."

I think you have got a lot of lather here, but there is no cutting edge, there is no razor.

So I would appreciate it if we could very briefly summarize this statement, put the entire statement in the record, and then go to the questions because we would like to get into some specific questions here and problems.

Incidentally, I would like to say that the Navy has been highly responsive in reply to the letters we have sent to you in specific areas. You have been most helpful to us, more than some of the other services have.

One more point with regard to this statement this morning: in the letter that was sent to you outlining what kind of a statement we wanted on December 10, I wrote you as follows:

"As Mr. Kaufman explained to Captain Ball, we will ask some questions about the Poseidon program as well as several other programs, including the destroyer escort 1052, the DSRV, the DSSV, the LHA and the attack aircraft carriers. However, I do not mean this short list to be all-inclusive but merely suggestive of the broad range of the shipbuilding activities that the committee is interested in. It is possible that questions about other programs will be raised."

We hoped that this letter would give you an understanding that we wanted a specific analysis of how these programs were progressing, where they were exceeding your cost estimates, and why, and what you were doing about these particular programs to get them under control.

So if you would briefly summarize your statement, then we will put the statement in the record, and I would like to proceed with some questions.

STATEMENT OF FRANK P. SANDERS, ASSISTANT SECRETARY OF THE NAVY (INSTALLATIONS AND LOGISTICS); ACCOMPANIED BY ROBERT A. FROSCH, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH AND DEVELOPMENT; REAR ADM. N. SONENSHEIN, COMMANDER, NAVAL SHIPS SYSTEMS; REAR ADM. LEVERING SMITH, DIRECTOR, STRATEGIC SYSTEMS PROJECTS; CAPT. R. G. FREEMAN, DEPUTY DIRECTOR, NAVAL MATERIAL COMMAND, PRODUCTION AND PROCUREMENT; CAPT. WARREN COBEAN, DEPUTY DIRECTOR, STRATEGIC SYSTEMS PROJECTS; AND CAPT. EDWIN E. McMORRIES, SPECIAL ASSISTANT TO THE SECRETARY OF THE NAVY (INSTALLATIONS AND LOGISTICS)

Mr. SANDERS. Senator, you are very kind in your remarks about me personally. I am deeply appreciative of them.

I must confess that this is my first appearance on this side of the table before a congressional committee. I would feel much more at home sitting where Dick Kaufman and your other staff members are sitting and working with you on this program.

When Senator Stennis questioned me on my confirmation he leveled his finger at me at the end of the table and said,

Young man, we have known you. You are going down there. You know the problems of Congress. We think you can help us in meeting these problems.

I hope I can. This is certainly my attitude here today, and has been my attitude, as you are aware, before in personal encounters.

I have always had the philosophy that a democracy is a team effort. The legislative and the executive branches including the General Accounting Office must work together as a team. So I frankly discuss these matters with you strictly in that type environment.

Before I proceed I would like to introduce the gentlemen who are here with me at the table this morning. We have attempted to bring the expertise available to answer your detailed questions.

On my right is Dr. Robert Frosch, who is Assistant Secretary of the Navy for Research and Development. At Dr. Frosch's right is Admiral Sonenshein, the new commander of the Naval Ship Systems Command; at Admiral Sonenshein's right is Captain Freeman, Deputy Chief of Naval Material for Production and Procurement.

On my left, as you are aware, is Adm. Levering Smith, Director of the Strategic Systems Project Office.

I must confess that I am disappointed at your reaction to the statement. In addition to your request for information on specific systems—I believe your letter asked for a discussion of the overall procurement policies and practices of the Navy. This is what I have done in my statement.

I have attempted to outline in the statement basically what we are doing in an effort to meet the overall problems. We are prepared to discuss, to the best of our ability, some of the specifics which you mentioned.

I appreciate your placing this statement in the record and I would like to briefly summarize it and highlight a couple of important areas to which you have referred, in particular the matter of program management, cost growth, and ship claims.

Chairman PROXMIRE. All right, sir. If you will refer to the pages as you skip through the statement it will be helpful.

Mr. SANDERS. All right, sir.

When you want to discuss Poseidon, Admiral Smith has a brief statement outlining the management concepts in that program with additional data, should you like to hear it, sir.

I have attempted to describe in the statement some of the actions taken by our superiors in the Secretary of Defense's office to control cost growth and the other problems.

Mr. Shillito has discussed these with you briefly. They refer to the development concept paper which, in effect, basically tells us where we should go and what we should do.

DEFENSE SYSTEMS ACQUISITION REVIEW COUNCIL (DSARC)

In the statement, I discuss the establishment of the new defense systems acquisition review council or, as we call it, DSARC. I do not believe this was discussed by Mr. Shillito, and I would like to call this to your attention because I think it is a very valuable tool for the objectives which you have announced that you are seeking.

Its membership includes the cognizant Assistant Secretaries of Defense, and the Director of Defense Research and Engineering. Its main purpose it to approve the transition of major acquisition progress through the decision point of initiation of contract definition, when such is to be utilized, then move into full scale development, and the most critical phase, the transition from development into production.

I have discussed, in the statement, the SAR reports to which you referred in your opening statement. I do not think it is necessary to discuss the advanced procurement planning program with you.

I would like to point out the business clearance with which you are familiar. I believe Mr. Rule, who is the director of this operation within the Navy, testified before the subcommittee yesterday.

I would like to mention one thing which, as far as shipbuilding is concerned, is far reaching in the area of program managers, sir.

In our review of program management it was found that responsibility had been spread over too broad a spectrum. The Navy has recently, under the guidance of Admiral Sonenshein, given much more authority and control to program managers. We are trying to develop the information and cost control systems which will help these managers function more effectively and efficiently.

For the first time this ship acquisition project manager has the responsibility and authority to manage all aspects of this program as a complete entity. We trust that this will go far toward meeting some of the problems in shipbuilding.

Cost "Growth"

Let me bounce over, if I might, to the section of the statement, sir, in speaking with reference to cost growth.

I do not need to mention to you that cost growth is not always avoidable. We have escalation; we have requirements frequently to upgrade military weapons systems, to achieve additional capability not required when they were first put on the drawing board.

Both of these, together with the change in market conditions existing because of Southeast Asia, have caused cost growth, but, as I state, there are other factors which are within the control of the Navy to correct. Many of them require improved program controls.

I would like to emphasize what we have sought to do in this respect. We have initiated a series of actions aimed toward overcoming some of these factors. We are continuing to build and improve a cost estimating capability within the Navy which can provide not only a better budgetary estimate but also a means of more accurately assessing the reasonableness of contractor proposals, thus fostering a basis for credibility with industry as well as with DOD and the Congress. I think this is probably one of the major areas where we must place additional emphasis.

We have improved configuration management, providing for better controls over changes, particularly during the production phase of a program.

We have increased emphasis on the selection and timely delivery of Government-furnished equipment to assure compatibility with contractor installation dates.

We have tried to identify fallback installations, particularly when the Government-furnished equipment represents equipment with advanced characteristics in the development stage.

We have placed increased emphasis on improving our ability to identify, analyze, and evaluate technical and cost risk areas.

We are attempting, wherever possible, to maintain competition through development well into the production cycle. This is to be applied when the technical challenge in great during development and/or when production quantities and consumption rates are of a sufficient magnitude in relation to the added costs for dual development to warrant this course.

As you are aware through previous testimony, we are utilizing performance specifications where practicable.

Shipbuilding Claims

The matter of ships claims is a matter of serious concern to the Navy.

Secretary Laird and Secretary Chaffee have both testified on this before a number of congressional committees. I refer to this in the statement, sir. This is one of the manifestations of cost growth and is of concern to the Navy, in particular, in the shipbuilding and conversion program.

I would like to emphasize that claims are not automatically accepted as valid but are carefully scrutinized for legitimacy. The Navy efforts to overcome this major area of concern fall into two areas. First of all, proper settlement of the claims on hand and, secondly, steps to overcome the number and magnitude of future claims.

To insure judicious and proper settlement, teams have been established for each major claim.

As you are aware, a new Control and Surveillance Office under the Chief of Naval Material has also been established. I know of your interest in focal points to which Congress can go for information. This new office for the first time will present a single focal point within the Navy where current information will be contained as to the status of major claims and from which coordinated advice will be given to the system commander regarding the handling of such claims.

We feel that reductions in future claims can be made by some of the changes and improvements outlined in this statement.

The considerations involved in the acquisition of our major systems are many faceted. We mention a few in this statement. It includes an examination of past contracting techniques, seeking methods which will hold down costs and reduce the number and magnitude of contractor claims, and at an early stage clearly identify the risk involved and take corrective steps.

I need not tell you that contracting for a complex major weapons system remains an elusive and not well-developed art. We are striving, to the best of our ability, for major improvements in this area.

Milestone Techniques

You referred to milestone techniques. I realize that, with your background, we do not need to discuss this today, but I would call to your attention that we have taken note of this in the statement which is before you.

We have included contractual milestones in the S–3 aircraft procurement program. As I stated in the statement, we have included them in the recently announced advanced surface missile system contracts. We are proposing to include them in our next major Navy shipbuilding contract for the DD–963.

I now turn to the next section of the statement, sir. There are other actions that have been taken, including attempting to get more development testing of high risk components and subsystems during concept formulation phase.

Prototype competition and parallel development are being required when risks can be significantly reduced, costs are acceptable, and funds can be identified to cover the additional costs.

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I would be remiss if I did not mention the next section of the statement to you personally, sir, because I feel very strongly about them, and I feet that you do also with reference to your use of your own staff.

Need for Aggressive and Intelligent Managers

While all of the improvements discussed today are important, the best management information and control systems in the world would be useless without aggressive and intelligent managers.

Good men, those with the necessary background experience and training, are hard to find and their talents are in heavy demand throughout the Navy.

The Navy has been carefully considering the actions necessary to assure not only the selection of our very best managers for our major programs, but also optimum rotation policies which will provide for adequate overlap of relieving project managers, and coverage during critical program phases.

We have embarked on an aggressive training program designed to provide more and better weapons systems acquisition managers and personnel. We feel that all of the efforts to improve the quality of our available managers and the tools with which to do the job will go a long way toward achieving successful acquisition programs.

I might point out, sir, that although short-range efforts are being made in this direction, and particularly with reference to the rotation, that this is definitely a continuing long-range problem which must be emphasized.

In conclusion, sir, the Navy is striving to achieve effective and economical acquisition of its weapons systems and supporting equipment. We believe that the intensive evaluation of the weapons systems acquisition process which the Department of Defense and the Navy are carrying out, will do a great deal to achieve this objective.

The goal of 100-percent effective economical and flawless acquisition of major systems is highly elusive. It may never be achieved. Yet it will remain, you may be assured, as our basic objective. To accomplish this goal we are doing our very best to review the lessons learned from past mistakes and to apply them to our future programs.

Thank you.

Chairman Proxmire. Thank you, Secretary Sanders, very much. Your entire statement will be printed in full in the record.

(The prepared statement of Mr. Sanders follows:)

PREPARED STATEMENT OF FRANK SANDERS

Mr. Chairman and members of the committee:

I appreciate your invitation to appear before you to discuss the Navy's weapons systems acquisition policies and procedures. You have indicated particular interest in our shipbuilding programs. To this end my statement will address our overall major systems acquisition policies and procedures with particular focus on shipbuilding. In recognition of the complexities, problems and difficulties associated and experienced in our acquisition efforts, I would like also to describe some of the changes we have made in organization, procedures and techniques as a result of lessons learned, which we believe will greatly assist us in our future efforts.

The Navy buys weapon systems for use in the air, on land, and in the sea. And while land and air systems represent demanding and complex procurement

problems, the most unique problems relate ot the procurement of ships. A ship is not one, but a series of interlocking weapon systems.

A destroyer is a good example. It has sensors—radar, sonar, etc. It has anti-submarine warfare weapons. It has missiles for air defense. And it has guns for naval gunfire support.

Finally, it has computers to give the crew the ability to effectively coordinate and manage these systems.

Because of its complexity, coordinating the procurement and construction of a ship is susceptible to numerous problems. One element or subelement falling behind schedule in its development may disrupt the schedule of the entire ship.

How Navy Manages Weapons Development

When Mr. Shillito, the Assistant Secretary of Defense (Installations and Logistics), appeared before this subcommittee in June of this year, he explained how the Department of Defense and the services manage the acquisition of a weapon system. You will recall that he explained the concept formulation and contract definition phases of a weapon acquisition and the six prerequisites to the contract definition phase. These prerequisites are that:

Primarily engineering rather than experimental effort is required, and the technology needed is sufficiently in hand. The mission and performance envelopes are defined. The best technical approaches have been selected. A thorough trade-off analysis has been made.

The cost effectiveness of a proposed item has been determined to be favorable in relationship to the cost effectiveness of competing items on a DOD-wide basis. Cost and schedule estimates are credible and acceptable.

He also explained how the development concept paper is used as a major tool by both the Department of Defense and the services during the development of a weapon system. The DCP is not a recent innovation and not one which provides us infallible clairvoyance in our future progress of a particular acquisition effort; however, it does represent an early effort to review and identify, at a high level, the scope of planned or desired performance requirements, program risks, decision and progressing milestones and estimates of program costs. The Navy views the approved DCP as our contract or agreement with the Secretary of Defense to pursue and achieve the established DCP objectives. DCP techniques provide a structure upon which our early program analytic efforts may be refined and adjusted to respond to the lessons learned from past and present program difficulties.

Of course, the DCP is not the only management control tool or technique. Each program is managed by milestone management plans which identify key progress measurement and decision points. We continually attempt to give increased high level visibility to critical points in the acquisition program. This has included the use of such milestones in our contracts as a means of improving our control over contract progress, as an incentive device and as a means of reducing the probability of contractual claims. I will refer again to this technique later in my statement.

As a further check on key milestone actions in our major programs, last May the Secretary of Defense established the Defense Systems Acquisition Review Council or DSARC. Its membership includes the cognizant Assistant Secretaries of Defense and the Director of Defense Research and Engineering. Its main purpose is to approve the transition of major acquisition progress through the critical milestones of initiation of contract definition when such is to be utilized, the move into full scale development, and perhaps the most critical phase, the transition from development into production. In addition, the Secretary of Defense has also established, under the immediate cognizance of the Director of Defense Research and Engineering, program management reviews which focus on the actual management of these major programs. Both of these reviews have not only proven valuable to the OSD but have added increased focus to the critical aspects involved in our attempts to successfully acquire major systems.

In order to obtain the information to progress program performance we are attempting to improve on our collection of meaningful information from contractors. We are now collecting data which provides trends, variances, financial status and comparison information to apply against planned milestones. In addition to its use by program managers it is also useful in program status reports designed for higher level review. We still have a long way to go in the develop-

ment of useful, precise and optimally economic information systems, which provide timely information and are readily compatible with the information requirements of all levels, including the Congress.

In this regard, as you know, we have recently developed the Selected Acquisition Reports or SAR, providing program status information on a quarterly basis much of which is the result of information collected from our contractors. The SAR has already proven a useful high level review document. However, like all new reporting systems, it needs refinement, including perhaps refinements which will permit the derivation of meaningful information within capabilities of contractors and military departments to supply meaningful information and meeting the requirements of managers and all review levels, including that of the Congress. During the evolution of major programs, other techniques are employed by the Navy to assure proper planning and execution of our major contractual actions. Two of our major controls are: our advanced procurement planning and the business clearance.

Advance Procurement Planning

The purpose of advanced procurement planning is to give early visibility to potential procurement problems before they become critical. It is a discipline to insure that procurement considerations are continually injected into program planning during concept formulation and contract definition. Of greater significance, appropriate use of the advance procurement plan in the early stages of weapons development, is a good vehicle to assure proper consideration is given to the optimum use of completion.

Advance Procurement Planning or APP is a team effort. While the project manager has the ultimate responsibility for the plan, he relies upon people from the engineering, production, and contracting disciplines to provide him with the expert advice he needs to make the basic procurement planning decisions.

The development of a sound advanced procurement plan is an essential step in a well organized, major acquisition effort. Advance Procurement Planning starts during concept formulation and the plan itself becomes a part of the technical development plan. The Advance Procurement Plan must provide a check list of planned procurement actions, complete with realistic milestones, which are aimed towards accomplishments of the final procurement objectives. The Plan will address itself to such things as the kinds and amounts of Government furnished equipment to be furnished the contractor. Recently, we have placed added emphasis on not only identifying the kinds of Government furnished equipment but also a careful review of the availability and scheduling of such equipment and assuring compatability with contractor installation schedules. We have become particularly sensitive to this need since we have readily found that late Government furnished equipment in our shipbuilding programs encourages contractor claims. We are giving this matter particularly careful attention and emphasis.

The Advance Procurement Plan also addresses the probable type of contract to be employed, evaluating the nature of the work, the extent of risks involved, the state of the art, and the extent of competition to be obtained.

The Plan must also be used to provide appropriate management levels with a means to review the procurement program—both initially and during the several phases of the development and production cycle. These reviews must address the major objectives of the acquisition process—that is, timely delivery of a product meeting the performance requirements and within a reasonable, predictable, and controlled cost.

In order to minimize risks, the need to effect competitive development must be fully considered. If competitive development is deemed necessary, consideration must be given to competitively develop components or complete prototype models. The use of such competitive parallel development is receiving increased attention as a means of reducing program risks. Ideally, the decision to pursue parallel competitive development must be reached at an early stage to provide budget inclusion for the additional cost normally associated with such effort.

Perhaps the most important aspect of the APP is in the discipline fostered in the conscious structuring and decisionmaking leading to a review and selection of optimum alternatives in arriving at the overall procurement course of action.

Business Clearance

Prior to entering into any large negotiated contract the procuring activity must submit a business clearance or a request for authority to contract, to the Chief of Naval Material for review and approval. Such request generally is required for all contracts over $5 million for hardware command acquisition and $600,000 for field activities. The business clearance memorandum details the justification of the price and other business aspects of the proposed contract. It is accompanied by various supporting data—for example: a statement of the proposed contractor's financial stability, a complete cost estimate, a justification of the reasonableness of the proposed contractor's estimated profit, a price comparison with previous purchases for the same or similar supplies or services, and other pertinent comments and substantiation of compliance with the provisions of Public Law 87–653—"Truth in negotiations."

The business clearance memorandums are reviewed by well-trained and experienced individuals who have the necessary expertise and judgment to help assure that the business aspects of the proposed contracts are, in fact, to the Government's advantage.

No commitment can be made to a prospective contractor prior to obtaining the Chief of Naval Material's approval of the business clearance memorandum.

I have addressed our early systems of review in the evolution of our major programs and the techniques and reviews employed in arriving at optimum contracting techniques. I would now like to discuss our project management effort and describe some of the recent improvements made in this area.

Program Management

In reviewing program management, it was found that responsibility had been spread over too broad a spectrum. In the past, program managers have not always been given the necessary degree of control over the financial and human resources required to adequately perform their jobs. Moreover, they frequently have not had adequate management information or cost control systems to let them effectively manage their programs.

The Navy has strengthened its program managers—given them more authority and more control over their resources. It is developing the management information and cost control systems which will help the program managers function more effectively and efficiently.

For example, the recent changes made in the area of ship acquisition management for the first time permit the ship acquisition project manager to have both total control over his funds and reports regarding the complete status of funds for his ship or project.

The instruction which authorized these changes strongly reiterates the concept that the ship acquisition project manager has the responsibility and authority to manage all aspects of this program as a complete entity. His authority to direct his project allows him to cross system command lines of authority, particularly important in his control over government furnished equipment.

The ship acquisition project manager will control those funds specifically budgeted and allocated for his ship project. He will direct funds and maintain a constant surveillance of financial status. He is kept informed of increases in cost prior to executing procurements.

Cost Growth

Before discussing cost growth, it is important to define the term to assure a common bond of understanding. Briefly, the term relates to the net change of an estimated or actual amount over some initially established base figure. The base must be relatable to a program, project or contract.

The base figure or original planning estimate is based on the initial estimates of cost arrived at following the conclusion of the concept formulation stage of system development. Normally the estimate is that found in the development concept paper prepared and approved prior to contract definition or an equivalent phase. It represents the initial program estimates approved by the Office of the Secretary of Defense.

Now, all cost growth, per se, is not necessarily avoidable. For example: A new enemy threat has been discerned and a new weapon is needed to counter it.

It may be less costly and more timely to alter a current weapon system to achieve this countering capability. Therefore, while the weapon costs more than envisioned, it is still less costly than developing a new system to counter the new threat. A careful examination of the trade-offs between additional costs and new capabilities is necessary, of course, prior to making any decision of this nature.

One of the most significant cost growth areas has occurred in ship construction and conversion programs. The causes are due to many interrelated factors. Some of these factors are essentially beyond the control of the Navy, others are not. The escalating nature of the economy at a pace far in excess of that envisioned and budgeted is among the former. Another is a marked change in market conditions associated with Southeast Asia. In recent years, this has caused bids to be received which often have far exceeded our estimates. To a large extent, these increases have been a reflection of market conditions plus the effects of an inflationary economy.

There are other factors, however, which have contributed to the cost growth and are within the power of the Navy to correct . . . many requiring improved program controls.

The Navy has initiated a series of remedial actions aimed toward overcoming these factors. These action areas include:

Continuing to build and improve a cost estimating capability within the Navy which can provide not only a better budgetary estimate but also a means of more accurately assessing the reasonableness of contractor proposals, thus fostering a basis for credibility with industry as well as DOD and the Congress.

Improved configuration managment, providing for better controls over changes particularly during the production phase of a program.

Increased emphasis on the selection and timely delivery of Government furnished equipment to assure compatability with contractor installation dates, availability of such equipment, and identification of fall back installations particularly when the GFE represents equipments with advanced characteristics in the development stage.

Increased emphasis on improving our ability to identify, analyze and evaluate technical and cost risk areas.

Maintaining development and production competition well into the production cycle, to be applied when the technical challenge during development and/or when production quantities and consumption rates are of a sufficient magnitude in relation to the added costs for continuance of such competition.

Utilization of performance specifications where practicable.

The increased attention to these and other areas will, we believe, assist to a large degree in controlling cost growth.

Ship Claims

One of the manifestations of cost growth and of concern to the Navy in particular are contractor claims in the shipbuilding and conversion program.

Contractor claims can result from a variety of reasons, for example, from defective or impossible to perform specifications. There are numerous other reasons for claims, such as unadjudicated change orders, inflation, constructive changes, late Government furnished equipment, to name but a few, however, I would like to emphasize that claims are not automatically accepted as valid—but carefully scrutinized for legitimacy.

Navy efforts to overcome this major area of concern fall into two areas—settlement of those claims now on hand and steps to overcome the number and magnitude of future claims.

To insure judicious and proper settlement, teams have been established for each major claim and new control and surveillance office under the Chief of Naval Material has been established. This office will review any request for contract adjustment amounting to $5M or more involving constructive change orders or claims based on defective or late Government furnished equipment and information or other administrative action or inaction of the Government. This new office for the first time will present a single focal point within the Navy where current information will be contained as to the status of major claims and from which coordinated advice will be given to the system commander regarding the handling of such claims.

The reductions in future claims action can be achieved by the same careful review improvements, which I have included in this statement, in the acquisition process that are being structured to minimize cost growth.

The considerations involved in the acquisition of our major systems are many faceted. I have cited a few to you in my statement. We are constantly reviewing the soft spots and mistakes resulting from past actions making compensating refinements and looking for better solutions to apply to our current acquisition efforts. This includes an examination of past contracting techniques, seeking methods which will hold down costs and reduce the number and magnitude of contractor claims and at an early stage clearly identify the risks involved and take corrective steps. However, contracting for the complex major weapon systems of today remains an elusive and not fully developed and mature art. We must constantly strive for improvement. In this regard, the Navy has recently employed a phased method of contracting. That is, an acquisition effort broken down into two or more parts, rather than attempting to select a contract type which would be applied against an entire acquisition. The early initial high risk stages of the program are identified and a cost type contract let for that portion, finally, shifting to a fixed-price type contract during the production or construction run.

Also as a means of reducing the potential of contractor claims, the Navy has shifted to greater use of performance specifications rather than detailed design specifications which has, in the past led to claims associated with inadequate or deficient specifications.

We have recently commenced employing milestone techniques in our contracts which identify key progress check points and permit an identification of funding implications of variations or delays in meeting these key points. Negotiations on such matters are conducted at the time of initial contracting vice negotiating later when a substantial portion of a program is already underway or complete causing the contractor to be in an advantageous negotiating position.

In connection with milestones—particularly those incorporated in contracts, it is important to differentiate between those milestones used for aircraft programs and those used for ships. Aircraft contractural milestones as used in the S–3 program, identifies specific development points which must be successfully demonstrated by the contractor before the aircraft is released for production. The contract also provides that in the event the contractor does not successfully demonstrate the milestones, production release for the particular lot involved may be slipped for six months at no increase in the option price.

A shipbuilding project, however, differs from any other weapon system procurement in that it is basically a construction and assembly project generally involving state or the art components and techniques rather than a development project involving prototypes prior to release to production. In such a project, as we identify a risk element, we intend to associate with this risk element a test and demonstration plan by which the risk can be shown to have been reduced or eliminated, and establish a fall back position which can be adopted should the test be unsuccessful. We also intend to provide a date by which a decision to proceed on the basis of preferred or fall back position will have to be made to avoid placing the production schedule or ship delivery dates in jeopardy. It is intended, where appropriate, in shipbuilding contracts that milestones identified will be listed in the contract together with language which will provide to the Government the unilateral right to extend the dates by which a contractor must be notified of the availability of funds for construction of subsequent increments of the contract. Such action would not affect ship delivery dates contained in the contract and any failure to deliver a ship in accordance with these dates will be covered separately in a liquidated damage clause. Use of milestones in major ship and aircraft programs is intended to provide a sound basis on which the Government can assess the contractor's performance at stated periods of time.

We have already started this technique, having applied it to the S–3 and advanced surface missile system contracts and are developing it for the forthcoming DD 963 and other contracts.

Other Programs

Other actions which have been initiated to improve the weapons acquisition process include the following:

Major programs are receiving more intensive review at the top management level.

More development testing of high disk components and subsystems during concept formulation phase.

Prototype competition and parallel development is being required when risks can be significantly reduced, costs are acceptable, and funds can be identified to cover the additional costs.

While all of the improvements discussed today are important Mr. Chairman, the best management information and control systems in the world would be useless without aggressive and intelligent managers.

Good men, those with the necessary background experience and training, are hard to find and their talents are in heavy demand throughout the Navy. The Navy, with the Department of Defense, has been carefully considering the actions necessary to assure not only the selection of our very best managers, for our major programs, but also optimum rotation policies which will provide for adequate overlap of relieving project managers, and coverage during critical program phases.

In addition, as I have already stated, we have increased the authority of our project managers, and given them the resources they need to effectively and efficiently accomplish their assigned mission.

The Navy has also embarked upon an aggressive training program designed to provide more and better weapons systems acquisition managers. We feel that all of their efforts which improve the quality of our available managers and the tools with which to do the jobs will go a long way towards achieving successful acquisition programs.

In conclusion, Mr. Chairman, the Navy is striving to achieve effective and economical acquisition of its weapon systems and supporting equipment. The Navy believes that the intensive evaluation of the weapon systems acquisition process which the Department of Defense and the Navy is carrying out will do much to achieve this objective. The goal of 100% effective, economical and flawless acquisition of major systems is highly elusive and may never be achieved. It will, however, remain as our basic objective. To accomplish this goal we are doing our very best to review the lessons learned from past mistakes and to apply them to our future efforts.

Should-Cost Approach

Chairman Proxmire. I would like to ask you for your comments on the "should cost" method of evaluating the efficiency of a contractor's operations. Monday, GAO gave us a very favorable interim report on its feasibility study and yesterday Gordon Rule, who pioneered in its development and use, made a strong endorsement of it. As you know, use of this approach by the Navy resulted in a $100 million price reduction on the TF–30 engine contract with Pratt & Whitney. The possibilities for its use seem to be great and I would think that the Navy above all would be the first agency to want to repeat it. Yet, the Navy has indicated that it does not plan a continuing "should cost" capability, nor does it intend to perform extensive review of the Pratt & Whitney type.

Why is the Navy dragging its feet?

Mr. Sanders. Mr. Chairman, before I discuss "should cost," which is a complicated subject, I might point out that as far as I know the Navy has no intention of not using "should cost."

Chairman Proxmire. Does it have any real intention of using it? As Mr. Rule pointed out, the Army seems to be interested in it, and proceeding with it, but the Navy not, although the Navy has had the favorable experience. Have you used it since the Pratt & Whitney experience?

Mr. Sanders. "Should cost" is a technique, sir.

Chairman Proxmire. Let me ask, have you used it since the Pratt & Whitney experience?

Mr. SANDERS. In a Pratt & Whitney situation?

Chairman PROXMIRE. In any way, have you used the "should cost" approach?

Mr. SANDERS. We have not had the opportunity or the occasion, sir, in the time I have been there to find a contractor which demands "should cost" in the Pratt & Whitney concept.

Chairman PROXMIRE. No cost overruns this year?

Mr. SANDERS. Sir, I did not say that.

Chairman PROXMIRE. Well, that would present the opportunity.

Mr. SANDERS. Let us take a look at "should cost," Senator, if I might, sir.

Chairman PROXMIRE. All right, go ahead.

Mr. SANDERS. The major "should cost" philosophy is basically that DOD should not endorse contract inefficiency by paying excess costs. This philosophy is fully stated in the ASPR, in our pricing policy and practice. In part, at least, it is being continually implemented, The big question is how to fully implement it in a practical manner.

As Mr. Rule has discussed before this subcommittee and elsewhere, the "should cost" concept, as demonstrated by Pratt & Whitney, has a limited but important utilization in our acquisition process of weapons systems. He has pointed out, and I must agree with him, that consideration should be confined to procurement areas of sole source. He and I are in agreement that it is impossible to realistically apply the technique used in Pratt & Whitney "should cost" approach to research and development.

Hence, we are talking about this, we are talking primarily, with reference to production procurement.

Mr. Rule has pointed out also, and I think this is very solid, the "should cost" approach is susceptible to application to those procurements not involved in definitive contracts.

He has pointed out, and I agree with him, that pertinent to the discussion of "should cost" is that the need would not exist if established Navy activities are fully and effectively performing their assigned duty.

As a matter of sound procurement practice, the Navy utilizes elements of "should cost" in all of its major weapons systems acquisitions.

Teams working in this field are composed of industrial engineers and other technical types who are skilled not only in determining what a component of a weapons system will cost but what it should cost.

The "should cost" principles are, as the Army is doing, an integral part of our Navy negotiating efforts.

Chairman PROXMIRE. Well, as I understand it, the Navy team used in the Pratt & Whitney effort, the Navy team at Pratt & Whitney, was entirely different from your usual procedure. It was sent in to determine why there was this very large overrun. It was preceded by a study done by a private consulting firm on contract with the Defense Department.

Let me say that many people believe that the private study contributed greatly to the success of the Navy study. One of the advantages of using a private consultant is that it does not have a vested interest in the procurement since it had nothing to do with it and, in theory, the private firm brings a certain amount of independence of

judgment to the review. Assuming the Navy will move forward with the "should cost" approach, have you given any thought to the desirability of using private consultant firms or do you believe this work should be done by Navy teams?

Mr. SANDERS. We need to find the skilled manpower, sir, necessary to do these jobs. That skilled manpower, if it does not exist in the Navy, should be brought in from private consulting firms.

Chairman PROXMIRE. You see, what disturbs me about your statement, Mr. Sanders, is that you indicated several areas where "should cost" cannot very well be used, and you are right in saying that there are areas.

You say it has to be confined to production; you say where you have a definitive contract it is not appropriate. But, at the same time, you have not been able to indicate a single instance since the Pratt & Whitney experience, which was so favorable, when you have been able to use it, and you say that elements of "should cost" are being used in your procurement generally. Well, that is the kind of a vague statement that is pretty hard for us to determine. It does not seem that you are using private consultants the way they were used in the Pratt & Whitney case.

It does not seem that you are sending in a team to spot and find out why there are big overruns and what you can do about them, the way you did in the Pratt & Whitney case.

Mr. SANDERS. Let me discuss this and ask for a comment from Captain Freeman on the specifics, sir.

The Navy learned lessons from "should cost" at Pratt & Whitney which we have applied.

I have just sat through the discussion leading to the contract award of the advanced surface missile system, for example, a major contract awarded, I believe, last week, sir.

There was a team which put that together; a team which worked very hard. It was a thrill to me to see on that team auditors, a group of industrial engineers, and other highly skilled technical personnel who had examined the contractor's proposal, his method, his proposed method, of operation; the activities that he proposed to follow in manufacturing and producing this weapons system and in addition had formulated their own independent cost estimate.

These are "should cost" techniques which we learned at Pratt & Whitney. They are being applied.

Should the occasion demand it, where we have a contract where our costs are going up the learning curve instead of down—for example, as was the case in Pratt & Whitney—the Navy would be prepared, to the best of our ability, to use "should cost."

Chairman PROXMIRE. That sounds as if there are plenty of opportunities, because, heaven knows, as we are going to indicate later when we go into the weapons systems that were analyzed by the Comptroller General, there are plenty of systems in which you are going up the learning curve in costs.

DSRV

Let me ask you about the DSRV.

One of the things wrong with the reports we receive from the Pentagon on weapons programs is that so much is left out. For example,

GAO gave us a summary of reports on 57 weapons systems and one of the most intriguing of all wasn't even on it, the Deep Submersible Rescue Vehicle, or the DSRV. That is the bathysphere, as you know, to rescue submarine crews when they suffer a disaster.

On June 1, I asked whether it was correct that the program had gone from $36.5 million for 12 vehicles to about $480 million for 6 vehicles, or an increase from $3 million to $80 million on a unit basis.

Although this program was not included in the summary reports we received, GAO is in the process of issuing its report on this matter, and, as you probably know, on Monday it substantially confirmed the figures I had obtained. In addition, it indicated serious reservations about the need for even six of these vehicles and suggested that only two would be sufficient, inasmuch as they said that there had only been two occasions in the last 40 years when this could have been used.

Why you have to have six of them when you only have to use them twice in 40 years, it would seem that one would be more than ample, and certainly two would be plenty. However, if only two were built, the cost of the program would run about $250 million, or $125 million each.

Now, what caused the enormous overruns on this program, and why did the Navy go ahead with it in the first place, and why were not corrective steps taken to eliminate the overruns; and, finally, why in this case can't we use a "should cost" study to get at it?

Mr. SANDERS. Let me make one statement, sir——

Chairman PROXMIRE. Yes, sir.

PROGRAM REQUIREMENT INCLUDES ONLY TWO DSRV's

Mr. SANDERS (continuing). With reference to this. This is part of that communication problem that seems to happen.

The Navy some time ago changed its program requirement for six DSRV's to two, sir. That is all that is included in the program at the present time.

Chairman PROXMIRE. It is a very interesting observation because I did not think we had that originally.

Mr. FROSCH. May I comment, Mr. Chairman?

Chairman PROXMIRE. You say at the present time there are two in the program?

Mr. SANDER. Dr. Frosch, sir, is intimately familiar with this program.

Mr. FROSCH. I would like to say a few things about it. But let me first answer the final question.

Since the budget activities of the fall of 1967 that defined the 1969 budget, there have been no more than two DSRV's in either the Navy or the Defense Department program.

During that budget process the project officer sent up a program change request asking permission to proceed to procure the additional four. In that budget process the Chief of Naval Operations denied three of them, and the budget process forwarded a request for an additional purchase which was denied by the Office of the Secretary of Defense.

In the subsequent budget processes, even though the project officer has asked for permission to procure four, this has been denied within

the Navy by the Office of the Chief of Naval Operations before getting to the secretarial level.

So what I am saying is at the present time while the project still carries within the project level an interest in going to a full set of six vehicles, the Navy program, as expressed in Navy official programing documents and in the Navy's forward-looking budget and in the ODS Defense plan, considers only two vehicles. I would consider it now to be a prototype program.

I would like, if I may, to go back over the history of this a little bit.

Chairman PROXMIRE. Let me ask you, as I understand it, the present plans of the Navy are for two?

Mr. FROSCH. That is correct.

Chairman PROXMIRE. Whether you go to six will be in the future, but the present amount is only two?

Mr. FROSCH. Precisely.

COST OF DSRV'S

Chairman PROXMIRE. That will be a $250 million program at a cost of $125 million per vehicle, as compared to an initial 12-vehicle program at a cost of $36 million; is that correct?

Mr. FROSCH. No, that is not correct, Mr. Chairman.

I think the numbers that have been used in this program have been considerably confused and confusing and, with your permission, I would like to review a little bit what happened in that program.

The first set of numbers that the GAO used were the report from the Deep Submergence Systems Review Board. This in no sense constituted an official Navy position on the program or an official Navy request to anybody to spend that money on the program. This was the report of a review group that was convened to give advice to the Secretary of the Navy.

They produced a report which suggested that at a cost of $36 million a 12-vehicle program could be produced. The vehicles that they were talking about were entirely different from the vehicles anybody ever decided to build. They were smaller, they were simpler, and they almost certainly could not have done the job.

The first formal piece of paper was a program change request that the Navy put in which was a request to initiate a program at a cost of $119 million.

Chairman PROXMIRE. What was it that that contemplated?

Mr. FROSCH. All right. That contemplated——

Chairman PROXMIRE. $119 million for what, how many vehicles?

Mr. FROSCH. That contemplated six vehicles, each vehicle of a design that would rescue 12 men in each single mating with the disabled submarine.

Now, there is an additional money factor which was obscured in the decision on that request. That request for $119 million was a portion of a request which encompassed not only the deep submergence rescue vehicle but the deep submergence search vehicle, and a number of engineering elements were common to both DSRV and DSSV, in addition to that request that was disallowed——

Chairman PROXMIRE. What is DSSV?

Mr. FROSCH. Deep submergence search vehicle. That request was disallowed. But in that disallowance no effect was taken of the common technical factor to so proceed with the DSSV program. The DSRV had to pick up the cost of those factors that were to be included between both programs. So that at that point the $119 million really had an additional $20 million to be added to it because of the severance of the DSSV. This makes about $139 million.

Now, here we have to decide what to do about including inflation between the time of that request and the current dollars.

Chairman PROXMIRE. What was the time of that request?

Mr. FROSCH. The time of that request was 1964, the original request. So we have got 4½ or 5 years of inflation.

I do not know what inflation figure the subcommittee would like to use, but at 6 percent, that runs to something between $35 and $40 million. So I would submit that a reasonable initial figure to talk about the DSRV program would be something in the range of $160 to $180 million.

Now, let me say something about the shift from 12 vehicles.

Chairman PROXMIRE. How many vehicles, that was for 12 vehicles?

Mr. FROSCH. That was for six vehicles, and you remember I noted each of these vehicles was designed to rescue 12 people on one pass, one mating with the disabled submarine.

In the course of defining the details of the design of the vehicle it became apparent in analyzing what would happen in a suitable scenario of rescue that it would be much preferable to increase the number of people who could be rescued even though this meant that the vehicle had to be somewhat larger and more complex, and so there was a shift from 12 vehicles to six vehicles.

There was also a change in the design of the vehicle to double the number of people who could be rescued. So the shift from 12 to 6—there was also a shift from 12 people per pass to 24. So that the six vehicles are rather different than those in the original PCR, and those vehicles were rather different from the DSSRG. So there are a number of complex changes in the program.

We have already mentioned the total program cost, which would be the cost to go to a total of six vehicles, and the total cost for two vehicles.

Chairman PROXMIRE. What would be the present estimate of the cost to go to six vehicles?

Mr. FROSCH. Somewhere in the neighborhood of $450 to $480 million.

Chairman PROXMIRE. So even on the basis of that explanation——

Mr. FROSCH. There is a cost growth.

Chairman PROXMIRE. You are a very competent man and obviously know this program very thoroughly. Even still, there is an overrun of 250 to 300 percent.

Mr. FROSCH. Yes.

Chairman PROXMIRE. From $160, $180 million up to $450 million.

Mr. FROSCH. That is correct. There is a very severe overrun, a very severe cost growth.

REASONS FOR COST OVERRUN

Chairman PROXMIRE. What is the explanation for that?

Mr. FROSCH. I will go into that.

Chairman PROXMIRE. This allows for inflation; this allows for the bigger vehicle; this allows for all the other elements that go into it.

Mr. FROSCH. Before I go into that I would like to comment on the use of the words, "overrun" and "cost growth." Overrun used to be a very precise technical term and, in fact, there are some things in this program that are valid overruns.

An overrun refers to a situation in which there was a cost-plus-fixed-fee contract in the course of which the contractor's costs went beyond the original estimate. Everything beyond the original estimate not caused by Government-induced changes was called an overrun.

Now, I would prefer to call this change of a large factor a cost growth because it contains elements that are due to Government-induced changes in the program, as well as elements of overrun.

Chairman PROXMIRE. It has both in them.

Mr. FROSCH. It has both in them.

Now, the first thing to be said about the reason for the cost growth is that the difficulty of the program was flatly and wildly underestimated by the original advisory group. They believed that a number of things could be done easily that were difficult.

They believed that a lot of the equipment that would go on the deep submergence rescue vehicle, the control equipment, the equipment and techniques for mating, the navigation equipment, the anchors, the winches, the sensors, the things that enable it to see and find the submarine and the hatch, the manipulator that is needed to clear away obstacles could be bought off the shelf from commercial suppliers of such equipment and, in fact, that appeared to be the case to the entire technical community at the time.

In the course of actual buying some of this equipment and testing it, it turned out that such was not the case; that the mean time before failure for a vehicle so equipped would be so short as to be useless.

So that almost all of the auxiliary equipment had to be designed and built specifically for the deep submergence rescue vehicle.

In addition, the materials to be used for the sphere, HY–140 steel, the spheres, the three steels in the vehicle which form the pressure vessel, was a new material about which something was known and it turned out to be very much more difficult to fabricate and weld than anyone believed at the time, and so there was considerable increases in cost in learning how to weld the materials safely and in getting welds that could be suitably inspected and tested.

Another example is the outer shroud which goes over the whole vehicle to streamline it and to contain those parts of the machinery that are external to the pressure hull. This turned out to be at the time the largest piece of fiberglass of its kind that had been so constructed, and there were considerable troubles in getting the material together correctly.

The only point I am making is that there were real technical reasons why the problem was considerably more difficult than anybody believed at the time.

COST OF TWO DSRV's

Chairman PROXMIRE. Well, I think you make your point extremely well.

However, I think there are some problems involved here.

First, let me ask you how much do you now estimate as the final cost of two of these vehicles?

Mr. FROSCH. We estimate—now I want to be quite precise, I am taking your question to mean the cost of manufacture of the vehicle.

Chairman PROXMIRE. Cost of the entire program if the Navy decides and the Defense Department decides to get only two of these.

Mr. FROSCH. All right.

The cost of the entire program, including the vehicles, the modifications to the submarines from which rescue is to be made, the modifications to two mother submarines capable of carrying and supporting the rescue, the modifications to the two ASR's that are to be used for this in case of surface rescue, such changes and special equipment as are required to test and to support a rescue, to provide training and training equipment, to provide special equipment so that they can in fact be carried in C–141's as planned, counting all of this, it is estimated, the estimated total is about $220 million, including test and operation through 1975.

RESCUABLE DISASTERS

Chairman PROXMIRE. Now, why do we need more than one of these if there have only been—perhaps we were misinformed, but we were told by the GAO that there have only been two occasions, only two occasions, in the last 40 years when this could have been used. Why do we now need more than one of these?

Mr. FROSCH. Well, I have a list of worldwide submarine disasters since 1920, all of which were in rescuable depth and which resulted in loss of life that could have been prevented by rescue, which is about 29 instances.

Chairman PROXMIRE. You said worldwide. How many of these are U.S. Navy?

Mr. FROSCH. About a third, to a half. I can tell you precisely, if I can have a minute, how many were U.S. Navy.

Chairman PROXMIRE. Were there other vehicles that could have done the job, could have performed the rescues?

Mr. FROSCH. Rescues could conceivably have been done in other ways but not by other vehicles because there have been, except for the McCann Bell, there has been no other vehicle that could mate to any of the submarines.

Chairman PROXMIRE. How long a period is this?

Mr. FROSCH. Since 1920.

Chairman PROXMIRE. Since 1920. So that in the last 50 years there have been about one a year, a little more than one a year, incidents when this might have been able to be used.

Mr. FROSCH. Mr. Chairman, I think what we are concerned about is not so much the number of times that the system would be used as we are concerned about the situation, which may be very rare, but could occur in which we would need it and not have it. That is, I can visualize the situation in which we have a downed submarine at a depth which is either dangerous for escape or beyond escape depth, in which we have a shipload of submariners trapped in the submarine,

and I can visualize a situation both in Congress and in the press and in the public and in the Navy if we were to be in a situation where we simply said, "I am sorry we have no rescue system that is adequate for that depth. We didn't prepare for it."

No Should-Cost Study of DSRV

Chairman Proxmire. Of course, when you have something like this, as you imply in your answer, there is no price you can put on human life, and none of us wants to put a price on human life. Whatever its cost, we want to go ahead and do it.

At the same time, one of the weaknesses we have is when we estimate these programs that are going to cost $36 million, we go ahead with them and then we find they cost a great deal more than that in some cases.

I am not talking about this particular program necessarily; in some cases we would not have made the decision to go ahead if we had known, had any idea, that the costs were going to be anything like what it turned out to be.

There has been a tendency, as Mr. Rule testified, not yesterday but several months ago, there has been a tendency on the part of the contractors and the Defense Department to play games with the Congress by telling us these programs are not going to cost very much, so we get committed to them, and once we get committed with them we feel bound to go ahead regardless of cost.

Tell me why we cannot have a "should cost" study here, why wouldn't this be appropriate inasmuch as you have said this is a program that ran into all kinds of technical problems that extended its cost?

Mr. Frosch. If by "should cost" you mean a Pratt & Whitney combination, which was a combination of audit and industrial engineering job, that was done on a manufacturing production line that was turning out a standard product in large numbers in a situation which was well understood by a manufacturing industry so that they were able to go in and look at things like machine usage, things like labor usage and labor rates, overtime, cost-accounting systems, and so on. It was well applicable to that.

This is a situation——

Charman Proxmire. Why aren't most of those things involved right here?

Mr. Frosch. Because there is no high rate manufacture. We are manufacturing at the moment two unique vehicles, one of which is entirely a research and development operation.

Chairman Proxmire. But it is still a question of efficiency.

Mr. Frosch. There are still questions of efficiency, but we believe that those questions are taken care of by the people we have in the plants of the manufacturer, and by the normal audit procedures. There is no special industrial engineering that could be suitably applied here.

Chairman Proxmire. Of course, that is what Secretary McNamara thought about the Pratt & Whitney program before we got into it with a "should cost."

NAVY SAR MISLEADING: DE–1052

Let me ask about another aspect of the system acquisition report, Mr. Sanders, the SAR, the Navy SAR. We find it misleading.

For example, the report on the DE–1052 destroyer program suggests that this billion dollar program has increased by only $1 million since 1964. But a look at the figures behind the totals show some very dubious practices on the part of the Navy. Two categories of costs have been simply deleted from the current estimate and transferred elsewhere because of "revised funding policy." Also, the large claims paid out against this program do not seem to be reflected in the totals. Is this correct?

Mr. SANDERS. The SAR report, as you mentioned earlier, is in its infancy. I picked this up myself and challenged it. I trust that in future reports changes of this type can be squared away so that all of the information that is required can be made available.

Chairman PROXMIRE. We surely hope so because I think the SAR has great possibilities. But as the GAO pointed out to us, there are all kinds of omissions, and there is a lack of information now upon which you can really make good defensible judgments.

Mr. SANDERS. Sir, I am certain that with the present interest of the Department of Defense, congressional committees, and individual Senators and Congressmen concerned something can be worked out to provide the proper report to give you all the information you need or require and, at the same time, not deluge you with a slug of paperwork which will be a mountain high and require a good bit of time to handle.

I feel confident this can be worked out, sir. Certainly, we will bend every effort to do so within the Navy.

Chairman PROXMIRE. The GAO told us Monday that instead of only a $1 million overrun there was a $300 million overrun in this program. Do you agree with that?

Mr. SANDERS. Admiral Sonenshein, sir, can comment on that.

Chairman PROXMIRE. Yes, sir.

Admiral SONENSHEIN. Some of these events occurred before my taking office, but examining the records——

Chairman PROXMIRE. When did you come to your present office?

Admiral SONENSHEIN. The 1st of August.

Chairman PROXMIRE. The 1st of August.

Admiral SONENSHEIN. But in examining the records I think what happened is there was a question of the dates of cutoff for entry into the SAR reports. Obviously to meet a deadline and submit the reports in timely fashion there must be a cutoff date on input.

For example, at the time the SAR was prepared, which was the basis for the GAO comment to you, a claim from Avondale on the DE's was not yet in hand and, therefore, since its value was not known and it was not received explicitly, it was not included at that time. However, the current, the latest, SAR which has been prepared under my direction includes all the known claims received on this program. They total roughly $290 million which, I think, relates to the $300 million that you heard of.

I would think it is important that you know, however, that compared to the original program for these ships of $1.286 billion for 46

ships, the latest SAR report, September 30 last, comes to $1.396 billion.

Chairman PROXMIRE. $1.396 billion?

Admiral SONENSHEIN. Yes, sir.

Chiarman PROXMIRE. And that compares to——

Admiral SONENSHEIN. And this includes an allowance for the settlement of the claims at a figure which I would rather not discuss.

Chairman PROXMIRE. Of course, the claims will be an element. There probably won't be a settlement, perhaps not at the top level, but it is likely to be an important element.

Admiral SONENSHEIN. Yes. So we have to allow for this.

Chairman PROXMIRE. There already has been one.

Admiral SONENSHEIN. One has been settled with Todd at $96.5 million.

Chairman PROXMIRE. Right.

Admiral SONENSHEIN. So, to summarize the total picture from the original planning estimates to the current SAR, the latest SAR, we have a growth of 8.6 percent.

Chairman PROXMIRE. What about the cost that you shifted out of the program?

Admiral SONENSHEIN. That was not an attempt to, as I see it from tracking the records, hide anything but there was a transference of the $104.5 million which was the difference between $1.286 billion which I mentioned a minute ago originally contemplated, and a Navy planning figure of $1.181 billion, our 5-year defense planning, as it was constituted on June 30.

Chairman PROXMIRE. But in transferring that out of the program, that cost out of the program, you do not have a comparison. You say it is only about an 8-percent increase.

Admiral SONENSHEIN. No; but the data I have just given you, the $1.396 billion current estimate includes all known cost of that nature. The 5-year defense plan was later adjusted.

Chairman PROXMIRE. But it does not include the payment of claims; does it include the $96 million payment?

Admiral SONENSHEIN. Yes, it includes the $96.5 million.

Chairman PROXMIRE. But it includes no other claims?

Admiral SONENSHEIN. It includes an allowance for settlement figure for those outstanding claims. I think I can summarize by saying that the previous report has been overtaken by the latest SAR September 30.

Chairman PROXMIRE. The planning estimate for the category of "Total project growth" was $142.24 million. The current estimate is $40.69 million. Why did this figure go down by $102 million?

Admiral SONENSHEIN. I believe that was due to the fact that the bids as originally received reflected that data. That reflects the bids as originally received.

Chairman PROXMIRE. Well, the planning estimate in the table I have here has $142 million, and the contract definition plan has $142 million, and the planned cost current quantities $142 million, and then the current estimate goes down to $40.69 million. You eliminate $102 million there and, therefore, show an overall reduction.

Admiral SONENSHEIN. Are you on the DE–1052, sir? Which SAR are you talking about?

Chairman PROXMIRE. I am talking about the 1052 report of June 30, 1969.

Admiral SONENSHEIN. I have the September 30 report, sir, with me, so I have difficulty in following your data. As I say, the September 30 report reflects the latest situation on this program.

Chairman PROXMIRE. What does the September figure show for a current estimate in your total program?

Admiral SONENSHEIN. For the current estimate total program——

Chairman PROXMIRE. Total project growth.

Admiral SONENSHEIN. Total project growth $29.56 million.

Chairman PROXMIRE. So it went down even further. In other words, here is a total project growth that is down from $142 million to $29 million. Where does that money go?

Mr. FROSCH. I think you are comparing a planning figure earlier in the program with a much better known figure now that the ships are built; isn't that correct?

Admiral SONENSHEIN. I presume that must be the case.

Chairman PROXMIRE. But that was built into your earlier estimate. It was built into your contract definition phase. It was built in when you made your planning estimate, and so forth, so you are building in an overrun that did not develop.

Admiral SONENSHEIN. You and I are looking at different columns. You are looking at the planning estimate column, $142.24 million.

Chairman PROXMIRE. Correct.

Admiral SONENSHEIN. And I checked you with that. But the current estimate in the 5-year defense program in the extreme righthand column in our latest calculation and estimation is $29.56. That is a change from the previous estimate.

Mr. FROSCH. Presumably, what that means is that the project grew less than was originally expected.

Chairman PROXMIRE. So that your original estimate had assumed that there was going to be a very substantial increase in cost; that increase in cost did not materalize and, therefore, you claim a saving, and you can show that the whole program did not increase as much as it really did.

CONTINGENCY FUND FOR PROGRAM GROWTH

Admiral SONENSHEIN. I think you have to recognize, Mr. Chairman, that each of our end cost estimates for a ship includes contingencies for this kind of growth.

We have an allowance for change orders, we have an allowance for future characteristic changes, we have an allowance for future escalation, and so forth. These are, in effect, reserves, and they are applied to these growth factors as they occur.

This is the latest aggregation of data on this program.

Chairman PROXMIRE. I think now I am getting an understanding of this. Isn't this item really a cost overrun fund set up at the outset in anticipation of possible cost increases as the program proceeds? Is it true that an amount for total project growth is budgeted for all shipbuilding programs?

Admiral SONENSHEIN. Yes, sir; but going back to what Dr. Frosch said——

Chairman PROXMIRE. Overrun reserves.

Admiral SONENSHEIN. They are not overruns, but we have a contingency for unfortunate occurrences. We have allowances, as I said a moment ago, in our original estimates for these factors I enumerated, escalation, change orders, future characteristic changes in certain amounts——

Chairman PROXMIRE. Yes.

Admiral SONENSHEIN (continuing). Based on statistical data available to us in prior programs.

Chairman PROXMIRE. But, after all, the contract definition and negotiation and cost estimation that goes on prior to the award of a contract, how do you justify throwing in an additional amount for project growth? Once it is included in a program budget, isn't there an incentive to use it up?

Admiral SONENSHEIN. I do not think so, sir. You have to appreciate that we are talking here of building 46 ships over a period of some 8 years, and I do not think there are enough geniuses around to predict these things with the precision that would result in a zero growth factor, sir.

Chairman PROXMIRE. Here we have a situation where you made this estimate a few years ago of apparently $142 million. It is now down to $29 million. We have had more inflation than most people anticipated. We have had a whole series of technological problems, as were described in the DSRV. They have not been that acute, but they have been visited on other shipbuilding programs, and yet there has been this perfectly miraculous reduction in project growth.

Admiral SONENSHEIN. No.

Mr. FROSCH. No; I think the point is simply this, Mr. Chairman, that originally that was carried as an allowance for project growth. As the project was carried through it grew and, in fact, some of that money has gone into the 8 percent that Admiral Sonenshein referred to. The remaining $29 million is the remainder of the allowance that has not already been known to be sopped up by escalation or other factors.

Chairman PROXMIRE. Let me ask, is project growth money part of the contract price?

Admiral SONENSHEIN. No, sir.

Chairman PROXMIRE. It is not?

Admiral SONENSHEIN. The basic construction contract with the shipbuilder normally constitutes on a broad average something on the order of 54 percent of the end cost of the ship.

The other factors would include, say, some 30 percent on a broad average for Government-furnished material. There would be 4 or 5 percent for escalation, about 2 percent for change orders, about 2 percent for postdelivery correction and, I think, I have allowed in these data for 100 percent, but the initial contract, therefore, is about 54 percent.

Ultimately, if change orders eventuate, as escalation occurs and future characteristic changes are accomplished, the total contract will grow something on the order of, perhaps, 70 percent.

Chairman PROXMIRE. But if the project growth money is not part of the contract price why shouldn't it be deleted from the planning estimate, and especially from the contract definition plans?

Admiral SONESHEIN. Well, sir, I think we need to go back to a very basic concept.

Back in 1961, the congressional committees concerned agreed with the Navy to what we now call the end cost concept of budgeting for ship acquisition. The idea was that when initially budgeted for and appropriated for, the cost would include all the factors that we have been discussing, the basic construction, an allowance for changes, future characteristics changes, escalation factors, and so forth, so that at the outset both parties would know the end cost of the ship, and this is the basis for all our budgeting in the shipbuilding program.

DE–1052 CLAIMS

Chairman PROXMIRE. Yesterday, Mr. Sanders, Mr. Rule, and I discussed some other aspects of the DE–1052 program. Can you tell us the total amount of claims pending against the Navy for the 46 ships in this program, total claims?

Mr. SANDERS. Mr. Chairman, I do not think that is information which we should put in a public record at the moment simply because we are engaged in very sensitive and delicate negotiations.

Chairman PROXMIRE. How can this possibly affect your negotiations, Mr. Sanders? The contractors know what the claims are, they filed the claims. They know what the claims are. This is not something that is of any real security nature. It seems to me the taxpayers ought to know that.

Mr. SANDERS. Each contractor knows what he filed, sir. I do not know that they know what each other filed. I do not know that those who might be contemplating additional changes are aware of what others have filed.

LATE DELIVERY OF GOVERNMENT-FURNISHED EQUIPMENT

Chairman PROXMIRE. You agree that one of the major causes or do you agree that one of the major causes of the claims paid out so far to the Todd Shipyards was the late delivery of the Government-furnished equipment?

Mr. SANDERS. That was certainly one of the key factors.

Chairman PROXMIRE. Was one of the principal items the AN/SQS–26 sonar?

Mr. SANDERS. Let me ask Admiral Sonenshein if he has that specifically.

Admiral SONENSHEIN. Yes, that is correct.

Chairman PROXMIRE. Is that correct?

Admiral SONENSHEIN. Yes, sir.

Chairman PROXMIRE. Which contractor produced the sonar?

Admiral SONENSHEIN. Excuse me, I would have to refer to my records, I am not sure of the answer to that question.

Chairman PROXMIRE. You do not know. And you do not know whether the Government's delay then was caused by the contractor's delay in processing the sonar?

Admiral SONENSHEIN. I do not know how much, sir.

Chairman PROXMIRE. Will you check that and supply it for the record?

Admiral SONENSHEIN. I can provide that.
(The information follows:)

EFFECT OF THE LATE DELIVERY OF THE AN/SQS-26CX SONAR ON THE TODD CONTRACT

1. With the execution of the shipbuilding contract with Todd Shipyards on 22 July 1964 both parties agreed that the Government might, by Change Order, delay the scheduled furnishing of the AN/SQS-26 sonar for any or all vessels by as much as 6 months beyond the delivery time for the sonar specified in the contract. The contract was modified on 8 February 1965, delaying delivery of each ship by 5 months.

2. It became evident that the Government could not provide the sonars in time to meet the required delivery dates for the early ships and a Change Order was issued on 14 October 1966 to specify "Post Construction" installation of the sonar on DE 1052, DE 1053 and DE 1054.

3. By contract modification on 29 September 1967 the delivery dates for the ships were delayed by twelve months for each ship. Accordingly, the requirement for installation of the sonars in DE 1052, DE 1053 and DE 1054 during construction was reinstated by contract modification on 7 December 1967. The new agreed-upon sonar delivery dates were then met for all of the Todd Ships and the ships were delivered with the sonars installed.

4. In substance, the delay in sonar delivery was not a factor in the Todd claim. However, the availability of the Associated Government Furnished Information (GFI) pertaining to design of the sonar was approximately one year late and became a significant part of the claim.

5. The AN/SQS-26CX sonar was furnished under contract with the General Electric Company.

Chairman PROXMIRE. All right, sir.

According to Mr. Rule, within a few months of the award of the first contract both the Navy and the shipbuilder knew there would be delivery delays. Shouldn't the Navy have anticipated the delays?

Mr. SANDERS. I do not know what Mr. Rule referred to in this instance. I would assume that, hopefully, they should have been anticipated.

U.S.S. "KNOX" A DEFECTIVE SHIP

Chairman PROXMIRE. Let me ask you this, Secretary Sanders. In addition to the cost overruns and delays, at least the first DE-1052 was a defective ship and it might still be a defective ship, and by "defective" I mean defective. It did not have some of the equipment on it. It did not have the armament on it.

When they had the first shock test it suffered the destruction of a great deal of the armament it did have and the equipment it did have.

Why was delivery of the *Knox* accepted by the Navy? Is it true that some of the equipment fell apart in shock tests?

Mr. SANDERS. Let me ask Admiral Sonenshein to give you the details on that, sir.

Admiral SONENSHEIN. I would like to comment on that shock test because it is a very important part of the program.

Chairman PROXMIRE. First, is it true when the *Knox* was delivered that it did not have some of the equipment and some of the armament that it was supposed to have?

Admiral SONENSHEIN. Yes, it is true certain of the electronic equipment, primarily the electronic countermeasures and the variable depth sonar, were not provided.

Chairman PROXMIRE. Were not provided?

Admiral SONENSHEIN. That is right.

Chairman PROXMIRE. And it was 20 months late?

Admiral SONENSHEIN. These are Government-furnished equipment items that we planned to install later through the post-shakedown availability or in subsequent periods.

Chairman PROXMIRE. And much of the armament also was not on the ship?

Admiral SONENSHEIN. No, sir; that is not correct.

Chairman PROXMIRE. That is not correct?

Admiral SONENSHEIN. No, sir.

Chairman PROXMIRE. We had testimony that some of the armament was not on the ship.

Admiral SONENSHEIN. No, sir.

Chairman PROXMIRE. Was the helicopter on the ship?

Admiral SONENSHEIN. These ships do not have helicopters yet provided. They are contemplated for future installation.

Chairman PROXMIRE. Not yet provided, but they were supposed to be, weren't they?

Admiral SONENSHEIN. No, sir; not at the time of the delivery. They were not supposed to be there. What was supposed to be on the ship was a hangar for the helicopters and supporting services, and they were so delivered.

Chairman PROXMIRE. There was a hangar but no helicopter?

Admiral SONENSHEIN. That is correct, sir. The shipbuilding contract does not provide for the construction or provision of the helicopters; that comes from another source.

EFFECTS OF SHOCK TEST

Chairman PROXMIRE. All right.

Now, tell us about the shock test.

Admiral SONENSHEIN. All right, sir.

The ships were the first surface ships to have a really intensive effort made to improve the shock resistance to underwater explosions. This, as you no doubt know, has been very common in our submarine construction for many years, our submarines having been built to very demanding, very rigorous, shock-resistance standards for several decades. But in the surface ships we have gotten into this effort at hardening within the last 10 years, and these ships represented a major step forward in this regard.

The actual shock tests that were performed were most gratifying compared to prior class ships of similar size and nature. For example, the DDG's, the guided missile destroyers, of about 4,000 tons that were built in the last 6 or 7 years had had similar shock tests conducted against them. *Knox*'s main propulsion equipment performed several quanta better than the DDG's did that had been built some 6 or 7 years ago.

For example, this ship lost no mobility. She was able to get underway and move directly from the test site, whereas the prior destroyer could not do so for several hours taken up in repairs.

Chairman PROXMIRE. Let me say, however, there was considerable damage and destruction done by that shock test. If this was better than before, it must be all the other ships had been sunk because let me

just point out the Government-supplied equipment was damaged as follows as I understand it. No. 1, the ASROC launcher was destroyed.

Admiral SONENSHEIN. Oh, no, sir.

Chairman PROXMIRE. "ASROC (antisubmarine rocket). Installed and operates fairly well but lacks minor changes such as ORDALTS and change 206. Shock test on September 30, 1969, destroyed the Government-furnished launcher whereas the contractor-furnished loading equipment was undamaged." Is that correct?

Mr. FROSCH. Mr. Chairman, I would like to comment a little bit on the matter of the philosophy of the testing things. When one wants to test a lead ship of a class or anything else which is the first article, in order to find out how strong it is you really want to make a test that breaks something because, if you don't, you don't have any idea what the strength is.

You know, I can test this glass by tapping it that way, and I have found out approximately nothing. If I destroy it completely I have found out very little. But if I can tap it to the strength which just cracks it that is precisely how I find out what the strength is.

Now, why do we bother to do this where a whole ship which is clearly fairly expensive in repairing what we have broken? Simply because there is no technology for predicting it well enough, so that a test which simply told us, unless it was a gigantic test, that nothing was broken at all would not tell us what the strength of the ship was.

Incidentally the shock standards do not require that everything on the ship remain unbroken. That would be prohibitively expensive as a requirement because one can always make an explosion shock test that will break something.

In fact, the equipment is divided into several categories, categories that must not break such as we would like for main propulsion machinery, categories that will break in such a way that they don't endanger human life or key equipment, and categories where it is all right for them to break because they are not essential, absolutely essential, for the ship operation in combat. It is a fairly complex business.

Chairman PROXMIRE. There is a highly technical and technological business here. I don't pretend to be an expert on this but I wanted to get it on the record. Let me ask you about a situation that disturbed me and puzzles me very much. The Board of Inspection and Survey of the Navy Department communicated on the 6th of March 1969 to the Secretary of the Navy with regard to the *Knox*, the ship, the condition it was in when it was delivered as follows:

> The Board finds there are serious deficiencies in *Knox* that make her unacceptable for unrestricted fileet service and these deficiencies significantly degrade her ability to carry out all of her assigned wartime missions and tasks.

And then goes into the details.

How many other ships have been delivered of this class?

Admiral SONENSHEIN. There are five others delivered altogether, sir.

Chairman PROXMIRE. Five delivered?

Admiral SONENSHEIN. Yes, sir, five others.

Condition of Other DE–1052 Class Ships

Chairman Proxmire. Are they in the same condition as the *Knox*?

Admiral Sonenshein. I can't answer explicitly. I don't know. I will have to provide that to you later, sir, as to the specifics.

Chairman Proxmire. Will you provide that for the record?

Admiral Sonenshein. I certainly shall.

(The data follows:)

INSURV Reports on DE–1052 Class Ships Acceptance Trials

The Board of Inspection and Survey reports, such as submitted on the USS *Knox* (DE 1052), describe the status of condition of a ship and the Board's findings of its status at a point in time three to four weeks prior to actual delivery of the ship to the Government. During this period of time, the builder is required to correct those deficiencies for which he is responsible. Acceptance of the ship by the Government is contingent upon fulfillment of this requirement. No ship in this program has been accepted without correction of those major deficiencies for which the builder can be held responsible. Most of the significant deficiencies that have been reported by the President of the Board of Inspection and Survey fall under the category of Government responsibility. These latter discrepancies are corrected at naval shipyards after delivery of the ship by the builders and before service with the active fleet.

As was found on the *Knox*, the major deficiencies on the following five ships relate primarily to noninstalled late Government furnished equipment and to certain technical problems relating to performance of Government installed equipment.

Major problems not yet resolved involve the AN/SPS–40 Radar (target range acquisition) and the SQS–26 Sonar (ship self-noise levels appear excessive).

Solutions on other mechanical and electronic deficiencies reported have been found and corrective action is being taken. These include such things as adjustment and correction of magnetic switches on the 5''/54 gun system, correction of deficiencies in AN/SPN–40 LORAN and other Government furnished equipment. Certain other deficiencies will be corrected by a ship class change in the future. For example, improved machinery accessibility and improved replenishment at sea capability are illustrative of such items.

Missing Government furnished equipment, due to late delivery, constitutes a major deficiency for the IFF system, the ECM system and the Variable Depth Sonar.

These equipments will be installed when available, and every effort to secure early delivery is being exerted by the Navy.

Certain other deficiencies noted by the Board of Inspection and Survey reports relate to increased or changed ships characteristics. These are recommendations for an additional 5''/54 gun, point defense missiles, a vertical replenishment capability, and other equipments not contained in the basic ship characteristic envelope. These are therefore not deficiencies to the current ship configuration baseline, but recommendations for improved or increased characteristics.

The above includes the major deficiencies from the applicable preliminary acceptance trials on the six DE 1052 class ships delivered to the Navy. In addition, as is normally the case, the Board's reports included a wide range of minor deficiencies such as missing spanner wrenches, rubber matting not installed, and unsigned test memos.

Admiral Sonenshein. But I would like to comment on the Board of Inspection and Survey. This is the lead ship of a large class of ships, and the number of deficiencies, just on a gross basis, that were reported was not unusual for this type of ship compared to prior classes of destroyer escorts.

Also one must recall——

Chairman Proxmire. Well, Mr. Rule testified yesterday that it would be, and I use the descriptive term I think he used, "it would be a hell of a ship if it were delivered in this condition."

Admiral SONENSHEIN. Well, I don't know the basis of Mr. Rule's judgment, sir, in this area.

Chairman PROXMIRE. We asked him if it was normal to get ships delivered in this kind of condition.

Admiral SONENSHEIN. No, I wanted to go on to say ships are very complicated construction projects, as you appreciate, and we have provided for each ship a period called the postshakedown availability during which shortly after the ship is delivered corrective work is accomplished after the ship has had a chance to shake itself down by several months of operation. During the postshakedown availabilities of our ships most of the discrepancies that have been decided as needed to be corrected are accomplished.

I might also say that the Board of Inspection and Survey has special functions to perform with regard to the acceptance of ships. One is to say whether the ship has met the specifications, the contract requirements. In addition to that the Board of Inspection and Survey has a responsibility to say where it thinks improvements are needed in design and this goes beyond the contractual aspects. Their report, when received, is an advisory report, and final action is taken on that in the headquarters here. On each item there is an adjudication made as to whether the item that is reported needs to be corrected. Of course, their judgment may not be finally accepted.

Second, the board reports whether the items are a Government responsibility, and third, whether the contractor should correct the item. These actions have been taken with regard to the *Knox* and each of the deficiencies has been identified in this manner. During the postshakedown availability of this and other ships, the majority of the items that have been adjudicated as necessary to be accomplished will be corrected. As a matter of fact, any item that pertains to other ships of the class, that is to say, it is not a workmanship deficiency but is a class itetm, is identified and applied to the ships downstream.

The *Knox*, for example, the record shows that some 58 items have been identified for correction in the subsequent ships and that will be incorporated in their postshakedown or in their basic construction depending on their——

POSEIDON PROGRAM

Chairman PROXMIRE. I would like to ask you to discuss, Mr. Secretary, the Poseidon. Briefly, for the record, will you tell us what this program is, when it was started, when it will be completed and how many conversions have been accomplished so far and how much money has been spent on it up to now? I understand you may have a substantial statement wth regard to the Poseidon. If you would want to place that in the record and then breifly summarize the status of the Poseidon you may do so.

Mr. SANDERS. Admiral Smith, sir, is here to discuss the Poseidon. He is the Director of the Strategic Systems Project Office.

Chairman PROXMIRE. Admiral Smith.

Mr. SANDERS. Admiral Smith has been concerned with the entire fleet ballistic missile systems for a long time, sir.

Chairman PROXMIRE. First, tell us what the program is.

Admiral SMITH. Sir, I believe I could read this statement in about 5 minutes.

Chairman PROXMIRE. All right. Well, I would appreciate it if you could summarize the statement and put it in the record and give us the highlights because it is not—go ahead, to put you more at ease, go ahead.

PREPARED STATEMENT OF ADMIRAL LEVERING SMITH

Admiral SMITH. To aid in your judgment of what I will later say, I will first note that last September I commenced my 26th consecutive year in positions of responsible charge of weapon system acquisition at the forefront of technology, after 12 years of operational experience. The first 3, of these 25 years, were in the research and development division of the Navy Bureau of Ordnance. The next nearly 7 were at the Naval Ordnance Station, China Lake, Calif.; the first 3 as deputy head and head of a large department developing and prototype manufacturing unguided missiles as well as manufacturing the chemical explosives portion of fusion nuclear warheads; the last over 3 years as deputy technical director of the station. In all of these positions at China Lake, my immediate superior was a very high level civil servant and the organizations for which I was responsible were almost entirely manned by civil servants. The next nearly 2 years were in command of the Navy test facilities, White Sands, N. Mex., responsible for flight testing guided missiles. The last nearly 14 years were in the Navy Special Projects Office, responsible for the development, manufacturing, and maintenance of the Polaris and Poseidon weapon systems; the first 9 years as technical director and the last nearly 5 as director.

In order to discuss in specific terms the business and technical management methods we are using and plan to use on the Poseidon acquisition, I propose to describe the methods actually used for the Polaris A–3 acquisition and then note the current and planned differences for the Poseidon.

The original planning for acquisition of the FBM weapon system called for a single prime contractor. However, recognizing the arguments for breakout and recognizing that the submarine weapon system could be designed to have four independently testable subsystems, it was decided to contract for the Polaris weapon system development and production of each of these subsystems with a separate contractor. Since the navigation, fire control, launcher, and missile subsystems could conceptually be designed so that each would be independently testable, we could thereby avoid the major hazard involved in breakout. However, we then needed to arrange to so manage the development and production as to assure that all these subsystems combined to form a complete, reliable, maintainable system giving no less and no more performance than needed, with each subsystem contributing its appropriate share to performance and reliability. This was accomplished by organizing our Office to provide a branch responsible for planning, budgeting for, and technically directing the development, production, and maintenance of each subsystem; by assigning an independently testable performance, reliability, and manning goal to each subsystem; by developing and imposing on each subsystem, subject to acceptance by the responsible branch and contractor, detailed criteria defining its interface with each of its neighbor

subsystems; by developing instrumentation to measure the performance and reliability contribution of each subsystem when assembled into a complete weapon system in the submarine and providing an organization to conduct detailed engineering and statistical analyses of these measurements; and by providing a technical and business organization at each of the subsystem prime contractor principal plants directly responsible to our office here in Washington.

The plans and budgets developed by these subsystem branches, based on force level decisions of the Secretary of Defense, were searchingly and critically reviewed in the greatest possible detail at least semiannually, by the resources branch—the comptroller organization—of our office in company with the three senior officials of the office to assure to the best of their ability that the plans were neither too risky nor too cautious and that the funds requested were neither excessive nor insufficient to carry out the plans. The budgets were also critically reviewed by the Navy Department, the Office of the Secretary of Defense, and the Congress. Funds as appropriated and apportioned were allocated for the detailed specific purposes called for by the approved plans to the subsystem branches. Procurement requests were prepared against these detailed allocations by the subsystem branches, reviewed for compliance with the allocation and specific purpose, and approved by the division director and deputy project director. The type of contract and major contract terms were recommended by the subsystem branch, subject to specific concurrence of the division and project director, but all contract terms were decided by an independent contracting officer subject to the approval of the Chief of Navy Material.

In the Polaris program it would have been both conceited and foolhardy for us to have purported, or agreed, that we could, before development, have set up firm subsystem contractual requirements for performance, reliability, and detailed interfaces. It was therefore necessary for us to set subsystem performance and reliability goals, rather than requirements, and work out the details of the interfaces as we progressed with annual CPFF level-of-effort contracts for development and testing of the subsystems. This placed the real responsibility on me, rather than the contractors, to insure that we had a consistent set of goals and interfaces which would actually be attained. I also considered it necessary that these goals be attainable within the appropriated funds because I had early learned that I could not truly depend on someone else for prompt enough reprograming of funds in order to attain a preselected performance.

Meeting this responsibility required detailed knowledge of progress and true understanding of problems limiting progress. For this purpose we used detailed weekly reports from the technical and business offices at the prime contractor principal plants; weekly oral technical, fiscal and contracting reports from—and discussions with—all headquarters branches; weekly evaluations by an independent headquarters group; monthly pert reports on development contracts, and line-of-balance reports on production contracts, monthly contractor reports, and detailed contractor analyses of test failures; frequent working-level meetings and discussions with contractor personnel; and bimonthly reviews of the entire program with prime contractor management personnel—generally one level above the highest level full time on the Polaris program.

Chairman PROXMIRE. Are you just about through or do you want to put the rest in the record? Why don't you put the rest in the record.

Admiral SMITH. Yes.

(The remainder of Rear Admiral Smith's prepared statement, paralleling his oral statement, follows:)

REMAINDER OF PREPARED STATEMENT OF REAR ADM. LEVERING SMITH

During the A–1/A–2 Polaris program we had procured production hardware on the basis of rather detailed drawings and specifications. This practice eliminated contractor implemented engineering changes but placed great reliance on the Government and contractor inspection organizations. It worked reasonably well but we were far from satisfied with the reliability results. Consequently, we developed our own guidance which provided contractor management with specific directions for developing, implementing and maintaining a product quality program adequate for this method of production procurement. We also provided for periodic, detailed evaluations and reviews of both contractor and contract administration office product quality programs. Early in the Polaris A–3 development program, we injected these prime and sub-contractor product quality organizations into the development program; not for the purpose of accepting or rejecting but for the purpose of measuring attributes to the best accuracy reasonably available and recording the measurements.

This policy greatly improved the availability of formal inspection procedures and controls at the start of production. Also in the A–3 development program we undertook to develop and qualify multiple component sources to a considerably greater extent than in the A–1/A–2 program. This was done primarily to protect the Polaris schedule, to which President Kennedy had assigned major importance, but also in hopes that competition would reduce production costs enough to more than offset the added development costs. These two changes gave me data to confirm two opinions which, stimulated by a number of observations, I had logically deduced several years earlier. The first is that a great deal of costly experimentation is needed to identify and determine enough of the material attributes and process variables, and their limits, to assure that components manufactured within these limits will reliably perform in complex equipments and missiles. However, qualification testing of a specific manufacturer's product, as complete as required for the original development, combined with less complete inspection, will provide assurance of reliable performance. The second is that, in the type of programs I have been responsible for, it is very seldom obvious that the added cost of developing multiple qaulified component sources will be offset by lowered production costs.

The A–3 missiles were procured to detailed Government authenticated drawings, required manufacturing processes, inspections and acceptance test criteria in annual buys under sole source negotiated cost reimbursement contracts. The first production contract was a cost plus incentive fee contract negotiated sole source pursuant to the authority of Armed Services Proocurement Regulation 3–214. To accomplish this, we proposed an incentive matrix based on cost, demonstrated flight reliability, low numbers of waivers, and schedule compliance. By use of an initial letter contract we were able to improve our actual cost knowledge. The contractor submitted a definitive proposal some months later. This proposal was then reviewed and evaluated by the resident audit agency and the contract administration office. The audit review consists of an evaluation of labor and overhead rates, material prices and such other elements as can be verified through audit records. The CAO evaluates the technical aspects, including method of manufacturing test procedures, tooling and test equipment, etc., based on the methods and procedures successfully used for manufacture of the experimental missiles. He evaluates the proposed labor hours in each labor category, relating to labor hours used on the successful experimental missiles and data on prior missile production, comments and makes recommendations on the reasonableness of the proposal. These reports are then reviewed by the negotiator and the subssystem branch after which a pre-negotiation conference is held, with all four groups participating, to establish a pre-negotiation position for cost and fee.

The negotiator then writes a pre-negotiation business clearance which is reviewed and approved by the contracting officer and the Office of the Chief of Naval Material. Negotiations are then entered into with the contractor, starting

with manufacturing labor, to each general agreement on the direct hours required for each labor category using such factors as evaluation of manufacturing standards, factory realization achieved against standards, learning curve projections, historical data, and actual charges to determine reasonableness. Proposed purchase orders and subcontracts are thoroughly reviewed with high dollar orders receiving assist audits by the audit agency cognizant of the particular vendor. These prices are compared with previous prices. the large dollar value subcontracts, like missile motors, are reviwed in pre-negotiation meetings between the prime contractor and Government personnel with the Government retaining approval control. Upon conclusion of the detailed reviews, discussions and negotiations the prime contractor and the Government usually differ by only a few percentage points and after several exchanges of offers agreement is reached on a cost figure, target fee, and incentive fee relationships.

This negotiation procedure was also used for the production contracts for the other subsystems, which after the first were also CPIF, followed later by fixed price incentive, and for the sufficient missile production contracts which were FPI. Usuing these procedures actual costs have been within 5% of contract target cost for 95% of our procurements. This would not necessarily have been a good performance unless the negotiated traget cost showed reasonable reduction in subsequent buys. In the A–3 program all of the subsystem procurements did show such reduction of target costs. For each doubling of quantity the missile target reduced 6%; the guidance 12%; the fire control 10%; and the launcher 8%.

For the A–3 missile guidance system we undertook the cost of developing and qualifying by ground and flight tests an additional production source for the gimbal assembly, and for the electronic assembly as well as two addtitional production sources for the guidance inertial components. One additional production source was developed and qualified for the A–3 fire control system and one additional source was developed and qualified for navigation gyroscopes.

On 26 November 1963, after we had devoted more than three years to study and exploratory development of ways to overcome the valid criticism of our efforts to assure penetration of ABM defense by the A–2 and A–3 missiles, the Secretary of Defense directed inclusion in the FY 1965 budget proposals to the President of plans for a competitive contract definition (then known as project definition phase) for development of a new ABM weapon system (later to be know as Poseidon). We were quite doubtful that we possessed the ability to obtain a reliable product by means of fixed price contracts with contractors selected by competitive contract definition or by means of incentive contracts with contractors selected by competitive contract definition without massive cost and time overruns. However, we were quite certain that we could not prepare adequate requests for proposals for contract definition studies without engineering assistance from the then existing group of A–3 weapon system and submarine design contractors. We therefore requested and obtained authority to contract for this engineering assistance. As we proceeded with preparation of the requests for proposal and disclosed more and more problems, we became convinced that in this case of competitive contract definition was not in the best interest of the Government. After careful consideration, the Assistant Secretary of the Navy (Research and Development) on 4 June 1964 so concluded and urged the Director, Defense Research and Engineering to approve preparation of non-competitive contract definition (PDP) by the current (A–3) team of prime and principal subcontractors.

He based his conclusion and recommendation on the economic need for minimum modification of the A–3 weapon system equipment, the great complexity and detail of the necessary interfaces, the significant government investment in the A–3 contractors to acquire special knowledge and knowhow, and the demonstrated superior performance on the A–1, A–2 and A–3 weapon systems, as well as the harmonious working relationships, of the current A–3 contractors. He further concluded that the principal objective of the competitive PDP to establish realistic design objectives and cost estimates for the ensuing development could and would be achieved by a sole source PDP conducted by the current (A–3) contractor teams. The office of the Secretary of Defense agreed with the conclusions of the Assistant Secretary of the Navy except that they believed that the missile propulsion motors and their interfaces could be adequately defined for competitive contract definition without excessive effort. On 27 October 1964 the Director, Defense Research and Engineering approved the non-competitive PDP with the proviso that there be a competitive selection of (missile) propulsion system contractors.

Contract definition of all subsystems was completed by October 1965 at a cost of $30.5 million. During this time all subsystem performance and reliability goals were established and design approaches were well enough developed to establish detailed subsystem interfaces so that they could be incorporated as contractual requirements in the CPIF development contracts. Also all material to be delivered by one subsystem contractor to another subsystem contractor for use in his development was identified and scheduled for incorporation as GFE commitments in the CPIF development contracts.

Engineering development of the Poseidon weapon system began in March 1966 but by that summer the Secretary of Defense decided to recommend operational system development for deployment in late 1970 to the President. In support of this decision we submitted in October a new plan including cost estimates for development and production. These cost estimates constitute the basis of the C.D. plan shown in the program status reports submitted to the Congress.

Since no new information had been generated (other than new re-entry body studies), since October 1965 it was necessary that the costs for production be based on the 1965 C.D. studies. I would note that C.D. studies are for the purpose of determining development practicability and do not result in hardware designs. Hence, except for the much greater complexity and advanced technology, the C.D. plan production cost estimates can be compared with an architect's estimate, made before A&E design, for a major building to be built four or five years in the future.

The Lockheed Poseidon development contract was the most complex of all the subsystem contracts. It is a single CPIF contract covering the entire design development and testing of the Poseidon missile and all related missile support equipment plus production of the first 84 Poseidon tactical missiles. This contract also included production of missile support and checkout equipment to outfit the missile assembly facility at Charleston, S.C., two tenders, 10 Poseidon submarines and five shipyards, as well as field service engineering, repair parts, and repair and logistic services for all hardware produced. The development effort is incrementally funded over a six-year period with limits of liability specified for each fiscal year. The production effort is funded to completion in the fiscal year authorized. The contract incorporates by reference two design objective documents and provides that the contractor shall perform effort as needed to achieve these objectives. By terms of the contract, he is permitted to make design changes within the variables permitted by the design objective documents until the date the first Poseidon deploys but all hardware produced under the contract must conform to the configuration of the missiles and support equipment in the first Poseidon submarine. Subsequent design changes can only be made by contract change. The prime benefit of this contract is that the consolidated contract with fully structured incentives requires the contractor to be concerned with *total* program cost and performance. He knows the production costs he must initially live with at the time he performs the design work. The second missile production buy is being negotiated on condition of conformance to the first buy delivered configuration.

The other subsystem development contracts are also CPIF and similar, except less complex. The production follow-on contracts will be with the same contractors and will be CPIF or FPI negotiated contracts as in the Polaris A–3 program.

The progress and problem reporting system is unchanged except that pert-cost is specified in all development contracts and detailed reporting of problems and proposed solutions is done by contractors rather than branches, except when contract changes are required. Configuration control and production quality control are slightly tightened and delegation of waiver authority has been reduced. Budget reviews are more and more critical and searching. No additional production sources have been developed for the fire control, guidance gimbal assembly, or navigation gyroscopes. One additional production source has been developed and is being qualified by ground and flight test for guidance inertial components and an additional production source is being developed for the guidance electronic assembly. The number of Poseidon Missile principal components for which dual production sources are being developed and qualified by ground and flight tests is seven out of 25 as compared to 20 out of 29 in the case of the A–3 missile.

The Poseidon program status report for the quarter ended 30 September 1969 shows a contract definition plan development cost estimate of $1,236 million and a current estimate of the total development cost of $1,516 million, a growth of

$280 million. $170 million of this growth is for capability increase authorized subsequent to the contract definition plan. The remaining $110 million which is 8.9% is the sum of over and under-estimates and inflation since 1965 and projected to 1972. This program status report also shows a contract definition plan production cost estimate of $3,258 million and a current estimate of the total production (i.e., acquisition) cost of $4,135, a growth of $877 million, $259 million of this growth is for acquisition of the capability increase authorized subsequent to the contract definition plan. The remaining growth of $618 million, which is 19% consists, to the best of my ability to estimate, of an under-estimate of $207 million, which is 6.3%, and inflation greater than that projected in 1965 of $411 million. Assuming, to simplify the calculation, that the inflation is evenly distributed over the seven years of production (1969–1975), then inflation is now estimated to be 4.5% per year. The under-estimate of $207 million is made up of a growth of $429 million reduced by a program reduction of $222 million.

Chairman PROXMIRE. As I understand it and correct me if I am wrong, this is strictly a layman's view, the Poseidon's program is a program for converting our present Polaris system into a multiwarhead system so that the submarines have that much more firepower, and much more capability; is that correct overall?

Admiral SMITH. Yes; as I mentioned in my statement the Polaris system, and hence the Poseidon system, breaks down into these subsystems of navigation, fire control, launcher, and missile.

Chairman PROXMIRE. Yes; I am sure it is much more complicated than I described it but, in general, this is the general public view and it is about right, isn't it, that what they are trying to do is to greatly increase the firepower, and it does. It is, I think, a most important program. In fact I think it is the greatest deterrent we have.

Admiral SMITH. This is an important program.

Chairman PROXMIRE. It is mobile, under the ocean; all the advantages it has, it is a mobile system and the questions I will ask are because I am concerned about its cost. When did it start?

Admiral SMITH. The studies date back to about 1960.

As I note in my statement, the Secretary of Defense approved going ahead with what later became a contract definition study in November 1963. The contract definition, that was for inclusion in the 1965 budget proposals—the contract definition started in, early in, 1965, was completed in October of 1965. Development started in March of 1966.

Chairman PROXMIRE. I think that gives it to us. All right. When will the program be completed?

Admiral SMITH. The current plans are that the last conversion and the last missile production for initial acquisition will be in fiscal year 1975.

Chairman PROXMIRE. How many conversions have been accomplished so far?

Admiral SMITH. None have been completed so far. The first is to be completed this next summer, and six have been started.

TOTAL POSEIDON EXPENDITURES TO DATE

Chairman PROXMIRE. How much money has been spent on the program up to now?

Admiral SMITH. I don't have handy the expenditures.

Chairman PROXMIRE. Will you provide that for the record?

Admiral SMITH. I will provide that for the record.

(The data follows:)

Total expenditures for the Poseidon program through 30 November 1969 were $1,637 million. This total includes support costs such as the overhaul portion of submarine conversions and replenishment spares, which are not included among the acquisition costs in the Selected Acquisition Report.

Chairman PROXMIRE. Would it be fair to say that the Polaris nuclear submarine missile program was done over the past several years, Polaris that is, on a crash basis but it has been a highly successful weapons system?

Admiral SMITH. It was done with a great deal of attention to schedule. I recognize that some people would call it crash. I didn't really think of it in those terms.

TOTAL COSTS OF POLARIS PROGRAM

Chairman PROXMIRE. What was the total cost of Polaris?

Admiral SMITH. Of the order of $13 billion.

Chairman PROXMIRE. In the order of $13 billion. Will you provide the precise figure for the record?

Admiral SMITH. Yes, sir.

(The data follows:)

Total acquisition costs for the Polaris A–1 and A–2 programs are estimated at $5,173.9 million. Total acquisition costs for the Polaris A–3 program are estimated at $4,591,0 million.

Average unit costs for Polaris missiles, by type are as follows:

	Millions
Polaris A–1	$1.40
Polaris A–2	1.22
Polaris A–3	1.46

Chairman PROXMIRE. Now, it is planned to convert 31 of the Polaris subs to carry the Poseidon missiles which carry MIRV warheads; correct?

Admiral SMITH. Yes, sir.

POSEIDON COST OVERRUN

Chairman PROXMIRE. And figures provided the Congress show a cost overrun for Poseidon or a cost growth of about, $1.2 billion. Can you tell us briefly why the costs have risen to this extent and what portions of the program have experienced the largest increases?

Admiral SMITH. If I may read from the last paragraph of my statement—

The Poseidon program status report for the quarter ended September 30, 1969 shows a contract definition plan development cost estimate of $1,236 million and a current estimate of the total development cost of $1,516 million, a growth of $280 million. $170 million of this growth is for capability increase authorized subsequent to the contract definition plan. The remaining $110 million which is 8.9 percent is the sum of over and under-estimates and inflation since 1965 and projected to 1972, the completion of the development. This program status report also shows a contract definition plan production cost estimate of $3,258 million and a current estimate of the total production (i.e., acquisition) cost of $4,135, a growth of $877 million. $259 million of this growth is for acquisition of the capability increase authorized subsequent to the contract definition plan. The remaining growth of $618 million, which is 19 percent consists, to the best of my ability to estimate, of an under-estimate of $207 million, which is 6.3 percent, and inflation greater than that projected in 1965 of $411 million. Assuming, to simplify the calculation, that the inflation is evenly distributed over the

seven years of production (1969–1975), then inflation is now estimated to be 4.5 percent per year. The under-estimate of $207 million is made up of a growth of $429 million reduced by a program reduction of $222 million.

Chairman PROXMIRE. So you concede that there is that $1.2 billion increase in cost involved?

Admiral SMITH. That is what is contained in our report.

INFLATION FACTOR

Chairman PROXMIRE. And here in making this breakdown you say $411 million in the last components was the result of inflation?

Admiral SMITH. To the best of my ability to estimate it.

Chairman PROXMIRE. How much of a precise estimate is this? Is this based on a study of the increase in wage costs, the increase in materials costs, and so forth, or is this just a generalized figure that you applied?

Admiral SMITH. No, it is based on a study, and I will agree that making such a study in complete depth is very difficult and a long process but it is a study as much as we can make during this time.

Chairman PROXMIRE. The original estimate included an allowance for inflation; did it not?

Admiral SMITH. Specifically it allowed 3 percent.

Chairman PROXMIRE. And there has been how much inflation?

Admiral SMITH. And this computes out to be 4½ percent, not additional.

Chairman PROXMIRE. Annually, per year?

Admiral SMITH. Per year.

Chairman PROXMIRE. Who are the prime contractors for Poseidon?

Admiral SMITH. The missile is the Missile and Space Division of Lockheed Aircraft Co. The fire control is the Ordnance Division of General Electric. The launcher is Marine Division of Westinghouse. The guidance, the gimbal assembly Ordnance Division of GE; and the electronic assembly is Raytheon. The navigation is Sperry, Sperry Rand, I forget the division now, and modification of SINS is Autonetics Division of Rockwell, North American Rockwell.

Chariman PROXMIRE. Which is the, which of these contractors has the largest share of the total amount, total cost?

Admiral SMITH. Lockheed with the missile.

Chairman PROXMIRE. Lockheed. What proportion of the total cost does that represent, 50 percent, 30 percent?

Admiral SMITH. I had better furnish this but I would say of the order of 30 percent or something like that.

Chairman PROXMIRE. All right, furnish that for the record.

(The data follows:)

The portion of Poseidon program cost, as reported in the Selected Acquisition Report of 30 September 1969, that is identifiable with Lockheed Missiles and Space Company, is approximately 49 percent.

COSTS OF NUCLEAR WARHEADS CLASSIFIED

Chairman PROXMIRE. The Navy's SAR for Poseidon does not include the costs of the nuclear warheads. Why not?

Admiral SMITH. To the best of my knowledge, none of the SAR reports include any costs of another agency of Government.

Chairman PROXMIRE. Why not? Couldn't you procure these from the Atomic Energy Commission?

Admiral SMITH. No; they are separately budgeted by the Atomic Energy Commission.

Chairman PROXMIRE. I know they are separately budgeted. But why aren't they available to you?

Admiral SMITH. They are not really made available to me. The processes that we develop——

Chairman PROXMIRE. Do you know those costs?

Admiral SMITH. We develop and manufacture the re-entry body shell and the arming and fuzing system, we furnish those to AEC. AEC assembles the reentry bodies, and then furnishes to the custodian, which in this case is the operational commander.

Chairman PROXMIRE. Do you know what those costs are for the warheads?

Admiral SMITH. I don't know precisely; no.

Chairman PROXMIRE. Do you know whether they have gone up or not, whether they have risen, whether there has been a growth here?

Admiral SMITH. No; I don't know.

Chairman PROXMIRE. Wouldn't these costs substantially increase the costs of the total program if they were known?

Admiral SMITH. Yes. They are known and in some of the reports to the Congress by the Secretary of Defense, I have seen figures that apparently include them.

Chairman PROXMIRE. Can you get those for us, supply them for the record?

Mr. SANDERS. We will attempt to supply this data, sir.

(The data follows:)

DEPARTMENT OF THE NAVY,
Washington, D.C., February 2, 1970.

HON. WILLIAM PROXMIRE,
Chairman, Subcommittee on Economy in Government, Joint Economic Committee, U.S. Senate, Washington, D.C.

DEAR SENATOR PROXMIRE: Thank you for your letter of appreciation of 8 January regarding my 31 December 1969 appearance before your subcommittee.

As you know, all of the inserts for the record promised by the Navy witnesses during the above hearing have been provided to your staff except the costs of the nuclear warhead promised on page 1399 of the hearing's draft transcript.

By the attached letter of 26 January 1970, responding to my letter of 7 January 1970, the Atomic Energy Commission has advised that the Poseidon warhead cost information cannot be provided on an unclassified basis. Further, I have been unable to ascertain any previous unclassified disclosure of costs for the entire Poseidon system which include the warhead costs. However, should you desire to receive the classified information I would be happy to forward it to you under the normal security conditions and procedures involved in the handling of such data.

Sincerely,

FRANK SANDERS,
Assistant Secretary of the Navy,
(Installations and Logistics.)

Attachment.

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., January 26, 1970.

HON. FRANK SANDERS,
Assistant Secretary of the Navy (Installations and Logistics) Department of the Navy, Washington, D.C.

DEAR MR. SANDERS: In reply to your letter of January 7, 1970, to Chairman Seaborg, requesting cost information for the Poseidon warheads, we are unable to provide this information on an unclassified basis.

Cost information for nuclear materials, research and development, test, construction and equipment, and production and surveillance is classified when identified on a weapons system basis. This classification restriction applies to these costs individually and in total either on a per weapon (unit) basis or for the weapons system in total.

In addition, the term used to identify the alternative Poseidon warhead design (which was later replaced by the present design) is in itself classified in that it provides nuclear weapons design information.

Should you so desire we would be most pleased, commensurate with established security procedures, to forward the requested cost information in a separate classified letter.

Sincerely,

HERMAN E. RESOR,
(For Edward B. Giller,
Major General, USAF,
Assistant General Manager for Military Application).

COSTS OF REPLENISHMENT SPARES

Chairman PROXMIRE. If you can't get them we will go after them and see if we can get them. The Navy's figures do not also include the cost of replenishment spares; is that correct?

Admiral SMITH. That is correct.

Chairman PROXMIRE. Why not?

Admiral SMITH. The instructions for the earlier SAR's were to include all procurement costs and for the later SAR's were that the original estimate or contract definition estimate and the current estimate were to be limited to acquisition costs not including replenishment spares or operation and maintenance.

Chairman PROXMIRE. What is the reason for that? The spares are just as important a part of the operation as warheads. You can't operate without the spares.

Admiral SMITH. I can't speculate. It does include the initial spares. It can be operated.

Chairman PROXMIRE. We found on the C–5A, for example, that these spares accounted for a very large proportion of the costs and we had a dispute with the Air Force for months before we finally found the real differences were they were not including the replenishment spares and we were, and when we got that ironed out we were on consistent ground on the figures.

Admiral SMITH. I can only speculate that the reason is that you have a rather indeterminate region to compare it with unless you specify a period of time in which this system is to be operated.

Chairman PROXMIRE. Well, you can make estimates as to these spares, get those figures.

Admiral SMITH. The estimate has to be based on some specification of the period of time in which the system is to be operated and supported.

Chairman PROXMIRE. Do you have any current estimate of what the replenishment spares will cost?

Admiral SMITH. Yes, we have——

Chairman PROXMIRE. What is that figure?

Admiral SMITH. I don't have it at my fingertips.

Chairman PROXMIRE. Approximately?

Admiral SMITH. I don't think I had better give it.

Chairman PROXMIRE. Will you give it to us for the record?

Admiral SMITH. Yes, sir.

(The data follows:)

POSEIDON replenishment spares are currently estimated to cost $89.2 million through FY 1975.

The original estimate of POSEIDON costs, as reported in the 31 March 1969 Selected Acquisition Report, included $6.2 million for replenishment spares through FY 1972. If extended through FY 1975 this estimate for the Contract Definition Plan would total $90.9 million. The Current Estimate of POSEIDON costs reported in the 31 March SAR included $70.3 million for replenishment spares through FY 1974, which if extended through FY 1975 would have totaled $89.6. An explanation of operating and support costs that were included in the 31 March 1969 SAR but eliminated from the 30 September 1969 SAR was attached to the latter report.

POSEIDON PLANNING ESTIMATE NOT PROVIDED IN SAR

Chairman PROXMIRE. On Monday the General Accounting Office told us they could not obtain the planning estimated cost of this program for the Navy, couldn't get it. Of 33 Navy programs summarized for us, Poseidon is one of only three on which planning estimates were not given. Why not?

Admiral SMITH. The planning estimate was not given in our SAR, I don't know that everyone treated it the same way because at the time of approval, November of 1963, to go ahead with contract definition, there was not a requirement to compute such a figure.

Chairman PROXMIRE. Was not a requirement for what?

Admiral SMITH. To compute such a figure.

The current instructions with regard to contract definition are that there be an estimate of total program cost before approval of contract definition as one of the prerequisites for approval. As I interpret it, this is one of the considerations in deciding whether to spend the money for contract definition.

Chairman PROXMIRE. In this case, however, you are telling us that no planning estimate was made, at least in your office?

Admiral Smith. That is right.

Chairman PROXMIRE. Would you agree that if the planning estimate were substantially lower then the figure given for contract definition and the amount of cost overrun would appear to be substantially higher?

In other words, if the planning estimate were lower then the overall cost increase obviously would be higher, I mean that follows logically, isn't that true? You wouldn't dispute that.

Mr. SANDERS. Yes, that follows.

Admiral SMITH. But the purpose of those planning estimates is really to make a decision as to whether or not to invest in contract definition. As I note in my statement the cost of contract definition, which is really a set of tradeoffs to arrive at a general design, not quite as complete as a preliminary design, of the system, the cost for that contract definition in the case of Poseidon was $30 million. I would presume that the general considerations that you mentioned earlier of the advantages of increased capability in the Poseidon or the Polaris were sufficient to convince the Secretary of Defense to invest that much.

Chairman PROXMIRE. I don't want to seem to be excessively skeptical, but it appears, at least there is one possibility, that the planning estimate was withheld to conceal the true amount of the overrun. In other words, the planning estimate is lower, and they are in many cases here, the planning estimate is lower than the contract definition in most cases——

Admiral SMITH. I think this is quite understandable.

MCNAMARA MADE COST ESTIMATE IN 1967

Chairman PROXMIRE. Then the overrun would have been substantially higher.

Let me make my point by doing this, I want to read to you from former Secretary McNamara's statement in testimony given before the Armed Services Committee on January 25, 1967. Secretary McNamara said, and I read: "Although the cost of converting a submarine to Poseidon or procuring new missiles and of 10 years of operations is about half again as much as that of operating a Polaris submarine for 10 years, the effectiveness of the Poseidon submarine is several times greater." Then he goes on to say "The total incremental cost of developing Poseidon, and producing and deploying the proposed force is estimated at $3.3 billion. A total of about $900 million is included in the fiscal year 1968 budget for Poseidon," and so forth.

Now, let me read the question from, the answer to a question from, Senator Ellender when Secretary McNamara appeared before the Appropriations Committee. Senator Ellender asked him the cost per submarine, and Secretary McNamara went on to say "Carrying 16 missiles the total cost, total cost for the whole program, would be on the order of $3.3 billion for 31 submarines."

Now, wasn't this figure really a planning estimate that was made as early as 1967, and if we use this figure the amount of the overrun appears to be not $1.2 billion but $2.3 billion, doesn't it? We are going to the Secretary of Defense and we can't go to a higher authority.

Admiral SMITH. As early as 1965, the contract definition planning estimate, which is a planning estimate based on the results of the preliminary designs carried out during contract definition, was made available to the Secretary of Defense. The decision to recommend to the President the development and intention to produce was made after that, and as far as I know were based on the numbers we included in our report. That was 1965.

Chairman PROXMIRE. The Secretary's testimony before the Defense Appropriations Committee in 1967 was $3.3 billion, and he was talking about the same program, that is 31 ship conversions, was he not?

Admiral SMITH. I don't know. But I did note that in an earlier testimony that you quoted there was a statement of the increase over the cost of operating requirements. We did make computations of the expected number of A–3 missiles that would need to be bought to end of life of those missiles and furnished that information to the Systems Analysis Group of the Office of the Secretary of Defense.

Chairman PROXMIRE. Why didn't you give us the $3.3 billion planning figure? This was the figure the Secretary of Defense had used, this was available, this was public knowledge, this was in the record

but it was not given to us when we asked for the history of this program so we can plot what the increased costs are.

Admiral SMITH. I don't know what that figure was for or how it was computed. I would accept as it was stated that it was a computation having to do with 31 submarines.

Chairman PROXMIRE. Well, Secretary McNamara has become a very controversial figure in retrospect and people agree or disagree on his policies, but I think all of us agree he was a man of enormous capability who was very careful with his figures and rarely if ever was he shown, on a figure on this kind of an estimate, was he in error. He said $3.3 billion for the whole program in January of 1967, that was his estimate, an estimate that was available.

Admiral SMITH. I do know that the contract definition figure——

Chairman PROXMIRE. And you were on the program.

Admiral SMITH. Yes, sir. We furnished contract definition estimates to the Secretary of Defense and they are the figures that are included on the face of the SAR.

SHILLITO COST ESTIMATE

Chairman PROXMIRE. Last May I asked Secretary Shillito for some figures on the Poseidon program. Secretary Shillito's figures, which are dated as of March 31, 1969, are quite different from the ones provided by the Navy. The outstanding difference is the fact that in Secretary Shillito's report, he has a current estimate for the total program of $6.991 billion, almost $7 billion. In addition, Shillito's figures are for 30 submarine conversions, rather than 31, and his figures project the cost of the program through fiscal year 1974, while your costs are projected through fiscal year 1976. Thus, his figures for one less submarine and 2 less years are almost $2 billion higher than yours.[1] How do you explain these differences?

Admiral SMITH. I don't recognize the figures but I do know that the SAR that was submitted at the end of March, as of the end of March, included all of the operating costs for that period of time, and the replenishment spares. It was a higher figure.

Chairman PROXMIRE. Well now, this document comes from the Office of Secretary Shillito and it is dated the 31st of March 1969, for research, development, so forth, for R.D.T. & E., a total of $1.818 billion; for production, $5.173 billion; and it adds up, as I say, to just under $7 billion. There is a footnote which says "Defined as completion of current approved program, that is, through fiscal year 1967," Secretary Sanders.

Mr. SANDERS. Mr. Chairman, obviously there is some lack of communication concerning these two sets of figures. Could we clarify it not only for the record but also personally see that you and your staff are informed?

Chairman PROXMIRE. Well, I wish you could try to clarify it for the record here to the extent that you can.

Mr. SANDERS. We are at a complete loss on the figures for the moment.

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[1] "The Poseidon Program Status Paper," provided by Barry J. Shillito, Assistant Secretary of Defense (Installations and Logistics), is on p. 274.

Poseidon Cost Overrun

Chairman Proxmire. Now, if we take Secretary McNamara's 1967 planning estimate of $3.3 billion, $3.3 billion for the planning estimate given to the Appropriations Committee 1967 compared to Secretary Shillito's estimate of about $7 billion we end up with a cost overrun of $3.6 billion, three times the amount of the figures provided by the Navy. Would you care to comment on this?

Mr. Frosch. I would love to comment on it generally, not on that specific figure.

Chairman Proxmire. Yes. Comment generally if you wish and then we will get into it—we would like to comment incidentally on the figure first if you can give that to us.

Mr. Frosch. Well, I don't think you know where either the low figure or the high figure you are quoting came from.

Chairman Proxmire. I told you. It came from the Secretary of Defense and it came from Mr. Shillito.

Mr. Frosch. We would have to look at where they got those figures and analyze them to tell what they mean because they—I don't recognize either one.

Chairman Proxmire. You recognize both are highly responsible men, Mr. Shillito is still in the Defense Department, Mr. McNamara was Secretary for many years, and they must have gotten it from the Navy. There was no other source.

Mr. Frosch. Not necessarily. They may have been computing on an entirely different base. That is the point of my general comment.

If a projects engineer comes into my office and says "I can build you something for a million dollars" that is the original planning estimate. But the only decision I make on that basis is "that sounds like a very interesting thing. You may have $50,000 to go away and improve it."

Chairman Proxmire. Now, Secretary McNamara came to the Appropriations Committee and was asked the cost of the program. He said in his judgment the cost of the program would be $3.3 billion.

Mr. Frosch. Mr. Chairman, I don't——

Chairman Proxmire. I didn't say somebody walked into my office and said what he thought he could build it for.

Mr. Frosch. Mr. Chairman, I don't know what program he is talking about.

Chairman Proxmire. Thirty-one conversion submarines.

Mr. Frosch. How many missiles purchased and how many warheads in the MIRV and which particular navigation system and so on. This was a program.

Chairman Proxmire. Total program. We haven't seen that there has been any departure in these respects.

Mr. Frosch. This was a program which had just gone through contract definition. It had not yet been in development if I understand the dates correctly.

Chairman Proxmire. That is what planning estimates are for, to compare so we have some notion of the growth in cost and so we can get at, begin to get at, inefficiencies and wastes and mistakes and so forth, correct?

Mr. FROSCH. Mr. Chairman, you are suggesting that every error in a planning estimate that is made at some state in a program and told to somebody else, which later becomes a higher number, is the result of waste and inefficiency.

Chairman PROXMIRE. I am not assuming that at all, sir.

Mr. FROSCH. I don't think that is true.

Chairman PROXMIRE. I agree there would be justifications for these things, you make changes and you should make changes. You wouldn't be doing your job if you don't in some cases. As Secretary Sanders points out in his statement, he says there could be changes in the technology of the military development which make it necessary to make changes in a weapons system as it proceeds and it would be unwise not to make the changes. But we are asking for justification when those changes are made.

What we are getting at, however, are estimates from the best authorities we can find, the Secretary of Defense, and the Assistant Secretary in charge of procurement, and we are giving you those estimates and we are asking for an explanation and you say you don't have them as to how that differs from your own estimate. You estimate an increased cost, an overrun or cost growth, whatever you want to call it, of $1.2 billion on Poseidon, and our estimate is $3.6 billion three times as much.

Mr. FROSCH. Mr. Chairman, what we are saying is that you have given us a total number that was given to the Congress at one day, and another total number that was given to the Congress at another day.

Chariman PROXMIRE. Of course.

Mr. FROSCH. And unless we have the details on which those numbers were constructed we cannot possibly explain them so we will have to go back and look at them.

Chairman PROXMIRE. No. 1, we are trying to give you the planning estimate and then we are trying to give you a later figure, which is, of course, a later figure of what the current estimate is at the present time. In 1967, the Secretary of Defense was convinced this was a $3.3 billion program.

Now, the Assistant Secretary in charge of procurement seems to be convinced that on the basis of the latest testimony it is a $7 billion program.

Mr. FROSCH. And you would quite rightly like an explanation?

Chairman PROXMIRE. Right.

Mr. FROSCH. All I am saying is we cannot construct the explanation without knowing the details of where those two numbers came from.

Chairman PROXMIRE. All right. That is fair enough. Let's get that explanation as soon as you can for the record.

(The data follow:)

In the statement of the Secretary of Defense before the Committee on Armed Services and the Sub-committee on Department of Defense of the Committee on Appropriations, 25 January 1967, the total incremental cost of developing POSEIDON, and producing and deploying the proposed force, is estimated at $3.3 billion. In the estimates for developing and producing the POSEIDON weapon system presented by the Assistant Secretary of Defense for Installations and Logistics last summer, the total cost was given as $6.9 billion.

The former estimate was not developed in the Department of the Navy, so its composition cannot be certified by the Navy. However, it is known that the esti-

mate was prepared for the Secretary of Defense by his System's Analysis Office. Based on discussions with personnel of that office shortly after the statement was made and again recently, some clarification can be offered.

It is understood that System's Analysis used as a base for their calculation Navy's Program Change Request submitted in October 1966 which stated POSEIDON acquisition and operating costs through FY 1972 (this is the amount $5152M shown as the "original plan" in the 31 March 1969 SAR). To this, it is understood, was added the cost of completing the acquisition and the estimated cost to operate the POSEIDON for an additional five years.

This amount can be derived to have been $9.9 billion from the following two sentences in Secretary McNamara's testimony—"Although the cost of converting a submarine to POSEIDON, of procuring new missiles, and of ten years of operation is about half again as much as that of operating a POLARIS submarine for ten years, the effectiveness of the POSEIDON submarine is several times greater. The total incremental cost of developing POSEIDON, and producing and deploying the proposed force is estimated at $3.3 billion."

Adding "half again" to the $6.6 billion ten year operation and maintenance cost of the POLARIS system, as deduced from the above statement, would equal the total $9.9 billion cited above. Except for approximately $1 billion of the $6.6 billion (for 650 POLARIS A–3 missiles for the 1968–1978 period to replace those which had been manufactured during the period 1964–1968), the POLARIS and POSEIDON operating costs are estimated to be essentially the same for a ten year period. Thus, subtracting the expected POSEIDON operating and maintenance costs of approximately $5.5 billion from the $9.9 billion program acquisition and operating and maintenance costs cited by Mr. McNamara would result in a POSEIDON acquisition cost of $4.4 billion which is essentially the same amount reported in the 30 September 1969 SAR as the contract definition planned cost.

The estimate of $6.991 billion used by Secretary Shillito last summer was the current estimate for acquisition of the POSEIDON system and its operation through FY 1974 as reported in the POSEIDON SAR for 31 March 1969. Except for about $100 million to complete acquisition and except for including operating costs for a shorter period of time, (i.e. 5 years versus 10 years) this estimate can properly be compared with the estimate of $9.9 billion derived from Secretary McNamara's statement because they both include acquisition and operation and maintenance costs.

In accordance with instructions received from the Secretary of Defense, the 30 September 1969 SAR was prepared to include only acquisition costs (i.e. excluding operating and maintenance costs).

The cost of the POSEIDON program as shown under the CURRENT ESTIMATE column of the Program Status Report, changed between the 31 March 1969 and the 30 September 1969 Program Status Reports as a result of the revised reporting directives and definitions and because of more recent cost information. The 31 March CURRENT ESTIMATE of $6,991 million was reduced $1,863 million to reflect deletion of operating and support costs and for R&D projects not required to meet POSEIDON objectives; $523 million was added to show the full cost of program acquisition including military construction and range instrumentation ship costs previously excluded, and revised missile guidance costs. These changes brought the total to the $5,651 million current estimate in the 30 September program status report. Additional information relating to differences between the 31 March and 31 September reports was provided with the latter report as well as in the cost variance analysis report.

Costs of Nuclear Cores

Chairman Proxmire. As you know, Mr. Secretary, Admiral Rickover, who is the father of nuclear-powered ships, is in charge of providing nuclear cores for all Navy nuclear submarines. The first nuclear core for the *Nautilus* cost $4 million and lasted 62,000 miles. The second nuclear core cost $3 million and lasted 90,000 miles. The nuclear cores for the Poseidon are costing $3.5 million and will last 400,000 miles. In other words, the costs of nuclear propulsion under Admiral Rickover have actually gone down, while everything else in

the Navy seems to be going up. I think this is an interesting contrast and I wonder if you would care to comment on how it is that the costs of the Poseidon have skyrocketed while the costs of the nuclear cores have gone down?

Mr. SANDERS. I am neither a skilled expert in nuclear propulsion, the cost of nuclear components, nor in the technical problems of Poseidon. Dr. Frosch may have a little more information on this and I do know——

Chairman PROXMIRE. I don't mean it as any reflection on you.

Mr. SANDERS. Thank you.

Chairman PROXMIRE. I mean to say costs can go down, they don't always have to go up.

Mr. FROSCH. Of course not.

Chairman PROXMIRE. Here is a good example of an extraordinarily able man who has been able to get good results in reducing costs.

Mr. FROSCH. I entirely agree with that but please note what you are talking about is taking a basic piece of engineering equipment, the nuclear reactor, and its core, and making a series of incremental changes in that reactor so that you can pick up improved pieces of technology and put them in one by one and gradually make an improvement in cost and efficiency.

Chairman PROXMIRE. Exactly. And we want that to be done elsewhere.

Mr. FROSCH. But if we needed to make a major change or wanted to make a major change in nuclear reactors so that we had to go to a new design and a new concept completely, then it isn't clear that the cost would go down initially, major technology.

Chairman PROXMIRE. You are not implying that an improvement from 90,000 to 400,000 miles is not a major change?

Mr. FROSCH. It resulted in a major change but it is not a complete redesign of the whole reactor and whole reactor concept and all auxiliary machinery and done as an incremental improvement change. I think Admiral Rickover would agree with that.

NAVY PLANS NO POSEIDON SHOULD-COST STUDY

Chairman PROXMIRE. Let me ask, has the Navy made any plans to do a "should cost" study of the prime contractors on the Poseidon?

Mr. SANDERS. At the present time the Navy has not made any such plans.

Chairman PROXMIRE. In view of the huge cost overruns, do you think a "should cost" study is in order?

Mr. SANDERS. We have nothing in production. This is a basic problem.

Chairman PROXMIRE. You are very close to production according to the schedule Admiral Smith gave us; you expect the first conversion to be accomplished within a few months, is that correct?

Admiral SMITH. We expect the first production missile to be delivered about 8 months from now.

Chairman PROXMIRE. Right.

Admiral SMITH. First.

Chairman PROXMIRE. Well, it would seem to me this is a good time to initiate a "should cost" study.

Nuclear Carrier CVAN-69

The Navy's SAR report on the nuclear carrier CVAN-69 does not include a current estimate for the total program. Why not?

Mr. Sanders. I will have to see if we have the answer to that. I do not.

Admiral Sonenshein. I believe our latest SAR does. The September 30 issue.

Chairman Proxmire. Well, the latest one made available to this subcommitee?

Admiral Sonenshein. Yes; we can make it available to you. I am sure it does.

Chairman Proxmire. What is the name of this carrier?

Admiral Sonenshein. The first carrier is the *Nimitz*. The second and third have not yet been named, sir.

Chirman Proxmire. What is that, sir?

Admiral Sonenshein. The second and third have not been named.

Chairman Proxmire. And the first carier is what?

Admiral Sonenshein. *Nimitz*.

Chairman Proxmire. *Nimitz*.

In view of the fact that every other carrier built in recent years has involved large cost overruns, would you say that it was likely for the CVAN-69 to follow the pattern?

Admiral Sonenshein. Well, that is a speculation that I can't comment on. I will say this, that we just within the past week commenced negotiations with the prospective—with the shipbuilder to definitize our contract. We expect to complete that negotiation in about a month and at that time we will know the basic construction cost for the *Nimitz*, and from that we will be able to project the basic construction costs for Nimitz II and Nimitz III, the unnamed carriers, and then we will be in a position to comment on your question.

Carrier "Midway"

Chairman Proxmire. Can you tell us what the original cost estimates for conversion of the carrier *Midway* were and what the final costs were?

Admiral Sonenshein. Yes, sir. The initial estimates for the *Midway* were on the order of $80 million. The current estimate to complete is about $204 million.

Chairman Proxmire. I didn't get that last, $204 million for what?

Admiral Sonenshein. About $204 million.

Chairman Proxmire. For converting the *Midway?*

Admiral Sonenshein. Correct, sir.

Chairman Proxmire. So it went from $80 million to $204 million?

Admiral Sonenshein. That is correct, $81 million was the original.

Chairman Proxmire. Is it true that the costs to convert the old *Midway* were close to the costs of constructing the last conventional carrier; the *John F. Kennedy?*

Admiral Sonenshein. The cost to construct the *Kennedy* is on the order of $277 million.

Chairman Proxmire. So they were fairly close, conversion $220 million and construction from scratch $270 million?

Admiral SONENSHEIN. Of course, there are different time frames involved. These are not in constant dollars.

Chairman PROXMIRE. What is the time frame?

Admiral SONENSHEIN. The *Midway* is not quite completed. She will complete this June or this fall rather. *Kennedy* was completed about a year ago so there is some difference, a small difference.

Chairman PROXMIRE. Time frame then is a minor consideration. The *Midway* costs might go up even higher.

Admiral SONENSHEIN The information I have does not indicate that, sir.

Chairman PROXMIRE. Which shipyard did the work on the *Midway?*

Admiral SONENSHEIN. The work is underway at the San Francisco Bay Naval Shipyard, Hunters Point Division.

NEWPORT NEWS SHIPBUILDING AND DRYDOCK CO. MONOPOLY ON ATTACK NUCLEAR CARRIERS

Chairman PROXMIRE. It is true that Newport News Shipbuilding and Drydock Co., now owned by the conglomerate Tenneco, has an absolute monopoly on the construction of attack carriers?

Admiral SONENSHEIN. The Newport News Shipbuilding and Drydock Co. is the only shipbuilding company in the country that can construct nuclear-powered attack carriers.

Chairman PROXMIRE. So it has a monopoly because it is the only one that has a capability, is that right?

Admiral SONENSHEIN. Yes, for nuclear attack carriers.

NO SHOULD-COST STUDY OF NEWPORT NEWS PLANNED

Chairman PROXMIRE. Does the Navy plan to do a "should cost" study of Newport News?

Admiral SONENSHEIN. We don't have plans for doing what has been described here this morning as a complete "should cost" study.

Chairman PROXMIRE. Well, considering the fact that all their carriers involve large cost overruns, don't you think it would be appropriate to do a should-cost study?

Admiral SONENSHEIN. With regard to the current carrier that I described as now being under negotiations we have components of "should cost." We have constructed an independent cost estimate from the keel up for building that ship and we will use that estimate in our negotiations. We have also made many management analyses of the company's internal operation. Further, we have at Newport News on a full-time basis a staff of some 450 people consisting of some 35 military and some 415 civil service personnel who are our contract administration organization. They are called our Supervisor of Shipbuilding Office, and they are there on a full-time basis. They inspect, they observe, they audit, they analyze, so we have a continuous monitoring of the project as it goes through its entire phase.

MARK–48 TORPEDO PROGRAM

Chairman PROXMIRE. I would like to ask about the Mark–48 torpedo program. According to the Navy's SAR report, it has a cost overrun of over $3 billion. However, it is designated in our summary

as "Mark-48-MOD-0." Isn't it true that in addition to model 0, model 1 of this program is now also under development?

Mr. SANDERS. This is correct, sir.

Chairman PROXMIRE. Can you give us the figures for model 1?

Mr. SANDERS. Let me see if we have it. Captain Freeman, do you have that data?

Captain FREEMAN. We have the Mark-48 MOD-1 September 30 total estimates of the current program are $132.7 million.

Chairman PROXMIRE. What figure is that again?

Captain FREEMAN. That is the current estimate of total program.

Chairman PROXMIRE. What was the planning estimate for that model 1?

Captain FREEMAN. The planning estimate that I have is based on June 30 and the only figures I have here are for September 30, and these were gathered quickly, as you are aware, Mr. Chairman, this morning. The planning estimate figure I show is $70.7 million.

Chairman PROXMIRE. $70.7 was the planning estimate?

Captain FREEMAN. Yes, sir.

Chairman PROXMIRE. And the current estimate is $100——

Captain FREEMAN. $132.7 million.

Chairman PROXMIRE. $132.7 million.

Do you have anything on the contract definition figure?

Captain FREEMAN. The contract definition figure is $71.6 million.

Chairman PROXMIRE. $71.6. And the initial planning?

Captain FREEMAN. $71.6.

Chairman PROXMIRE. All right, sir.

I understand that the model 0 portion of the program contained a unique unit cost of production incentive contract provision. Under this provision, as I understand it, if the contractor met a certain low unit cost in the development phase, he would receive an incentive fee of $5 million. Can you tell us what the initial unit cost goals for this program were?

Captain FREEMAN. I don't believe I have that information. Were you talking about, Mr. Chairman, incentive contract? It was a fixed-price incentive contract for the Mod 0.

Chairman PROXMIRE. What was that?

Captain FREEMAN. It was a fixed-price incentive contract for the Mod 0 torpedo. I am not personally aware of the other incentive provisions of the contract which we will be glad to review and get that for the record.

Chairman PROXMIRE. Will you get it?

Captain FREEMAN. Aye, aye, sir.

(The data follow:)

The Mk 48 Mod 0 Torpedo/Mk 27 Torpedo Target Fixed Price-Incentive Development Contract contained the following incentives:

(1) An incentive on contract cost with a target price, a ceiling price and 80/20 share line for contract cost with a target price. The ceiling price limited Government liability to that price except that upward adjustment was permitted for payment of unit cost of production, reliability, performance and/or milestone incentive awards.

(2) In the Mk 48 Mod 0 Torpedo development contract an incentive was established on "Unit Cost of Production". This incentive established a target goal for the raw cost of material and direct production labor exclusive of IR&D, G&A and Profit of $75,000 for the average warshot torpedo in the last one-fourth

of the 85 production prototype torpedoes. The goal was based on a Contractor estimate of $79,000. This incentive called for a $1.0M incentive payment if the target cost was achieved, a maximum incentive of $5.0M if the unit cost was reduced to $63,750 and $0.0 if the unit cost exceeds $82,500. It is important to recognize that the incentivized "Unit Cost of Production" excluded all production costs except direct material and production line labor cost for warshot torpedoes. When IR&D, G&A and Profit rates alone are applied, the $79,000 contractor unit-cost-of-production estimate equates to a unit price estimate of $120,000 at 1964 dollars. Note that the effects of inflation since 1964 are not included in this "price estimate." Furthermore, this unit price cannot be directly related to planned procurement unit price estimates which include the prorated price of quality assurance, configuration management, off-line environmental testing, production engineering, proofing hardware and support, warshot support (periodic maintenance) initial spares and training school hardware.

(3) An incentive was established on reliability as demonstrated by production prototype torpedoes for improvement over a lower reliability limit of 80% with a 0.80 confidence level to a maximum incentive payment at 95% reliability at a rate of $70,000 for each one full percent increase in reliability.

(4) Performance Incentive—Three measures of torpedo performance were established for incentives, these are:

(a) Radiated noise—Incentive computation was established at the rate of $150,000 for each decibel reduction in torpedo radiated noise, below the specification, demonstrated by production prototype torpedoes.

(b) Torpedo endurance—Incentive computation was established for incremental improvements in torpedo endurance over specification at specified speeds and depths with a maximum incentive payment of $625,000.

(c) Acoustic Improvement—Incentive computation was established for improvement in acoustic performance over the specified minimum performance to a maximum incentive payment of $265,000.

(5) Milestone Incentives—Incentives were established on improvement of scheduled delivery of each of the three lots of production prototype torpedoes and torpedo targets, for a maximum incentive of $420,000.

Chairman PROXMIRE. Will you answer this: Is it not true that the unit cost target was $75,000 each and that the incentive goal was $65,000 each?

Captain FREEMAN. I couldn't answer that.

Chairman PROXMIRE. Supply that for the record.

(The data follow:)

In the Mk 48 Mod 0 Torpedo development contract an incentive was established on "Unit Cost of Production". This incentive established a target cost goal for the raw cost of material and direct production labor exclusive of IR&D, G&A and Profit of $75,000 for the average warshot torpedo in the last one-fourth of the 85 production prototype torpedoes. The goal was based on a Contractor estimate of $79,000. This incentive called for a $1.0M incentive payment if the target cost was achieved, a maximum incentive of $5.0M if the unit cost was reduced to $63,750 and $0.0 if the unit cost exceeds $82,500. It is important to recognize that the incentivized "Unit Cost of Production" excluded all production costs except direct material and production line labor cost for warshot torpedoes. When IR&D, G&A and Profit rates alone are applied, the $79,000 contractor unit-cost-of-production estimate equates to a unit price estimate of $120,000 at 1964 dollars. Note that the effects of inflation since 1964 are not included in this "price estimate". Furthermore, this unit price cannot be directly related to planned procurement unit price estimates which include the prorated price of quality assurance, configuration management, off-line environmental testing, production engineering, proofing hardware and support, fleet training exercise hardware and support, warshot support (periodic maintenance) initial spares and training school hardware.

Chairman PROXMIRE. Is it possible that the current estimated unit costs are closer to $500,000 each?

Captain FREEMAN. For the MOD 0?

Mr. FROSCH. It depends on how many are included in the buy.

Chairman PROXMIRE. It appears to be an enormous increase in cost from the original estimate. At any rate can you give us those figures?

Mr. FROSCH. Yes.

(The data follow:)

Current estimated "unit price," on the same basis as the 1964 estimated $120,000 warshot torpedo hardware production unit price is $391,000 for a very small initial production run. Part of this increase is attributed to economic inflation since 1964. Another part of the increase is due to an underestimation of the scope of work involved in producing this sophisticated weapon. Still another reason for the increase is an imminent break in production line and production engineering continuity, on completion of the production prototype torpedo effort, such that learning benefit from production prototype torpedo effort is not expected to produce follow-on production cost benefit.

It should be noted that the production unit cost shown in the 30 September 1969 Selected Acquisition Report, $535,000, cannot be equated to the above price, since the unit cost is derived by totaling all contractor and non-contractor production costs including fire control equipment and initial spares, production and planned Mk 27 torpedo target and initial spares production as well as planned MK 48 torpedo and initial spares production and then dividing by the planned torpedo quantity. A more meaningful unit cost can be derived by totaling only contractor torpedo production costs with those non-contractor costs associated with torpedo and initial spares production and dividing by planned torpedo production quantity. Based on 30 Sept 1969 SAR, this yields a torpedo unit cost of $479,000, a price which includes all aspects of contractor and non-contractor production, warshot, proofing, initial spares and exercise hardware support.

Chairman PROXMIRE. This program was started in 1964, as I understand it. When was the first indication it was in trouble in terms of cost overruns?

Mr. FROSCH. Well, the first indication that I am aware of, problems in the development contract occurred, so far as I know, sometime in the spring of 1966 before I came into the Navy, because it was an early and lively topic of discussion when I first came in.

Chairman PROXMIRE. Yes, we have information that the Navy was told by one of its consultants, that is the Management Systems Corp., as early as 1965 that the costs were skyrocketing.

Mr. FROSCH. That could well be.

Chairman PROXMIRE. Do you have any information as to why the Navy didn't act upon it, act on it, or what the Navy did on it?

Mr. FROSCH. The Navy did act on it because I was directly and personally involved.

Chairman PROXMIRE. When? As I say this was 1965. You didn't come in until 1966.

Mr. FROSCH. I came in in 1966 and I was involved from then on. I can't speak of my own knowledge of what happened before then. This was an extraordinarily difficult situation because we had a fixed-price incentive contract for development with the manufacturer, and while we recognized there was trouble in the development program, we were faced with the very difficult choice of either convincing the contractor that certain things had to be done or of opening the contract up by taking Navy action, in which case we would automatically have opened ourselves to a claim because it was a fixed-price contract. So what we attempted to do, and finally, I think rather——

Chairman PROXMIRE. Who was the contractor?

Mr. FROSCH. The contractor is Westinghouse. What we did was take action during the late summer and fall of 1966 at the top of the Navy

in that the then Assistant Secretary of the Navy for Installations and Logistics and I, along with the Chief of Naval Material, went to the contractor, to the particular plant that was involved, and had meetings with the senior people in Westinghouse. The Secretary of the Navy discussed the problem with the president of the corporation, and Mr. Bannerman and I discussed the problem with the appropriate and responsible vice presidents and went through a great deal of discussion of what the technical problems might be, what the costing problems might be, and the scheduling problems and in particular some problems that were going on in the test program. As a result of several months of discussion considerable changes were made by the contractor in his program without reopening the contract.

LHA Program

Chairman Proxmire. This year the Navy awarded a $1.3 billion contract to Litton Industries for the ship known as the LHA. Wasn't the form of the contract a total package procurement?

Mr. Sanders. Captain Freeman.

Captain Freeman. Not in the classic definition of a total package procurement, Mr. Chairman, because there were certain elements of total package that are not included.

Chairman Proxmire. Speak a little more loudly into the microphone.

Captain Freeman. Excuse me. In the classical definition of a package procurement it was not because there were certain elements of spares and things of this nature which in a classical definition are normally included.

Chairman Proxmire. It may not be a classical but it was described as a package procurement.

Captain Freeman. Yes, sir; it was a package procurement.

Chairman Proxmire. Was this the first total package procurement contract of its kind awarded by the Navy?

Captain Freeman. For ships, yes. This is the first form of this type of contract that has been used in ship construction.

Chairman Proxmire. This is a huge contract, $1.3 billion. In view of the terrible experience we had with the C–5A, we think it was a bad experience, a $2 billion overrun in total package procurement, do you believe it was wise for the Navy to experiment with a new contract form on such a large program?

Captain Freeman. I will make one comment and I think Admiral Sonenshein has several comments. It is not a new contract form, a fixed-price incentive successive target.

Chairman Proxmire. You said you had not had this before.

Captain Freeman. In shipbuilding we had not normally used this form of contract but it has been successfully used in other large programs so that it isn't an unusual form of contract that we used.

Chairman Proxmire. Which programs? We were told it was brand new, invented by Secretary Charles of the Air Force. He wrote the book on it.

Captain Freeman. If you are addressing total package procurement, I am addressing the specific type of contract that was used to buy the ship.

Chairman PROXMIRE. In which programs was it successful?

Captain FREEMAN. We have used fixed-price incentive contracts in a number of successful programs.

Chairman PROXMIRE. Yes, but this was a package procurement program which you testified was the first one of its kind that you used in shipbuilding and I am asking you if there were other programs used elsewhere of this kind, and which ones were successful?

Admiral SONENSHEIN. Could I attempt to respond to that, please?

Chairman PROXMIRE. Yes, Admiral.

Admiral SONENSHEIN. I think it is important to recognize the basic kind of an operation we are talking about here and to recognize that it is not too much different from what prior shipbuilding acquisitions have used.

In ship acquisition we do not normally have a development period. We go from design into production. First the preliminary design, then the contract design, and finally working plans are prepared and then we start building ships, and this has been done in every ship acquisition we have had over the recent years. The unique feature here was that there was a contract definition formally conducted for the design process by competing firms, and that the winner of that contract definition then had the opportunity to design a ship and carry out its construction. So that the only different feature between this and what has been done in the past is the competition for the design and the program plans.

There is little development involved on our ship acquisitions, and this is true also with the LHA. There is no postdelivery responsibility for maintenance or support. It is essentially the same operation as in others except it is a multiyear procurement and there was competition for the design and the production contract.

PROGRESS PAYMENTS UP TO 100 PERCENT

Chairman PROXMIRE. Is it true that under recently revised procurement regulations you are now authorized to make progress payments of up to 100 percent of costs incurred. Previously the limit had been 75 percent and then it was raised to 90 percent. Now, you come up with a 100-percent progress payment, is that correct?

Captain FREEMAN. Progress payments of that nature, Mr. Chairman, are considered unusual progress payments and require a deviation from the ASPR.

Chairman PROXMIRE. It is unusual. Is it the fact that Litton is getting 100-percent reimbursement under its LHA contract?

Admiral SONENSHEIN. I think we have a special situation here, Mr. Chairman. For the first 40 months under this contract Litton is to receive progress payments not related to physical progress; in other words, cost reimbursements for the first 40 months. The situation that engenders this——

Chairman PROXMIRE. Of a hundred percent?

Admiral SONENSHEIN. Yes, sir.

Chairman PROXMIRE. 100 percent.

Admiral SONENSHEIN. This is a deviation from ASPR. The basic reason for doing this in this instance is that the ships will be built in

a new shipyard which is now being constructed at Pascagoula, Miss., and is not yet a going concern.

Chairman PROXMIRE. Who is constructing the shipyard?

SHIPYARD CONSTRUCTION FINANCED THROUGH STATE BANKS

Admiral SONENSHEIN. The shipyard is being constructed by the Litton Corp. and the basic financing is through industrial bonds issued by the State of Mississippi.

Chairman PROXMIRE. So Litton has got the State of Mississippi issuing industrial bonds and it has got the Navy providing a 100-percent progress payment. They don't have to put much of their money in the pot. We found in Lockheed you had a situation where Lockheed's plant was owned by the Government, $150 million of their equipment was owned by the Government, and they had a 90-percent progress payment so their investment was relatively small, and we are going to have a real problem, as you know, in the rest of the C–5A in view of the immense Federal commitment involved here, and the limited amount of Lockheed's ability to bale itself out.

Admiral SONENSHEIN. I think there is an issue of national interest involved here which I think should be recognized. This shipyard that is being constructed is the first new complete shipyard that will have been constructed in this country since World War II and it can be an important adjunct to our industrial base.

STEEL, NICKEL, AND FORGING SUPPLIES AND TRUTH-IN-NEGOTIATIONS ACT

Chairman PROXMIRE. Admiral Rickover has testified before this subcommittee that many of the largest steel companies, nickel producers, and forging suppliers usually do not provide cost data to the Government or to higher tier contractors as required by the Truth-in-Negotiations Act. What is the Navy Department doing to insure that these and other firms are complying with the law?

Mr. SANDERS. Mr. Chairman, I would like to be very specific on that. We had this arise early this year. We had a great deal of difficulty. We had no costing data. We made an all out effort in this area and we were very happy about 6 weeks ago to find out we had successively established competition.

PRACTICES AT PRIVATE SHIPYARDS

Chairman PROXMIRE. Let me ask this as specifically as I can. The Admiral, Admiral Rickover has also pointed out in testimony that poor subcontracting and poor cost control practices at private shipyards are a major reason for the price increases on Navy ships. He gave this subcommittee specific examples of poor procurement actions by Navy contractors and stated he had raised this issue with Navy officials. Would you please tell specifically—not in generalities—what the Navy has done to tighten up contractors' procurement practices since you came into office? I would like you to answer in detail—the name of the company, the specific problem, when the issue was raised, whether it has been resolved, and so forth.

Mr. SANDERS. I cannot answer that for the moment, sir; as to the specifics which you desire. In two major contractors' yards we have withdrawn consent to approval of contractors procurement systems which means that every subcontract above $100,000 must be now approved by the Navy. Captain Freeman, would you like to expand on that at all?

Chairman PROXMIRE. Why don't you expand on that for the record? I think that will be useful if you could. I don't want to detain you men too long, you have been very generous of your time. I have a few more questions that may take some time.

(The data follow:)

A number of specific actions have been taken to improve contractor procurement practices in the shipbuilding industry. These actions have been on two levels: (1) within the Navy, in strengthening the Navy's capability to review in depth shipbuilders' procurement practices, and in ensuring that such reviews are carried out vigorously; and (2) at the contractor level, in focusing attention specifically upon the major shipbuilders in the United States receiving the highest volume of Navy shipbuilding dollars under flexibly-priced prime contracts (i.e., fixed-price incentive, cost-plus-incentive-fee, and cost-plus-fixed-fee contracts).

STRENGTHENING NAVY SUBCONTRACTING REVIEWS

In regard to the first point above, in January 1969 personnel from my staff and the staff of the Chief of Naval Material began a review of subcontracting practices generally in the shipbuilding industry as a part of the SCN (Shipbuilding and Conversion, Navy) Pricing and Cost Control Study conducted under the direction of Rear Admiral Sonenshein with attention to the means available for Navy surveillance of these practices. Several actions grew out of this study, directly or indirectly. In order to ensure the vigorous prosecution of the Navy's already established Contractor Procurement System Review (CPSR) program (see ASPR 23-100), the Chief of Naval Material in June 1969 created a board to oversee in continuing fashion the results of all Navy CPSRs and to make recommendations appropriate thereto. At the same time, teams composed of personnel from my staff, CNM and COMNAVSHIPS have been conducting CPSRs scheduled to be accomplished for three major Navy shipbuilders. Special attention has been given to this effort to ensure that these reviews are comprehensive and that their conclusions are immediately placed at the disposal of Navy top management.

INCREASED USE OF THE SUBCONTRACT CONSENT PROCEDURE

Recognizing that "system" reviews cannot alone provide the detailed surveillance required of subcontracting, the Navy has emphasized the use of the subcontract consent procedure (see ASPR 23-200) in shipbuilding contracts. This has been done through (a) shifting to greater use of flexibility-priced prime contracts in shipbuilding, which provide the Government with greater audit rights and other controls than do firm fixed-price contracts; (b) ensuring the use of the subcontract consent clause in shipbuilding prime contracts; and (c) withholding approval of certain shipbuilder procurement systems where such action has been determined to be necessary. Under the consent procedure the contractor is contractually required to submit its proposed purchase orders over a certain dollar threshold in value (generally $100,000) for consent by the Navy prior to placement.

MAJOR RESULTS OF RECENT SUBCONTRACT REVIEWS

The major contractor deficiencies discovered during Navy subcontract reviews recently have been (a) a failure to perform adequate cost analysis (see ASPR 3-807.2(c)) prior to placement of noncompetitive subcontracts, a reflection of an apparent lack of cost analysis capability among shipbuilders generally, (b) failure to document purchase order files sufficiently to substantiate the reasonableness of prices paid, (c) inadequate emphasis on the Truth in Negotiation Act, and (d) inadequate use of competition in subcontracting. In each case the ship-

builders involved are taking corrective steps. They have acted to strengthen their cost analysis capability (e.g., by hiring cost analysts and establishing a separate cost analysis group within the Purchasing Department) and to improve purchase order file documentation (e.g., by developing a documentation checklist for purchase order files, standard negotiation resumes, and appropriate departmental procedures). Further, Navy teams have been conducting training sessions at shipbuilders' yards on the implementation of the Truth in Negotiation Act in prime contracts, for both Government and shipbuilder personnel. Finally, the inclusion in prime contracts of the subcontract consent provisions, discussed above, will permit increased emphasis by the Navy on the requirement for competition in subcontracting, where appropriate.

We intend to have follow-up reviews to ensure correction of deficiencies and continued progress toward improvement of shipbuilders' procurement practices. This will be a formal ongoing program under the direction of the Chief of Naval Material.

The Navy's subcontract review program has also brought to the attention of Navy top management a number of areas in which some clarification or strengthening of policy is needed. Recently a review team discovered, for example, that one shipbuilder was not obtaining Navy consent to subcontract prior to placing substantial orders for certain valves. The shipbuilder took the position that such consent was not contractually required since the valves were being acquired from an affiliate of the shipbuilder by the use of "work orders," and that therefore these transactions were not "purchases" within the meaning of the prime contract's consent clause. The Navy is currently taking action to ensure that such transactions, which are susceptible to profit pyramiding and cost build-up, receive thorough Navy review prior to consummation.

In another case a shipbuilder's purchase order file showed that the buyer had engaged in prolonged negotiation with a supplier of torpedo handling equipment resulting in a substantial price reduction. The file, however, failed to show the basis for the negotiations or for the price reduction achieved—e.g., whether it resulted from the deletion of certain items which the shipbuilder originally had felt were necessary or from a negotiated reduction in specific categories of cost or profit. Shipbuilder purchasing personnel were able to explain adequately what had occurred during the negotiations, which was quite satisfactory, but they saw no business reason or contractual requirement to document their explanation in the purchase order file. The Navy took the position that without appropriate file documentation major purchases could not be intelligently reviewed by either the shipbuilder's own management or responsible Navy officials. The Navy is currently taking steps to clarify formally the contractor's responsibilities concerning documentation of purchase order files and substantiation of the reasonableness of prices on subcontracts.

EXAMPLES OF USE OF THE SUBCONTRACT CONSENT PROCEDURE

The consent procedure has been especially helpful in alerting the Navy to problems involving major subcontracts before contractor action has been finalized. For example, on a multi-million dollar purchase of major shipboard propulsion machinery, the shipbuilder requested offers from the two major potential sources. Although both suppliers responded to the solicitation, it was evident to the Navy that an award could not be made on the basis of adequate price competition. The low offeror was the only firm which had supplied these particular items for Navy ships and had a decided advantage over the other offeror due to previous design effort, experience, and the possession of required manufacturing tooling. Thus true price competition was not present. The supplier involved had long refused to submit cost or pricing data and did so again in this case. Upon receiving notice of this refusal from the shipbuilder, the Navy provided assistance to obtain the necessary cost data. After prolonged and extremely difficult negotiations, the supplier finally agreed to submit such data directly to the Navy and to submit to a Government audit of its proposal. As a direct result, the Navy was able to obtain a reduction in the subcontractor's proposed price to the shipbuilder.

In another example, a shipbuilder requested the Navy to consent to placement of a subcontract for certain pumps at a price about 30 percent higher than the price paid for similar pumps a year earlier. The shipbuilder had not obtained and evaluated the supplier's cost data, however, as required by the Truth in Negotiation Act. For this reason the Navy refused to consent to the proposed

subcontract. After further efforts the shipbuilder did obtain cost data which permitted, through extensive negotiations over price and technical requirements, this subcontract to be placed at a substantially lower price.

The foregoing describes the Navy's overall program, examples of specific problems encountered, and actions taken to improve contractor procurement practices in the shipbuilding industry.

This Subcommittee has also had the benefit of VADM Rickover's testimony on this subject, in which he recommended increased emphasis on the use of the subcontract consent procedure. This same recommendation has been made to me independently by my staff and by the Chief of Naval Material. In the program described above I believe that the Navy has been quite responsive to this recommendation.

JUNE 30, 1969, SAR FIGURES

Chairman PROXMIRE. Mr. Sanders, you are the Assistant Secretary of the Navy for Installations and Logistics and the key Navy official in charge of Navy procurement. Monday of this week the General Accounting Office gave this subcommittee the figures provided by the Navy, to wit, on the current estimates of the final cost of about 26 key Navy weapons systems programs, Poseidon, Subroc, CVAN, and so forth. These figures were 6 months at least out of date. What are the latest estimates for these programs?

You see because of the inadequate data presented by the GAO based on Navy provided figures I had my staff call your office before 9 a.m. this morning asking you to bring the latest estimates with you and I talked to you just before we went into session and you said you hoped they would come up while you were testifying. I want to run down that list of selected acquisition reporting list and ask you to give us the latest estimate and to comment on the adequacy of the June 30 SAR figure.

First there is the P–3C. Its planning estimate was $1,294 million.

Mr. SANDERS. Mr. Chairman, Captain——

Chairman PROXMIRE. The current estimate was $2,261 million. What is the latest figure?

Mr. SANDERS. Mr. Chairman, Captain Freeman has that list.

Captain FREEMAN. These were, as I mentioned——

Chairman PROXMIRE. Fine.

Captain FREEMAN (continuing). Hastily gathered and while we will provide them to you we would like to correct any of these figures which turn out to be inaccurate for the record.

Chairman PROXMIRE. On the P–3C has it gone up or down?

Captain FREEMAN. As of September 30 the figure is $2,261 million.

Chairman PROXMIRE. So that has increased about $60 million and the AN/BQQ–2?

Captain FREEMAN. That was a one-time report on the June 30 SAR and the report is not being made on September 30.

Chairman PROXMIRE. You have no later figure?

Captain FREEMAN. I have no later figure.

Chairman PROXMIRE. All right, Sparrow E.

Captain FREEMAN. $262.7 million. I have it for the Sparrow F.

Chairman PROXMIRE. What's that?

Captain FREEMAN. $425.9 million.

Chairman PROXMIRE. It is the same as it was?

Captain FREEMAN. Yes, sir.

Chairman PROXMIRE. All right, the next is the Phoenix, that is $1,022 million.

Captain FREEMAN. It is now $1,498.9 million.

Chairman PROXMIRE. That has gone up almost 50 percent. It has gone up from $1,022 million to $1.49 billion, is that correct?

Captain FREEMAN. These figures, as I am sure you are aware, there have been some changes made in the SAR procedures on September 30 and there are footnotes associated with a lot of these final figures which we will provide.

Chairman PROXMIRE. Then there is the Mark–46 model 1.

Captain FREEMAN. This was again a one-time report, Mr. Chairman.

Chairman PROXMIRE. All right. The Mark 48–Mod 0.

Captain FREEMAN. Mark 48–Mod 0, $3,240.8 million.

Chairman PROXMIRE. That has gone down. What is the reason for that?

Captain FREEMAN. I haven't got the specific data available to answer that question.

Chairman PROXMIRE. There is the EA 6B.

Captain FREEMAN. $1,034.9 million.

Chairman PROXMIRE. The same as before. Walleye II?

Captain FREEMAN. $348.7 million.

Chairman PROXMIRE. That is way up. That is triple. It was $134.6 million and now $348 million.

Mr. FROSCH. Back to the contract definition.

Chairman PROXMIRE. What is that?

Mr. FROSCH. It is much closer to the contract definition number. I would suspect there was a problem in defining what the SAR numbers meant.

Chairman PROXMIRE. The F–14?

Captain FREEMAN. $6,373 million.

Chairman PROXMIRE. The same as before.

Captain FREEMAN. Yes, sir.

Chairman PROXMIRE. Standard Arm.

Captain FREEMAN. $228.5 million.

Chairman PROXMIRE. That is down. The S–3A.

Captain FREEMAN. $2,891.1 million.

Chairman PROXMIRE. That is the same as before. The AN/SQS–23.

Captain FREEMAN. $322 million.

Chairman PROXMIRE. That is about the same, a little up. The A–7E.

Captain FREEMAN. $1,917.6 million.

Chairman PROXMIRE. That is down a little. Then there is the Mark 48–Mod 1.

Captain FREEMAN. $132.7 million.

Chairman PROXMIRE. $132.7 milion.

Captain FREEMAN. Yes, sir.

Chairman PROXMIRE. That is up. There is the Condor.

Captain FREEMAN. $182.1 million.

Chairman PROXMIRE. That is up from $167 million.

Captain FREEMAN. Yes, sir.

Chairman PROXMIRE. There is the F–4J.

Captain FREEMAN. That was also a one time report on 30 June, Mr. Chairman.

Chairman PROXMIRE. All right. No later information. AN/SQS–26CX.

Captain FREEMAN. $119.6 million.

Chairman PROXMIRE. That is unchanged. There is the CH46 E/F helicopter.

Captain FREEMAN. That was also a one-time report.

Chairman PROXMIRE. All right, there is the LHA.

Captain FREEMAN. $1,425.2 million.

Chairman PROXMIRE. That is down somewhat. There is the DE–1052.

Captain FREEMAN. $1,396.4 million.

Chairman PROXMIRE. That is up some. There is the CVA–67 and 68.

Captain FREEMAN. This was omitted due to the fact we are undergoing negotiations at the present time, Mr. Chairman.

Chairman PROXMIRE. Poseidon, I guess you have given us the latest figures you have on this.

Captain FREEMAN. Yes, sir.

Admiral SMITH. Yes, sir.

Chairman PROXMIRE. During your testimony. Subroc.

Captain FREEMAN. That was a one-time report, sir.

Chairman PROXMIRE. SSN 637.

Captain FREEMAN. $2,837.6 million.

Chairman PROXMIRE. All right.

Thank you very much for bringing us up to date on that.

Mr. Sanders, you are aware, I am sure that Congress cut $5.6 billion from President Nixon's and Defense Department's fiscal year 1970 revised budget request. Is that not correct?

Mr. SANDERS. Yes, sir.

Chairman PROXMIRE. Of course, you are in an unusual position to appraise this because as you have said before you have worked on both sides of the table. Is it not correct that this appropriation cut resulted in a $3 billion cut in fiscal year 1970 DOD outlays?

Mr. SANDERS. I have no knowledge on that. I would like to check that for the record, sir.

Chairman PROXMIRE. Well, the Joint Committee on Reduction of Federal Expenditures gives that figure.

Mr. SANDERS. I have no reason to question it but I would like to check it and make sure.

Chairman PROXMIRE. I read in the press last Friday and today that the President and the administration are saying that these congressional cuts do not count; that they, not Congress, should get credit for the military cut. I am sure you have seen those stories. But, is it not true that the DOD submitted no official revised estimates to Congress after the President's revised budget request on April 15?

Mr. SANDERS. I would have to check that for the record. I don't believe they did.

Chairman PROXMIRE. Well, they didn't. Is it not also true that the Secretary, Secretary of Defense, said he was ordering cuts only reluctantly, he said that on August 21, 1969, and only after Mr. Mahon

earlier told him that it was his intention and that of Congress to cut the military budget by $5 billion and more.

Mr. SANDERS. I believe you are direct quoting it.

Chairman PROXMIRE. I remember reading the Secretary complains congressional imposed cuts would harm our defense effort. Later, on December 9 he appeared before the Senate to ask that we put back about $400 million of the House cuts and referred to these as, I quote, "severe congressional cuts."

Let me ask you this, how is it after failing to send up any revision after objecting to the congressional intention to cut, after criticizing us for the cuts, the administration is now loosing a barrage of background press comments and direct Presidential statements trying to take credit for the cuts and blaming Congress for a $3 billion cut.

Mr. SANDERS. Sir, that is something I think you should discuss with the Secretary of Defense, certainly not with me.

Chairman PROXMIRE. Can you explain all the stories now appearing that the administration should get credit for the cuts and the Congress all the blame for the increases?

Mr. SANDERS. I repeat my statement.

Chairman PROXMIRE. I would like to read an article from one of the finest reporters in the Nation, Edwin Dale, and from one of the great newspapers, the New York Times. He said this—

> In many congressional minds, the addition of $3 billion to spending in the current fiscal years through a variety of actions and inactions is offset by a cut of the same amount in defense outlays.
>
> But the $3 billion defense cut had already been imposed by the President before Congress acted and was incorporated in his overall spending ceiling of $192.9 billion, which now seems certain to be substantially exceeded.

Now, Mr. Dale who is, as I say, a very fine reporter and very capable in every respect and understands these things well, how he could come to that conclusion is absolutely beyond me. I thought maybe you could enlighten me because you have been on both sides of the table and you understand these things far better than most of us do.

Mr. SANDERS. I am afraid I can't help in this area, Mr. Chairman.

Chairman PROXMIRE. I might say Mr. Dale was quoting the administration in making this report. Maybe that explains what he wrote.

I want to thank you very much, Mr. Secretary. These appearances are never completely pleasant but I think you have done a fine job and I think the men with you deserve a great deal of credit for being responsive and helpful and very cooperative, and we are most grateful to you for having appeared.

Mr. SANDERS. We are most pleased, sir, to be here and thank you for the courtesy and cooperation you and the members of your staff have shown us.

Thank you.

Chairman PROXMIRE. Thank you.

The subcommittee will stand adjourned.

(Whereupon, at 12:30 p.m., the hearing was adjourned.)

APPENDIX

(The following additional questions asked by Representative Moorhead and answers thereto were subsequently supplied for the record by Admiral Sonenshein:)

Question 1. What is the current cost estimate for the CVAN 68? If there has been an increase from $536 million (exclusive of outfitting material costs), please supply a detailed breakdown of the increase.

Answer. In August 1967, the Navy estimated the cost of CVAN 68 to be $544.2 million. In December 1968, a program budget decision directed deletion of funds for outfitting and post delivery as entries not directly associated with the construction of ships. This deletion reduced the estimate of the ship to $536 million.

The major portion of the cost of CVAN 68 is the shipbuilder's price for construction. The Navy is currently negotiating a fixed-price incentive-fee type contract with the shipbuilder, which will establish target and ceiling prices for the *Nimitz* based on fiscal year 1967 shipbuilding labor rates and material prices in effect when the ship was started.

A factor over which the Navy has no control is the change in market price for labor and materials as the economic environment of the United States changes from the prices existing when the *Nimitz* class was started in fiscal year 1967. If this change in market price (inflation) is different from what the Navy has been permitted to budget, the estimated end cost will change accordingly. Further, since fixed-price incentive-fee type contracts contain an incentive-sharing arrangement where the Government pays part of the costs if they should exceed the target cost, the Navy's liability under this contract may exceed the target price and will depend on the shipbuilder's efficiency and the problems which may arise during construction of this new design ship. The contract will include a ceiling price to limit this potential liability.

The information currently available to the Navy supports the $536 million estimate for the *Nimitz* except for the reserve for escalation. The 1969 shipbuilder's labor contract settlement indicates that the budgeted escalation reserve is probably not adequate. The additional escalation for both labor and material which will occur before delivery is not known. Also it is not known whether possible increases in the shipbuilder's efficiency during construction of the ship will offset any or all of the higher than budgeted escalation. The Navy does not plan to change the budget amount for the *Nimitz* until firm information is available. By the middle of 1971 construction of the ship will be sufficiently advanced so that the Navy expects to be in a position to make a firm prediction of its final end cost.

Question 2. If there has been an increase, how long has the increase been known to the DOD?

Answer. The Navy's August 1967 budget estimate of the total end cost of the *Nimitz* has not been increased. The controlling elements are the shipbuilder's price and the effect of inflation, as discussed in the answer to question 1. The present uncertainties in the budget estimate for the *Nimitz* are the same as those discussed in the answers to Congressman Moorhead's questions 4 and 5 referred to in the letter to you from the Assistant Secretary of Defense (Installations and Logistics) dated 30 July 1969.

Question 3. Are there any indications that the cost of the CVAN 68 might increase further?

Answer. Yes. As discussed in the answer to question 1, if improvements in shipbuilder efficiency do not compensate for the higher than budgeted escalation of labor and material costs which has been occurring, the end cost will increase.

Question 4. Please provide in writing a detailed analysis of (a) the reasons for the additional costs of a nuclear powered carrier, (b) justifications for spending that extra money in terms of increased effectiveness.

Answer. The initial construction cost of a nuclear powered aircraft carrier is about ⅓ more than the initial construction cost of a conventional carrier with the same military characteristics other than propulsion endurance, when fuel costs are excluded from both ships. The initial nuclear fuel, which will provide at least 13 years of normal operations in the *Nimitz* class carriers, is an additional investment cost in nuclear carriers; whereas, in a conventional carrier the fuel and fuel delivery costs are considered operating costs. The lifetime cost of ship propulsion fuel including the cost of delivering it to the ship is expected to be greater for a conventional carrier than for a nuclear carrier. The total lifetime cost of building and operating a *Nimitz* class nuclear carrier, excluding aircraft costs, is about 10% higher than that of a conventional carrier with the same military features. When air group and support costs are also considered a *Nimitz* class carrier is about 2% more expensive than a conventional carrier.

The cost differential between a nuclear and conventional carrier is due to the higher cost of fabricating and assembling nuclear equipment which must operate safely in a radioactive environment.

The Navy's recommendation for nuclear power in surface warships is based on the improvements in readiness, response, mobility, tactical flexibility, and survivability which derive from being independent of propulsion fuel logistic support. These improvements are important in all circumstances and could be decisive in many situations.

The Chief of Naval Operations has stressed that an essential consideration in the conduct of war is the supply of propulsion fuel for military vehicles of all types—land, sea and air. The history of modern war is replete with examples in which the lack of propulsion fuel was a controlling factor and with examples of offensive operations which were restricted in scope and success by the inability of the logistic support forces to provide adequate propulsion fuel.

The vulnerability of our overseas logistic supply lines required to sustain Army, Air Force, and Navy forces in combat is greater today than at any time in the past and is continuing to increase for the following reasons:

The increased threat of submarine attack because of the advent of nuclear powered submarines and improvements in conventional submarines.

The increased threat of air attack because of the increased range of aircraft and missiles and their improved ability to detect targets.

The amount of fuel which must be transported has increased because of the higher consumption rate of post-World War II military units.

Each tanker lost now has a manifold greater impact because of the substitution of a smaller fleet of larger tankers for the large fleet of smaller tankers used in World War II. Most tankers then were of 10,000 to 15,000 tons full load, the largest being about 25,000 tons. Presently, many tankers are over 100,000 tons and plans are being made to build tankers of 500,000 tons and larger.

As the number of nuclear submarines and air striking capabilities of our potential enemies increase, the difficulty of providing logistic support when supply lines to our combat forces are under attack will increase. A principal reason for developing nuclear power for surface warships is to reduce the logistic support required for our fighting forces.

The principal advantages afforded by nuclear propulsion to surface warships derive from their ability to steam at high speed for virtually unlimited distances without refueling. In the carrier, there are important additional benefits. Because the nuclear carrier does not have to carry black oil for propulsion, there is more room within the ship's hull for aviation fuel and other combat consumables. This gives the nuclear carrier greatly increased combat staying power compared to its conventional counterpart.

These two qualities give the CVAN the ability to:

Respond immediately to a contingency beyond the range of emplaced U.S. forces without waiting for supporting units or the prepositioning of logistic support;

Conduct combat operations while approaching the objective area;

Continue combat operations without support or replenishment for the period of time required to establish sea-based logistic support lines. If the threat to logistic supply lines is too great in the combat area, nuclear propulsion provides the capability to transit at high speed to and from distant and less vulnerable sources of ammunition, aviation fuel, and other supplies needed to continue in action.

This increased effectiveness provides the nuclear powered carrier with a capability unmatched by any other tactical air system.

Question 4 continued. Does the increased effectiveness permit us to have a smaller force of nuclear carriers? If so, how many fewer?

Answer. The increased effectiveness of nuclear powered attack carriers is needed to upgrade the overall capability of the U.S. Navy's carrier force in order to keep pace with the Soviet's advancing technology and growing Navy. If less effective carriers were provided, more ships would be needed in order to attain the required overall effectiveness of the carrier force.

The new *Nimitz* class carriers are needed to meet the growing Soviet threat. The World War II *Essex* class ships in our carrier force cannot operate the most advanced models of fighter (F–4), attack (A–6), reconnaissance (RA–5C) or surveillance (E–2) aircraft. Modern aircraft are necessary to cope with the new Soviet planes and weapons in their armed forces and in those of their satellites. The *Essex* class will not be able to operate an air wing in the seventies which can survive in the environment of Soviet weapons technology.

The primary mission of the U.S. Navy is to assure the continued free use of the seas in support of our national objectives. The attack carrier force is the principal element of the surface fleet through which our control of the sea is exercised. To effectively carry out this role the carrier force must be able to prevail over potential foes. This requires that attack carriers be able to conduct operations at sea against determined opposition, with aircraft capable of achieving air superiority against first line enemy equipment. Further discussion concerning the required force level of attack carriers is included in the answer to question 15.

Question 5. What is the current cost estimate for the first DLGN? If it has risen above $222 million, please indicate how long this increase has been known and supply a detailed breakdown of the cost increase.

Answer. The current cost estimate for the DLGN 38 is $222 million.

Question 6. What has been the average annual increase in pay rates in the shipbuilding industry since 1962?

Answer. Average direct pay rates in the shipbuilding industry as reported by the Bureau of Labor Statistics have increased at an average of 3¼% compounded annually since 1962. However, each yearly change has varied widely—from 1966 to 1967 wages increased an average of 4.3%; from 1967 to 1968 wages increased an average of only 2.9%; but then 1968 to 1969 wages increased an average of 6.5%. Current contract negotiations in allied fields (other industries closely associated with shipbuilding) indicate large wage increases may occur in future labor contract settlements.

On top of such direct wage increases there also appears to be a trend toward (1) lower productivity which would require more manhours to build each ship, (2) increased labor fringe benefits which are in addition to the increases in direct labor rates, (3) higher costs for materials and components, and (4) higher profits on each contract.

Question 7. How much of the Truxtun's cost was overhead and how much of the estimated material cost of DLGN is overhead?

Answer. See below.

Question 8. Please provide in writing a detailed analysis of the reasons for the increase in cost between a conventional powered ship and the current nuclear powered ship and between the Bainbridge and Truxtun and the current estimates. What is the justification in terms of increased effectiveness?

Answer. The cost to build a conventionally powered guided missile frigate would be about $60 million less than a comparably configured nuclear-powered guided missile frigate. About $14 million of the $60 million higher cost of the nuclear powered frigate is to provide the inital nuclear fuel which will operate the ship for about ten years. Fuel and fuel delivery costs are not included in the acquisition costs of conventional ships. The remainder of the cost differential between a nuclear and a conventional frigate is due to the higher cost of fabricating and assembling nuclear equipment which must operate safely in a radioactive environment.

The Navy considers that the advantages of nuclear propulsion in frigates are well worth the additional cost. Nuclear power provides the following specific advantages which increase the offensive and defensive military capabilities of surface warships.

a. Virtually unlimited endurance at high speeds which gives—
(1) increased tactical flexibility and freedom of independent action;
(2) Capability to cycle in high-speed transit to and from distant and less vulnerable sources of ammunition, aviation fuel, and other supplies needed to continue in action; and
(3) freedom to extend attack along a greater perimeter.

b. Reduced vulnerability due to—
(1) freedom from dependence upon replenishment in areas of high threat;
(2) ability to transit at high sustained speeds;
(3) enhanced opportunity to use evasive transit tracks.

c. Significantly reduced dependence upon logistic support gives—
(1) decreased requirements for mobile logistic support forces; and
(2) reduced requirements for escort ship fuel at bases and prepositioned at depots.

d. Greater attack effectiveness due to—
(1) ability to be on attack station a higher percentage of time;
(2) increased ability to exploit weather conditions; and
(3) ability to arrive on station and conduct immediate operations without replenishment.

When overall costs of a carrier task group are considered, including the cost of the carrier, aircraft, escorts, and logistic support to the task group, the extra lifetime cost to provide nuclear power in a frigate or destroyer is only about 1 percent of the overall cost of the task group. Thus, providing nuclear power in four escorts for a nuclear carrier would increase the lifetime cost of a nuclear carrier task group by only 4 percent.

The war experience in Vietnam has shown that two-thirds of the fuel used by a conventional carrier task group—a carrier plus its escorts—is used just to keep the ships running. One-third is used for escort propulsion, and the other one-third is used for aircraft fuel. So if the need for fuel for the escorts and the carrier itself is eliminated by utilizing nuclear propulsion, only one-third the amount of fuel is needed. This simplifies the logistic problem tremendously.

Each time a nuclear-powered warship is substituted for a conventionally powered warship in a carrier task force, the overall capabilities of the whole task force are improved. When a nuclear carrier is substituted for a conventional carrier, the range of a carrier task group with four conventional escorts is about doubled. When two of the escorts accompanying the nuclear carrier are nuclear, the range of the carrier task group is almost doubled again. When all of the escorts with the nuclear carrier are nuclear, the range of the carrier task group is essentially unlimited.

Since nuclear propulsion in the escort ships improves the military effectiveness of the task group as a whole, the increased cost of the task group as a whole is the cost which should be considered in determining the cost effectiveness. Each escort for a nuclear carrier that is changed to nuclear propulsion adds about 1 percent to the overall lifetime cost of the nuclear carrier task group. The overall increase in task group effectiveness would be much greater than this.

At the keel laying ceremony for the USS *California* (DLGN 36) on January 23, 1970, Secretary of Defense Laird summarized the advantages of nuclear power in frigates as follows:

"As an escort to the nuclear aircraft carriers of the present and future, *California* and her successors will greatly extend the range of attack carrier striking forces.

"The additional radius of action which *California* and her successors will provide to naval forces will be of great value to the defense of our country and our allies. This is particularly important as we face the inescapable reality of a growing Soviet Navy expanding its seapower around the world. The Soviet Navy is now second in power only to our own.

"As we make major reductions in the Defense budget, we must guard against impairing our research and development programs and endangering a ship modernization program that is vitally needed as we face the challenge of the 1970's."

The table below shows the current estimated cost of each DLGN-type ship or the total cost actually incurred for those ships which have been constructed.

	Fiscal year of congressional authorization	Actual cost or current estimate (millions)
DLGN 25	1959	$155.5
DLGN 35	1962	130.8
DLGN 36	1967	200.0
DLGN 37	1968	180.0
DLGN 38 (formerly DXGN)	1970	[1] 222.0

[1] Does not include outfitting/post delivery costs.

Note: A discussion of the differences among the various classes of nuclear frigates is contained in the answer to Congressman Moorehead's question 10 referred to in the letter to you from the Assistant Secretary of Defense (Installations and Logistics) dated July 30, 1969.

Question 9. What were the total material costs of the *Truxtun and the estimated material cost of the current DLGN?*

Answer. See below.

Question 10. Please supply the following labor information:

TRUXTUN (ACTUAL)		DLGN (ESTIMATE)	
Hull	labor hours	Hull	labor hours
Propulsion	labor hours	Propulsion	labor hours
Electronic Warfare Systems	labor hours	Electronic Warfare Systems	labor hours
Missile Systems	labor hours	Missile Systems	labor hours
Other (identify)	labor hours	Other (identify)	labor hours

Answer. Answer to questions 7, 9, and 10.

Contract negotiations on DLGN 38 are scheduled to begin 11 February 1970. Because of the sensitivity of cost estimates on overhead, material, and labor in contract negotiations this information cannot be provided at this time without prejudicing the contract price. The part of a ship's cost that is overhead for two ships built in separate yards cannot be meaningfully compared. For instance, Newport News classifies all of its first level of supervision as productive; whereas, Electric Boat, Groton, classifies the same first level of supervision as overhead. Thus, the definition of what is overhead varies from yard to yard and cannot in itself provide any purposeful means of comparison. It should be noted that the above variance in definition of overhead also has an impact on labor hours and material cost. For instance, Electric Boat apparently uses less man-hours but has more overhead than does Newport News. Material costs are likewise not comparable on a yard-to-yard basis. Newport News makes more equipment in their own yard than any other shipbuilder. Therefore, their labor hours will be high and material cost will be low. Since the *Truxtun* was built at a different yard than the yard that will build DLGN 38, the estimates requested in questions 7, 9, and 10 would not in themselves provide a meaningful comparison. A meaningful comparison could be made between these estimates for two ships built in the same yard.

Question 11. How much of the JFK's total cost was overhead? What is the estimated overhead cost of the Nimitz?

Answer. See answer to question 13.

Question 12. What was the material cost of the JFK? What is the estimated material cost of the Nimitz?

Answer. See answer to question 13.

Question 13. Exclusive of the propulsion system, how many labor hours were expended in building the "JFK"? On the same basis, what is the estimated labor content of the Nimitz?

Answer. *JFK* was constructed on a fixed-price contract based upon competitive bidding procedures. Additionally a contractor claim on *JFK* has not yet been adjudicated. Accurate actual cost figures, broken down in the manner requested, are not available.

Estimates of labor, overhead and material costs on *Nimitz* are sensitive information with respect to the negotiations now in progress and cannot be provided at this time.

A cost comparison between *JFK* and *Nimitz* must reflect the improved operational effectiveness of *Nimitz* and the impact of inflation due to the later building period of *Nimitz*. A discussion of the relative cost of nuclear and conventional carriers is included in the answer to question 4.

Question 14. Regardless of what fiscal year they might be submitted to Congress for approval, how many CVAN's does the Navy presently anticipate building?

Answer. The approved Department of Defense Five Year Program provides for the construction of three nuclear-powered attack carriers of the *Nimitz* class: CVAN 68 (*Nimitz*), CVAN 69 and CVAN 70. If the CVAN 70 is approved by Congress it is expected to be delivered to the Fleet in 1977. At that time the attack carrier fleet will consist of 8 modern *Forrestal* class carriers, and 4 nuclear-powered carriers. In addition, depending on the attack carrier force level approved at that time, the attack carrier force might include the then 32-year-old *Midway* which will complete a modernization in 1970, the then 32-year-old *Franklin D. Roosevelt* and the then 30-year-old *Coral Sea.*

The Navy's plans for additional CVAN construction beyond the CVAN 70 are not firm at this time. However, the Navy is currently conducting concept formulation and design studies for a new class of nuclear-powered attack carriers to be constructed as a follow-on to the *Nimitz* class. It is clear that, regardless of the attack carrier force level approved at any given time, the Navy's carrier force must have a steady input of new ships in order to match the continually improving capabilities of our potential enemies. This is necessary to upgrade its capability through infusion of modern technology and to replace ships no longer capable of meeting the demands on them—whether because of their inherent design limitations or because of their age. Were the Navy required to operate a smaller carrier force, the improved capabilities of the CVAN's would become even more important. The smaller the force, the more important it is that each carrier have the greatest achievable capability.

The maximum life of an attack carrier is 25 to 30 years. A 15-carrier force level requires construction of one new carrier every 2 years if they are to be replaced when they are 30 years old. If the force level were to be reduced to 12, it would be necessary to build a new carrier every 2.5 years.

The three *Nimitz* class carriers are the only carriers authorized or currently approved by the Department of Defense from fiscal year 1964 through 1975, a period of 12 years: this will average out to but one new carrier every 4 years.

Question 15. Why do we need a force of 15 attack carriers? Why wouldn't 12 carriers do? Please provide a detailed written analysis of what the difference between 12 and 15 carriers permits us to do. Are the extra 3 carriers needed for Europe or for Asia? In either case, why can't the job be done as effectively from land bases? Where are we likely to fight where we don't have adequate land bases?

Answer. *a.* Attack carrier force levels are determined by the requirements of the national military strategy, and in consideration of the capabilities of all the services. For all levels of military action other than all-out nuclear war—from a show of force to general war—the attack carrier is the primary striking force of our Navy. It provides the offensive power necessary to assure free use of the seas and the air over the seas in support of our national objectives. Despite the tremendous technological progress that has been made in transportation and weapons systems in this century, free use of the seas—which cover three-fourths of the earth's surface—continues to be essential to the security of the United States, whether we are forced to fight to defend ourselves or to help defend our allies.

Our current military strategy is a forward one, predicated on overseas alliances and deployed forces. Control of the seas and the air space over the seas is vital to the success of this strategy. Today our overseas allies depend upon our support, which must come by sea. There is no valid plan for overseas military operations of the Army Air Force or amphibious forces with embarked Marines that does not depend on our free use of the seas. For example, 98 percent of all of the supplies which have gone to Vietnam have been carried by ships.

The primary function of the U.S. Navy is to grain and maintain supremacy at sea and its air space. The carrier force is the principal component of the Navy through which this superiority is assured in the face of the growing Soviet naval threat. The attack carriers are the measure of difference between the two Navies, because the carrier provides air power at sea. Recent history has conclusively demonstrated that surface forces cannot survive in the face of strong air threat without air superiority. Current studies and war plans indicate that the number of carriers required by this strategy range from about 15 to more than 25 depending upon the situation as it develops and the degree of risk accepted. The force level of 15 attack carriers is based upon the requirements of this strategy.

b. The number of carriers which can be deployed out of a total force level of 15 depends upon the national military posture. Our present national strategy relies heavily upon military forces deployed overseas—forces capable of responding to a spectrum of contingencies in overseas areas of primary national interest. These forward deployed forces, which must be supplied by sea, provide this country with flexible and rapid response to whatever pressures our potential enemies may apply.

Under mobilization conditions corresponding to an all-out declared war, with personnel frozen in assignments and essentially no budgetary restrictions, up to 90% of the fleet can be maintained in a deployed status. In these circumstances when national survival is at stake, planned maintenance to conserve ships and equipment for long-range future contingencies and the rotation of personnel to provide a normal family life become secondary factors. The cumulative effect of the continuing wear on men and material is accepted as the price of national survival.

Without mobilization and with peacetime personnel policies and funding levels, about half of the fleet can be kept deployed in a surge effort when required. The effects of a surge effort are reflected in the gradual lowering of the material condition of the fleet and increasing personnel problems which result from high-tempo operations.

Under peacetime funding and personnel policies and the associated operating conditions, about one-third of the fleet can be maintained in a steady-state deployed status over an indefinite span of many years without a decline in fleet readiness due to reduced material condition or personnel availability. This posture permits regular overhauls to preserve the material condition of our ships and a reasonable personnel rotation which makes a surge capability possible.

The alternative to a steady state continuing deployment of one-third of the fleet during peacetime on a rotational basis would be the establishment of a major overseas base complex with extensive facilities for dependents. Such an alternative has the disadvantages of increased costs, outflow of gold problems, and a lack of flexibility.

Deployed ships are maintained in a high state of material and personnel readiness, as a quick-reaction, combat-capable force available in the objective area of potential crises. During periods between overseas deployments, the ships and squadrons are assigned to the First and Second Fleets based in continental United States ports, where they are available to reinforce overseas fleets or respond to contingencies in areas other than those covered by the deployed forces. For example, in the Cuban missile crisis of 1962, eight carriers with their associated aircraft and surface combatants were committed to that emergency.

During the periods between overseas rotations, the ships also undergo modernization, routine preventive maintenance and necessary repairs as well as conduct individual unit training and participate in fleet maneuvers designed to test new weapons and develop new techniques and doctrines for their employment. While based in their home ports, the crews are afforded the opportunity for some time with their families and for leave and recreation.

Even during peacetime operating conditions, the responsiveness of the Navy is extremely high on a fleetwide basis. While it is true that the deployed units represent the most combat ready forces virtually the entire fleet can be readied and deployed on short notice. On 23 January 1970 for example, eleven attack carriers were at sea or immediately ready to go to sea. Two more could be ready in seven days and one in thirty days in an emergency. One attack carrier is in extensive overhaul.

A change in national strategy resulting in the withdrawal of our deployed military forces, would increase the requirement to maintain a strong maritime

posture. The capability of the United States to fight for an extended period in defense of its territory and areas of interest is dependent on our ability to maintain the flow of materials and oil over the seas. The sheer bulk of the daily use of oil for military and industrial needs precludes stockpiling quantities for more than short-term needs.

c. A reduction in carrier force levels from 15 to 12 would, in the total analysis, reduce the Navy's ability to carry out its principal function by a similar ratio. The specific, near-term impact would be a reduction of the number of attack carriers which can be maintained deployed overseas, and the force available to provide reinforcements and respond to other contingencies. Today with a force of 16 CVA's (one anti-submarine warfare carrier is assigned a CVA role because 15 CVA's are inadequate to accomplish current commitments) we keep two CVA's in the SIXTH Fleet deployed in the Mediterranean, and four in the SEVENTH Fleet deployed to the Western Pacific. With 12 CVA's we would be forced to reduce overseas fleets by one or two CVA's depending upon the length of time CVA forces are required—steady-state peacetime deployments would require a reduction by two CVA's.

(1) In any involvement in the Near East, any U.S. tactical air would have to be provided from carriers. There would be no land bases available to us within tactical air range of the objective area. The recent loss of Wheelus AFB eliminated our last tactical air base in North Africa.

(2) A reduction in the SEVENTH Fleet from four to three or two CVA's could seriously impair our plans for Vietnamization of the war in SE Asia. As land-based forces, including tactical air, are withdrawn, the responsibility for providing tactical air support for our residual in-country forces will shift progressively to the carrier force at sea.

d. An effective tactical air capability is essential to sustain our general purpose and logistic support forces against a determined enemy using modern weapons. Sea-based and land-based tactical aircraft are required to provide support for our forces in the areas of the world where we must be prepared to fight. Land-based tactical aircraft can be employed when their land bases have been adequately prepared, provisioned and defended, and when they are located within range of the area of conflict. Sea-based tactical aircraft are required when land bases are not available or do not have the capacity to meet the required tactical aircraft needs. The attack carriers can quickly concentrate this sea-based tactical air power. There are few areas in which we are likely to fight where we have adequate land bases to meet our tactical air requirements without attack carriers.

(1) In the volatile Middle East, there are no land air bases upon which we can depend in the event of our involvement in an Arab-Israeli crisis. In the central Mediterranean we have just lost Wheelus AFB in Libya, the last vestige of a once-extensive North African base system. Even NATO bases are not dependable; the use of Athens was denied the U.S. even for staging USAF squadrons during the Lebanon landings.

(2) In Southeast Asia, the lack of adequate land bases has required the deployment of up to five CVA's to the Seventh Fleet and the current commitment of 2 CVA's continually to Vietnam. The Commander in Chief Pacific determined in 1968 that it was far more economical and efficient to utilize carriers in Southeast Asia than to replace them with land-based air and the associated logistics infrastructure.

(3) The defense of Taiwan would rely almost entirely on naval forces including carrier-based aircraft.

(4) Contingency plans during the Cuban missile crisis of 1962 required the commitment of 8 carriers, including 3 CVA's to provide the level of tactical air required for the operation.

As noted in the answer to question 14, even if the attack carrier force level were to be reduced to 12 all three *Nimitz* class carriers (CVAN 68, CVAN 69 and CVAN 70) will be needed to match the continually improving capabilities of our potential enemies.

Question 16. Regardless of what year they might be submitted for approval, how many nuclear-powered guided missile frigates does the Navy anticipate building?

Answer. The Navy's DLGN 38 class inventory objective is [deleted] ships. Quantity and phasing are constrained by current fiscal guidance and subject to change during the Department of Defense planning cycle.

Question 17. What is the annual operating cost of a Polaris submarine?

Answer. Total system annual operating cost, distributed over the entire force of SSBN's, would average about $12 million per submarine. This would include the operating costs of the project office in Washington, field offices, tenders and resupply ships, as well as the cost of operational tests, patrol analysis, training and contractor engineering services.

Question 18. What is the estimated unit cost of retrofitting Polaris submarines to accept the Poseidon missile?

Answer. The unit cost varies according to the pre-conversion configuration and undistributed expenses charged to lead ships. The average cost per SSBN is estimated to be $33.3 million. This includes the cost of the installed equipment and related spares and services; it does not include the cost of missiles and concurrent overhaul.

Question 19. How many escort ships constitute a nuclear carrier attack force? What kinds of ships are these? What are their acquisition costs? What are their average annual operating costs?

Answer. There is no standard carrier task force composition. An attack carrier task force includes carriers and surface combatants with anti-aircraft and anti-submarine capability; sometimes a task force includes submarines or fast replenishment ships. As the name itself implies, a task force is constituted to perform a task, and the number and kinds of ships involved are related to that task. Under some conditions a carrier might be accompanied by six surface combatants, under other circumstances, such as prevail today in the Gulf of Tonkin, by only one or two.

We do not buy ships on a task force basis. New ships are procured to keep our Navy modern and capable, in numbers based on the expected threat. Naval task forces are constituted from the overall inventory of ships in the fleet.

The number of surface combatants included in a carrier task force is directly related to the anticipated enemy opposition. The cruisers and destroyers attack and destroy the enemy's submarines, surface ships and aircraft. The carriers and other ships operate together in a task force for mutual support and increased effectiveness in the destruction of enemy forces, essentially an offensive action.

If a nuclear carrier task force were to be organized today, it would have to be made up of the four existing nuclear-powered surface ships which, together with their costs, are listed on the attached unclassified document.

COST OF PRESENT NUCLEAR-POWERED TASK FORCE

[Dollar amounts in millions]

	Enterprise CVAN–65	Long Beach CGN–9	Bainbridge DLGN–25	Truxtun DLGN–35	Air Wing (94 aircraft plus spares)
Acqusition cost	$451.2 M	$328.4	$155.5	$130.8	$740.8
Nominal lifetime	30 years	30.0	30.0	30.0	7.0
Annual amortized investment cost	$15 M/yr	10.9	5.2	4.4	105.8
Operating costs:					
Annual fuel cost	$6 M/yr	1.5	1.3	1.3	
Overhaul cost per year	$9 M/yr	5.0	3.5	3.5	
Support cost per year (pay, training, overhead)	$26.8 M/yr	12.2	4.9	4.9	
Total, annual operating cost	$41.8 M/yr	18.7	9.7	9.7	98.2

NOTES

It should be noted that the Enterprise, Long Beach, and Bainbridge were not only the 1st surface nuclear-powered warships in the world but also incorporated unique features in nonpropulsion areas. Therefore, substantial 1st-design costs were required in both the nuclear propulsion and nonpropulsion areas.

The nuclear carrier's air wing is tactically more than twice as effective as that of the aging World War II carriers while being subject to fewer losses. In addition, the nuclear carrier's propulsion plant provides unlimited mobility and responsiveness. Additionally, Navy aircraft being procured as the standard inventory to compete in the world arena include F–4, F-14, RA–5, A–6, E–2, and A–7E, none of which can be operated from the World War II ships effectively.

Above costs include total direct and indirect costs for (1) procurement of both ships and aircraft, (2) training, pay and allowances, (3) supply and equip ships and air wing, (4) maintain, repair, and overhaul ships and aircraft, (5) allowances for aircraft pipeline and attrition, and operational training aircraft.

Total nnual operating cost for Air Wing includes, fuel plus overhaul plus support.

Question 20. Statements have been made that nuclear attack carriers are relatively invulnerable to attack. What measures exist that provide this "invulnerability" to cruise missiles; to other less sophisticated missiles such as the Soviet-built Styx; or submarine launched missiles equivalent to our Subroc?

Answer. *a.* Vulnerability is not an absolute quality. The nuclear attack carrier is neither completely vulnerable nor invulnerable. However, it is less vulnerable across the entire spectrum of warfare on a comparative basis than overseas land air bases or other surface ships.

Within the range of warfare situations, the greatest probability of conflict lies below the general war threshold. There have been many wars or near wars since the end of World War II. Yet no carrier has suffered loss or damage from hostile action during this period, in spite of the fact that all but two of our currently designated attack carriers have been involved in actual combat operations since World War II.

In contrast, all of the tactical air bases in South Korea were overrun by enemy ground forces in the Korean War. Some, with their stocks of ammunition and aircraft fuel, were captured a second time by Chinese Communists. In South Vietnam over 350 helicopter and fixed-wing aircraft have been destroyed on airfields and over 3500 more damaged by enemy ground attacks.

b. The technology of the anti-ship missile is the newest and the most formidable weapon for use against surface ships. However, the nuclear carrier is the least vulnerable of all surface ships to cruise missile attacks. Modern nuclear attack aircraft carriers with their embarked aircraft are the most powerful and toughest warships ever built. They are essentially offensive weapon systems designed to conduct strike operations against an enemy in a combat environment. Although the inherent mobility of the nuclear carrier makes it a difficult target for an enemy to find and attack, carriers are nevertheless designed to absorb damage from enemy action with minimum disruption to their operational capability. Furthermore, the nuclear carrier's aircraft greatly outrange even the most advanced Soviet cruise missile. The launching platforms, the surveillance systems, and the cruise missile itself are all vulnerable to attack and destruction by carrier aircraft. Carriers have faced the threat of guided missiles before, and have survived by a clear margin. In World War II, the Japanese launched 2314 aircraft in Kamikaze attacks against the U.S. Fleet, with the carriers as the principal target. Despite the fact that the Kamikaze was a guided missile with the most sophisticated guidance system possible—the human brain—not a single attack carrier was sunk by them.

On the other hand, the most vulnerable surface units to anti-ship missiles are the unarmored tankers, ammunition ships and troop carriers required for the support of our overseas allies and our own deployed land based forces.

The carrier's primary function of providing protection of vital sea lanes has become even more vital with the advent of the anti-ship cruise missile. Today, it is the fleet's best defense against cruise missiles because of the ability of its aircraft to attack the launching platforms before they are within missile firing range of our forces and to shoot down the anti-ship missiles that are launched while they are in flight.

c. The anti-ship missile capable air and submarine forces of the USSR constitute the greatest threat to the carriers of the U.S. Navy. However, this threat only becomes a reality during general war with Russia. It is probable that the Chinese Communist air and submarine forces will present an increasing threat in the future as they develop improved delivery vehicles and nuclear weapons. However, in a general war all available weapons may be employed including, most probably, nuclear warheads. Under these conditions there will be heavy losses on both sides.

However, under the more probable conditions of conflict less than general war, the threat of the anti-ship missile is substantially diminished, despite the fact that Soviet satellites are being furnished with some modern Russian weapons. The Soviets have provided the STYX missiles to the Egyptians. But the missiles which sank the ELATH were not launched in an attack conducted upon the high seas, but were fired from PT boats hidden inside Port Said. It is possible that similar missiles could be furnished to the North Vietnamese. However, the carriers in the Gulf of Tonkin have operated beyond the range of land-based STYX missiles, and no potential North Vietnamese anti-ship missile launching platform such as a PT boat or jet aircraft has ever penetrated the U.S. Naval defense in the Gulf of Tonkin to within effective missile range of our carriers. Whenever North Vietnamese PT boats have sortied from their bases, they have been

taken under attack, destroyed, or driven back by the combined offensive actions of our carrier planes and surface ships. It is not enough for a nation to simply have the STYX missile in its arsenal. It must also have a naval or air force capable of gaining local tactical superiority in order to permit the missile launching vehicles to penetrate to within striking range of their sea-going targets. The Egyptians were able to sink the Israeli destroyer when it ventured into range of Egyptian PT boats hidden in inland waters. The Egyptians have, significantly enough, not duplicated this feat on the open seas.

Some nations such as Albania, Egypt, North Korea and China do have Soviet-supplied submarines in their navies, but except in the case of China, these are generally training vessels, without any realistic combat potential against a first-line naval force. The greatest underwater threat to navies today is the nuclear-powered submarine and the submarine-launched anti-ship guided missile. The Chinese Communists today have neither of these.

The Soviets now have by far the largest submarine force in the world—about 350 submarines, all built since World War II. It is because of this threat that the Navy maintains a substantial force including carriers, long-range aircraft, submarines, and surface combatants assigned to the anti-submarine mission. These forces work in conjunction with an extensive ocean surveillance system. The attack carrier forces, with their integrated anti-submarine defenses and their high speed, are the least vulnerable of our surface forces to submarine attack. A nuclear-powered carrier force, with its sustained high speed, endurance and freedom from the need to resupply propulsion fuel, can minimize the opportunities for enemy submarines to gain attack positions.

If our carriers do sustain hits from conventional bombs, torpedoes or missiles, damage will occur, but that does not mean that the ship will be put out of action or sunk. Modern carriers are extremely tough ships.

No attack carrier built during World War II or subsequently has been lost to enemy action. The *Essex* class fought through the aircraft attacks, Kamikazes, and submarine attacks of World War II.

Subsequent carrier designs have incorporated even more extensive protective features, such as armored flight decks, improved torpedo protection systems, and internal damage-limiting features which make them very difficult to sink with non-nuclear weapons.

The hardness of the modern aircraft carrier is illustrated by the accident in the *Enterprise* early last year when nine major caliber bombs detonated on her flight deck. Yet the ship could have resumed her scheduled air operations within hours, as soon as the debris was cleared from the after end of the flight deck.

This accident, as well as other aircraft carrier accidents which have occurred in recent years, have been studied in detail to develop corrective action to reduce the possibility of future occurrence and to determine design features which can be incorporated in our new carriers to make them less susceptible to damage.

The new carriers will give our attack carrier forces the best protective capability we can build into our ships. The new *Nimitz* class nuclear-powered carriers are the best-protected and least vulnerable carriers ever designed. The added protection is provided by the extensive use of armor plating against bombs and guided missiles and improved anti-torpedo hull design. The high speed endurance and freedom from the need to slow down to refuel provided by nuclear propulsion, significantly reduce the nuclear carrier's vulnerability to attack.

If we were to reduce our future sea-based tactical air capability by failing to provide the needed improvements in carrier design, the overall vulnerability of the Navy and the logistics life line for all services would be increased.

Question 21. What was the original estimated R&D cost of the Mark 48 Torpedo? What is the current R&D cost?

Answer. As to the Mark 48 Torpedo Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk 48 Mod 1 Torpedo):

The Contract Definition Plan estimate of RDT&E cost for a program duration of 12 years as reported in the 31 December 1969 Selected Acquisition Report was $97.0M.

The current estimated total program RDT&E cost is $257.0M.

Answer. As to the Mark 48 Mod 1:

The original estimate of RDT&E cost was based on the original planning document for the Torpedo Mk 48 Mod 1 (Reference: MASWSP/NAVORD joint letter ser R-001429 of 4 August 1967) and covers only the period through *FY 1971*—this estimate was $52.2M.

The current estimate is based on the latest approved plan (Reference: Technical Development Plan (TDP) U2315, Torpedo Mk 48 Mod 1 of 1 April 1969) and updated to current estimates which includes plans through *FY 1974*—this estimate is $88.6M.

Question 22. What was the original estimated production unit cost of the Mk 48 Torpedo? What is the current equivalent production unit cost? Please supply a detailed breakdown of any cost increases.

Answer to question 22:

BACKGROUND

The Selected Acquisition Reports (SAR) on the Mk 48 Torpedo Weapon System use the Technical Development Plan (TDP) W23–06 of 1 March 1964 as the "Planning Estimate" (original estimate). In May 1963 contracts had been awarded to the Westinghouse Electric Corporation and the Clevite Corporation to prepare program definition proposals for development of the Mk 48 Torpedo. During the Spring of 1964 the program definition process was completed and Westinghouse was selected to develop the Mk 48 Mod 0 Torpedo and the Mk 27 Mod 0 Torpedo Target. On 11 June 1964 the Navy forwarded the 1 March 1964 TDP to the Secretary of Defense for approval, attaching an addendum which undated the program cost estimates taking into account the program definition report. The addendum reflected increased R&D estimates, but used the same production cost projections as the original submission. The 1 March 1964 TDP as amended by the 11 June 1964 forwarding letter is used in the SAR's as the "Contract Definition Plan." The fixed-price incentive-development contract was signed by the Navy and Westinghouse on 30 June 1964.

At the time (Jan.–Feb. 1964) the 1 March 1964 TDP was prepared, there was no actual Mk 48 Torpedo price data on which to base estimates of future production costs. Indeed, the production version of the proposed torpedo has not yet been developed. The detailed designs did not then exist, and no direct price information was available. The Mk 48 Torpedo was to have been based on the EX–10 advance development torpedo which was part of the Research Torpedo II program. The general degree of sophistication and complexity was known from EX–10 experience. Firmer production price information was available in the Mk 46 Torpedo program, which preceded the Mk 48 program. It was evident in 1964 that the Mk 48 would be considerably larger, more complex, and more sophisticated than the Mk 46. Therefore, it was known that Mk 48 production costs would be more expensive than the Mk 46.

ORIGINAL ESTIMATES

The only available source of "Production Cost Estimates" is the 1 March 1964 TDP. An estimated production cost can be deduced from the TDP data in the same manner as is done in deriving planned costs at current quantity in the SAR; by assuming that initial spare and non-contractor costs associated with each buy represented the same percentages of total funds as are used in current estimates. A learning (or cost/quantity) curve constructed from the annual quantities and funds can be used to derive the average unit price of contractor effort for the current planned quantity of 52 torpedoes, including initial spares, as opposed to the significantly larger quantity shown in the TDP. It is questionable whether the cost/quantity curve can be used legitimately for a buy as small as 52, because in very small production lots fixed production costs become a disproportionate percentage of the total cost; however, it is the base that must be used in the SAR in order to be comparable with the current estimate. Accordingly, the estimated unit price of the initial buy of 52 torpedoes is $138,462. Inflating this price to 1970 dollars, using the consumer price index through 31 December 1969, yields a price $167,816. This price includes initial spares but does not include non-contractor (in-house) effort. Non-contractor effort within TDP funding is $600K which inflates to $727K in 1969 dollars.

When these estimates were made, the advent of formalized disciplines such as configuration management, production assurance, environmental testing/materials, and production engineering/program management, which has occurred since 1964, was not foreseen. These types of costs were expected to be borne by G&A rates in the original estimates, while they are now spelled out and priced as separate line items in production contracts.

In May and June 1964 during negotiations leading to the development contract award, a requirement for an incentive on the "Unit Cost of Production" was imposed, for the purpose of obtaining cost data under the fixed-price contract, and negotiated. This incentive established a target cost goal for the raw cost of material and direct production labor exclusive of IR & D, G & A, and Profit of

$75,000 for the average warshot torpedo in the last one-fourth of the 85 production prototype torpedoes. The goal was based on a contractor estimate of $79K. This incentive called for a $1.0M incentive payment if the unit target cost was achieved, a maximum incentive of $5.0M if the unit cost was reduced to $63,750 and $0.0 if the unit cost exceeds $82,500. It is important to recognize that the incentivized "Unit Cost of Production" excluded all production costs except direct cost of material and production line labor for building warshot torpedoes. There is no known record of it being done in 1964; but, if 1964 IR & D, G & A and Profit rates alone are now applied, the $79K contractor unit-cost-of-production estimate would equate to a unit price estimate of $120K at 1964 dollars. Note that when the effects of inflation since 1964 are included in this "price estimate" it grows to $146K in 1970 dollars. Furthermore, this unit price cannot be compared with current planned procurement unit price estimates which include the prorated price of quality assurance, configuration management, off-line environmental testing, production engineering, and contractor proofing support and labor. It is important to note that neither the $75,000 unit cost incentive number nor the $120,000 unit price discussed in this paragraph were used in any way in making up the 1 March 1964 TDP program cost estimates or the 11 June 1964 addendum thereto.

CURRENT ESTIMATE

The current estimate of prorated unit torpedo production costs for the initial buy of 52 torpedoes is as follows:

Warshot torpedo hardware production	$383,731
Contractor production support: Configuration management, product Assurance, environmental testing/Materials, production engineering/ program management, and contractor proofing support	[1] 532,693
Update workshop test and handling equipment	13,462
Subtotal	929,885
Initial spares	157,692
Total	1,087,577

Other non-prorated costs include:

Depot support	6,283,000
Exercise hardware	6,803,000
Noncontractor (in-house)	8,104,000
Miscellaneous	400,000

[1] It should be noted that most of the contractor production support category is composed of formalized disciplines which have evolved since the original estimates were made. These costs will represent a much smaller percentage of total cost in larger quantity procurements and will decrease in cost over the term of the total production.

REASONS FOR INCREASES

A detailed breakdown of increases in estimated cost is not possible without a detailed breakdown supporting initial cost estimates. Such data is not available Several general factors are involved in the increase of unit cost. First, there have been detailed changes in the torpedo specifications, but these have been minor and have had only a small impact on hardware cost. Second, there have been some increases in approved rates of IR & D, G & A and Fee, and these have had a small effect on the estimates. Third, at the time the development contract was awarded in 1964, the economy had been relatively stable for some time. Cost estimates at that time reflected no anticipated economic inflation. Inflation has occurred. Development difficulties in the Mk 48 program have caused stretchout, increasing the impact on cost estimates. Fourth, is the fact that the torpedo is considerably more sophisticated and complex than was originally envisioned as being necessary to satisfy the performance specifications. This has been a major factor in the progression of increasing estimates of production costs. Lastly, the expanding requirements in the area of production support have led to a major cost increase in production. These support costs are particularly prominent in the first-year buy where they amount to over half of the total production cost.

Question 23. Have the weapon system characteristics and specifications been altered since the beginning of the Mark 48 program?

Answer. As to the Mark 48 Torpedo Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk Mod 1 Torpedo):

In the general sense the weapon system characteristics have not been changed. The specific performance characteristics called for in the specification involved on

the Mk 48 Mod 0 torpedo contractor have had several detailed technical changes, but none of these have affected the torpedo's basic performance. There have been no changes to such fundamental characteristics as endurance, acoustic detection range, depth, minimum warhead size, etc.

The specifications for the Mk 27 Mod 0 torpedo target have been modified in that a requirement has been added. Originally, the Mk 27 torpedo target was intended for use in pre-arranged development and evaluation test situations and not for fleet training. When a fleet training role was established the feature became necessary in order to permit realistic training exercises.

Answer. As to the Mark 48 Mod 1:

Only minor changes in weapon system characteristics and specifications have been made since the original plan in August 1967.

Question 24. Does the Mark 48 contract include any performance guarantees by the contractors?

Answer. As to the Mark 48 Torpedo Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk 48 Mod 1 Torpedo):

The only guaranty in the torpedo/torpedo target development contract is summarized as follows:

The contractor guarantees that, at the time of delivery of, the supplies provided for under the contract will be free from any defects in material or workmanship and will conform to the requirements of the contract.

Answer. As to the Mark 48 Mod 1:

The present engineering development contract is a level-of-effort type contract which requires a design disclosure package for the Torpedo Mk 48 Mod 1—performance guarantees are not required in the contract.

Question 25. What form of contracting has been used on the Mark 48 program?

Answer. As to the Mark 48 Tornado Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk 48 Mod 1 Torpedo):

The torpedo/torpedo target development contract is a fixed price incentive fee.

The fire control development contract is a firm fixed price.

Fire control production contracts have been fixed price incentive and firm fixed price.

The warhead/exploder development contract is cost plus fixed fee.

Answer. As to the Mark 48 Mod 1:

The engineering development contract is a CPFF-type contract. The proposed contract for the procurement of production prototype torpedoes (PPT) is a CPAF-type contract (expect to execute February/March 1970).

Question 26. How well does the Mark perform its mission today?

Answer. As to the Mark 48 Torpedo Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk 48 Mod 1 Torpedo):

The Mk 48 Mod 0 Torpedo today performs its mission in a very satisfactory manner.

Answer. As to the Mark 48 Mod 1:

The Torpedo Mk 48 Mod 1 is expected to meet all of the required specifications. In over 350 inwater runs satisfactory performance has been demonstrated and no known technical problems exist. Present plans include further testing of the development prototype torpedoes (DPT) to obtain sufficient data to proceed to production and delivery of the first production prototype torpedoes (PPT) in April to start the concurrent technical and operational evaluation of the torpedo.

Question 27. What form of technical performance tracking has been employed on the Mark 48 program? How useful has it been to the Navy?

Answer. As to the Mark 48 Torpedo Weapon System (including Mk 48 Mod 0 and Mk 48 Mod 2 Torpedoes but excluding Mk 48 Mod 1 Torpedo):

The contract for the development of the torpedo and torpedo target calls for reports in accordance with an "Integrated Management Information System (IMIS)" specification. IMIS provides for the planning and control of Schedule, Cost, and Technical Performance on an integrated basis. In its initial implementation, this system comprised extensive technical achievement milestones and specific plans for their achievement. As the contractor encountered technical problems and delays, he began to drop missed milestones and plans from the reporting system on the basis that a different technical approach was being pursued. The basic intent of the technical reporting system was to alert man-

agement that technical performance objectives were not being achieved within the scheduled time period.

The numerous and extensive technical problems coupled with the contractor's initial inability to develop specific plans for their resolution made it clear that the program was grossly off schedule. The level of detail replanning required by the IMIS was extensive and therefore required extensive resources to accomplish. Recognizing this condition early in 1966, informal person-to-person communication between Project Office, Technical Director and Contractor personnel was substituted for the specific and formal requirements for technical performance, planning and reporting as set forth by IMIS.

General technical performance information continues to be reported through IMIS, but the day-to-day identification and resolution of specific technical problems is accomplished outside the IMIS. At this point in time, IMIS technical reports reflect history only and do not reflect plans for future achievements.

The cost and schedule planning and reporting elements of IMIS continue to be used for overall surveillance of the total development contract. These elements of IMIS provided the basis for the preparation of the Contractor Performance Evaluation Report as well as other reports to higher authority.

Answer. As to the Mark 48 Mod 1:

The Naval Ordnance Laboratory, White Oak, Maryland (NOL/WO), is assigned the Technical Direction Activity. This assignment includes the technical direction and control of the torpedo during the development phase. Additionally, the NOL will conduct the technical evaluation of the torpedo.

Question 28. Would you provide the R&D costs and separately the per unit production costs of the following:

a. A–3 Polaris RV excluding and including the warhead?

Answer. Navy costs of A–3 re-entry body development were $115 million, including development of the arming and fuzing device, structural elements and compatibility with the missile. Warhead development costs were funded by the Atomic Energy Commission and are not known to Navy. These costs have been requested of AEC and will be furnished upon receipt.

The cost of Navy funded components of the A–3 re-entry body average $10.100 per unit, including the arming and fuzing device and structural components. AEC costs have been requested and will be furnished upon receipt.

b. Mark 3 Poseidon RV excluding and including the warhead?

Answer. Navy costs of MK–3 re-entry body development are estimated at $185 million. Unlike the A–3 re-entry body, the MK–3 arming and fuzing system is developed for the Navy by the AEC. The Navy funded this development and the costs are included in the $185 million. Navy also develops the shell and the interface between the re-entry body and the missile. AEC costs have been requested and will be furnished upon receipt.

The cost of Navy-funded components of the MK–3 re-entry body are estimated to average $101,500 per unit including the shell and arming, fuzing and firing system components furnished to AEC. AEC costs have been requested and will be furnished upon receipt.

c. Polaris missile (including RV's and warheads)?

Answer. The initial Polaris A–3 missile development cost was $695 million, excluding later improvements and the development funded by AEC. The AEC development costs have been requested and will be furnished upon receipt. The Polaris A–3 unit production cost averaged $1.46 million, excluding AEC costs which will be furnished later.

d. Nuclear attack submarines?

Answer. The production unit cost of the *Sturgeon* (SSN 637) class submarine is $77,778.000. The *Sturgeon* class is the largest class of SSN's authorized to date and is therefore most representative of unit cost. No R&D costs are associated with this class of submarine.

e. Polaris submarine (including missiles, RV's and warheads)?

Answer. Except for the weapon system, the Polaris submarine had been developed essentially when the FBM Program began. Development of the Polaris submarine weapon system cost $236 million, including all improvements incor-

porated to provide a Polaris A–1, A–2 and A–3 missile firing capability. The new construction cost for the 41 Polaris SSBN's averaged $101 million. Sixteen Polaris A–3 missiles at the average cost of $1.46 million would bring the total cost per submarine to $124.5 million, exclusive of re-entry body cost funded by AEC.

(The following information, provided by Barry J. Shillito, Assistant Secretary of Defense (Installations and Logistics), was subsequently supplied for the record:)

POSEIDON (C–3) PROGRAM STATUS REPORT AS OF MARCH 31, 1969

Service/command: Navy Department, Strategic Systems Project Office.

Mission and description: To develop and deploy a flexible sea-based Fleet Ballistic Missile weapon system to provide a highly invulnerable offensive weapon as a primary deterrent to enemy initiation of surprise nuclear attack, capable of inevitable retaliation against specified targets. Poseidon is a two stage solid propellant missile with improved accuracy, larger payload than Polaris and with multiple independent re-entry vehicles.

Prime contractors: Lockheed Missles & Space Corp., Gen. Elec. Ordn. Syst. Div., Western Electric, Sperry, MIT Instrumentation Lab., Raytheon, North Amer. Rockwell, Interstate Electronics, Gen. Dynam. Elec. Boat, Tenneco.

Prime contractor(s): LMSC, GEOS, WEC, Sperry, MIT/IL, Raytheon, NAR, IEC, GDEB and Tenneco.

[Dollars in millions]

Quantity	Original plan (October 1966)	Current approved program (Mar. 31, 1969)
R.D.T. & E.	Missiles	Missiles.
Production	26 SSBN conversions	30 SSBN conversion.

Program costs	Original plan (October 1966)	Original plan at current quantity [1]	Current approved program (Mar. 31, 1969)	Current estimate at completion [2]
R.D.T. & E.	$1,381		$1,818	$1,818
Production	3,771		5,173	5,173

[1] Not applicable. Changes in program are not measurable in unit quantities.
[2] Defined as completion of current approved program, i.e., through fiscal year 1974.

Program cost variance analysis:

RDT&E. (See Attachment No. 1.)

Procurement. (See Attachment No. 2.)

Estimated annual operating cost: The annual operating cost for 31 SSBN's equipped with the Poseidon weapon system is expected to be approximately the same as for the same existing SSBN's equipped with the Polaris weapon system. Increased complexity in some sub-systems will be off-set by greater simplicity and improved maintainability in other sub-systems.

The current operating cost for 31 Polaris SSBN's is estimated at $375.5 million in FY 1969 dollars. This includes one SSBN not yet on approved program.

PROGRAM COST VARIANCE ANALYSIS: RDT&E

Original plan versus current approved program

($ in millions)

Net capability increase	$90.7
Additional approved program years (fiscal year 1973/1974)	150.0
Polaris reclassification (fiscal year 1971 and fiscal year 1972)	59.0
Approved cost increases	97.2
Slip-in initial operational capability	3.5
Fire control and navigation improvement	36.6
Net total variance	437.0

PROGRAM COST VARIANCE ANALYSIS: PROCUREMENT

Original plan versus current approved program

Although complete analysis relating to the procurement variance is not available at this time, the principal causes of the variance in each production area are as follows:

1. *Missile procurement.*—The approved program indicates a net increase of $631 million over the original plan because of the following changes:

a. An additional quantity of missiles and related support for two additional fiscal years;

b. A net capability increase.

c. Additional increases for the following purposes:

(1) Establishment of engineering programs to support missile subsystems during production and after delivery to sustain or improve performance reliability and provide necessary logistical services;

(2) Determination of firm and detailed subsystem production tooling and test equipment requirements and average unit costs on the basis of full design specifications in conjunction with negotiating incentivized procurement contracts with the major production contractors;

(3) Subsystem engineering design changes subsequent to contract execution; and

(4) Development of comprehensive and detailed missile assembly facility equipment and support requirements and subsystem logistic backup, primarily for spares and containers, with contractor assistance and in conjunction with reviewing contractor proposals and negotiating production contracts.

2. *SSBN and tender conversions.*—The approved program represents a net increase of $574 million over the original estimate for the following reasons:

a. Addition of two fiscal years and additional conversions;

b. Determination of hardcore costs of the basic conversion of SSBN hulls to a Poseidon capability with much greater precision as a result of conversion design studies and negotiation of conversion contracts with private shipyards;

c. Decision to procure new equipments for initial SSBN conversions in lieu of modifying certain existing equipment types;

d. Installation of equipment configurations during conversion of earlier class SSBNs to achieve operational uniformity with later classes of SSBNs already converted;

e. CNO requirement for procurement of spare equipment for disaster contingencies;

f. Unforeseen necessity to modify Poseidon fire control equipment for compatibility with improved ASW gear; and

g. Longer conversion durations for certain SSBNs.

3. *Other procurement.*—The net increase of $197 million over the original plan arises from the following major revisions in requirements:

a. Procurement of weapon system tactical equipment for training in support of the 616-class SSBNs excluded from the original plan;

b. Procurement of advanced navigation equipment of an increased accuracy and operational flexibility;

c. Establishment of total actual weapon system logistic support requirements on a detailed and comprehensive basis as an integral feature of negotiating definitized procurement contracts with the principal production contractors;

d. Equipment alterations not foreseen in original planning; and

e. Miscellaneous additional support and replenishment equipment procurements to meet program requirements in the two fiscal years of the approved program beyond the terminal year of the original plan.

(The following correspondence was subsequently supplied for the record by Chairman Proxmire:)

DEPARTMENT OF THE NAVY,
OFFICE OF THE SECRETARY,
Washington, D.C., April 18, 1970.

Senator WILLIAM PROXMIRE,
Chairman, Subcommittee on Economy in Government, Congress of the United States, Washington, D.C.

DEAR SENATOR PROXMIRE: In your letter of March 31, 1970 you refer to testimony given before your Subcommittee on Economy in Government on December 30, 1969 by Mr. Gordon W. Rule, and to Vice Admiral Hyman Rickover's reply with respect to this testimony. You ask if I have any observations to make on this exchange or if I can shed any light on this matter.

I believe Vice Admiral Rickover's comments to be correct when he states that nearly all the pending claims are for the construction of conventionally powered vessels. As you are aware, Mr. Rule testified as an individual at your request, and did not represent the Navy or my office.

The Navy is striving to avoid the origination of claims for any cause, whether they be for nuclear components, other government furnished equipment, or as a result of constructive changes.

I am hopeful that the steps we are taking to avoid recurrence of the current claims situation will be successful, and you can be assured that this matter has my close personal attention.

With kindest regards,

Sincerely,

FRANK SANDERS,
Assistant Secretary of the Navy,
(Installations and Logistics).

SUBCOMMITTEE ON ECONOMY IN GOVERNMENT,
March 27, 1970.

Hon. FRANK SANDERS,
Assistant Secretary of the Navy (Installations and Logistics), Washington, D.C.

DEAR MR. SANDERS: I am enclosing a copy of a letter from Admiral Rickover dated March 25, 1970. This letter is Admiral Rickover's reply to remarks made by Mr. Gordon W. Rule concerning the Navy nuclear propulsion program in the testimony he gave to the Subcommittee on Economy in Government on December 30, 1969.

I would appreciate any observations you might have on Admiral Rickover's assertions in his letter, particularly those concerning shipbuilders' claims relating to late delivery of equipment whose procurement is a responsibility of Admiral Rickover.

As you can see from his letter, Admiral Rickover states that about 90 percent of all pending or anticipated claims under Navy shipbuilding contracts relate to construction of conventional-powered ships, not nuclear ships. He says, "Of the small fraction of the claims which relate to nuclear ships, only one claim, involving about $8 million, relates to late delivery of nuclear propulsion plant equipment. The items involved in this claim were steam plant equipments—not nuclear components."

Any light you can shed on this matter will be deeply appreciated.

Sincerely,

WILLIAM PROXMIRE,
Chairman.

U.S. ATOMIC ENERGY COMMISSION,
Washington, D.C., March 25, 1970.

Hon. WILLIAM PROXMIRE,
U.S. Senate,
Washington, D.C.

DEAR SENATOR PROXMIRE: In our recent telephone conversation you requested that I write you a letter with my comments on remarks made by Mr. G. W. Rule

concerning the Naval Nuclear Propulsion Program in his December 30, 1969 testimony before the Joint Economic Committee.

I have reviewed the transcript of the record of Mr. Rule's testimony and noted that in answer to your questions concerning the current large backlog of contractor claims against Navy shipbuilding contracts, Mr. Rule described the Nuclear Propulsion Program as having been conducted in a "claim breeding manner" and said that there are existing shipbuilder claims against the government because "unrealistic ship delivery dates were set when it was known or should have been known that the nuclear propulsion components for the ships would not be delivered to the yard in time to meet their delivery date."

Contrary to Mr. Rule's testimony there are no such shipbuilder claims. Specifically Mr. Rule testified:

". . . in my looking ahead to areas of future claims I would be a great deal less than candid if I didn't mention to you an area that bothers me considerably and I have really, Senator Proxmire, wrestled with myself as to whether I should mention this area, but I cannot look ahead without seeing this area and, therefore, I want to mention it.

* * * * * * *

". . . what I am referring to specifically is the claim breeding manner in which we have contracted for some of our nuclear propelled vessels in the past.

"From claims now in being, claims that we have before us right now, it is obvious that contracts have been made where unrealistic ship delivery dates were set when it was known or should have been known that the nuclear propulsion components for the ships would not be delivered to the yard in time to enable the yard to meet their delivery date. The result: Claims, and we have them for that reason.

"If these practices are permitted to continue I predict substantial additional claims that the Navy will face from the construction of the CVANs, the DXGNs and other authorized nuclear vessels. It. is very clear indeed to me that the Navy must be firm in its determination to not permit future contracts to contain unrealistic ship delivery dates as tested by the delivery dates of the nuclear component government-furnished material that goes into these ships . . .

* * * * * * *

". . . I, in my statement, sir, have to bear down on this question of late delivery of government-furnished material and primarily the nuclear components that go into these ships, because I know, I have cases in front of me where we have given a contractor a contract to turn out a ship or ships by a certain date, and he is tied to that contract, that date, and we don't supply the nuclear components in time for him to meet that date.

"Now, the minute we do that, the minute we miss that government-furnished material delivery date he has a claim. There is some thinking that he might work around a space where the component is missing from, and theoretically, I guess, that is true. But he has a claim, and what I don't want to see perpetrated is making these contracts with delivery dates that are known to be phony, when you know that the government-furnished propulsion machinery is going to be one year late, and we will make a contract and definitize the contract that we know is just asking for claims."

At the time Mr. Rule testified, the Navy had about 60 pending or anticipated claims under its shipbuilding contracts. These claims totaled about $800 million. As you pointed out in your hearings, Mr. Rule is the chairman of a committee which was established to review these claims. A specific purpose of this committee is to maintain current information on the status of these claims. Thus, I would expect Mr. Rule to be well aware of the fact that nearly all of the pending or anticipated claims under Navy shipbuilding contracts—about 90% of the total—relate to construction of *conventionally* powered ships, not nuclear ships. Of the small fraction of the claims which relate to nuclear ships, only one claim, involving about $8 million, relates to late delivery of nuclear propulsion plant equipment. The items involved in this claim were steam plant equipments—not nuclear components. They were delivered late because of supplier problems in manufacturing the equipment, and not because "unrealistic ship delivery dates were set when it was known or should have been known that the nuclear propulsion components for the ships would not be delivered to the yard in time to meet their delivery dates." No other shipbuilder claims for late delivery of equipment under my cognizance now exist under any of our shipbuilding contracts.

Even including the accelerated construction schedules for the Polaris submarine program, nuclear components have been delivered to support shipbuilding schedules with but a few, isolated exceptions where individual components have been delayed because of unforeseen circumstances, or where unexpected problems have developed after delivery of the equipment. Therefore, I do not understand the basis for Mr. Rule's prediction that the Navy will face substantial additional claims due to late delivery of nuclear components during construction of "the CVANs, the DXGNs, and other authorized nuclear vessels." His prediction is not supported by the historical record. Moreover, the contracts for constructing the CVANs, the DXGNs, and the recently authorized new design submarines have not yet been finalized. The Navy's plans for finalizing these contracts take into consideration the current status of all government and contractor furnished material and design information and include provision for structuring the contracts so as to minimize the possibility of shipbuilder claims arising from late government furnished material or government furnished design information. These plans were discussed with Mr. Rule prior to his testimony before your Committee.

Of course, many problems have arisen during the construction of about 100 nuclear powered submarines and surface warships—ships which have incorporated rapid advancements in technology. Some of these problems have inevitably led to delay in delivery of components and in some cases higher costs of ship construction. I have had to face these problems as they occurred and have had to take whatever action was in the government's best interest according to the circumstances at the time. The timely accomplishment of any complex technical project requires a balancing of risks. Inevitably these risks lead occasionally to delays and higher costs due to unexpected problems which arise as the state-of-the-art is advanced.

"NIMITZ" CLASS ATTACK CARRIER PROGRAM

I would like at this point to discuss in some detail the *Nimitz* class aircraft carriers because that program illustrates some of the points I have just made.

In mid-1964 the Secretary of Defense requested the Atomic Energy Commission to develop a two-reactor nuclear propulsion plant suitable for the *Nimitz* class carriers, the first of which was to be included in the 1967 shipbuilding program. It was recognized at the outset that the transition from the eight-reactor plant with a 3-year reactor core life then installed in the *Enterprise* to a two-reactor plant of about the same total power with a 13-year reactor core life would be a major technological advance. It was also recognized that the first-of-a-kind equipments needed for the two-reactor plant would be the largest ever manufactured for the Naval Nuclear Propulsion Program. Because of the long lead-time required to procure the large, new-design reactor components, and because their delivery controls the ship construction schedule, the Navy in the fall of 1964 requested that advace procurement funds be provided in the FY 1966 budget for the FY 1967 carrier—the *Nimitz*, CVAN68. However, the Department of Defense did not accept this request and decided that all shipbuilding funds for the CVAN68 should be included in the fiscal year 1967 shipbuilding program. The initial shipbuilding funds for the CVAN68 thus were made available to the Navy in July 1966, one year later than the Navy requested to support its desired completion date for this ship.

Due to the difficulty encountered in obtaining adequate industrial support to manufacture the nuclear propulsion plant components on a schedule supporting the *Nimitz* construction schedule, the Naval Ship Systems Command in 1967 obtained approval to assign the highest industrial priority to the *Nimitz* propulsion plant. This propulsion plant is being procured on a very tight schedule through four prime contractors, about fifty major suppliers and over one-thousand sub-tier contractors.

Procurement of nuclear propulsion plant equipment for the *Nimitz* is now well into the production phase. Delivery of the first of the nuclear components has taken place. Completion of all nuclear propulsion plant component deliveries is expected in 1972. Many of the large nuclear propulsion plant components will be delivered and installed this year. However, solution of development and production problems including labor strikes in several factories has delayed some components so that delivery of the *Nimitz* will probably be extended from 1972 to 1973.

Nuclear propulsion plant components for the second carrier of the class, the *Dwight D. Eisenhower* CVAN69, will come off production lines right after components for the *Nimitz* and will therefore be in time to support the construction schedule for the *Eisenhower*. However, since the two ships are being constructed in series in the same shipyard and have to use the same limited drydock and pierside facilities, delay in the *Nimitz* could also delay the *Eisenhower*. The Naval Ship Systems Command is working with the shipbuilder to arrange the shipbuilding schedules so as to build both ships at minimum cost.

The *Nimitz* is presently scheduled to be delivered to the Fleet in 1972 and the *Eisenhower* in 1974. As I indicated above, these schedules may be delayed about a year. If the Congress approves the Department of Defense FY 1971 budget request for advance procurement funds for the third *Nimitz* class carrier, the CVAN70, and fully funds that carrier in FY 1972, it is expected to be delivered to the Fleet in 1977, even considering possible delays in the first two ships.

The Navy thus considers it necessary to proceed with advance procurement for the CVAN70 in FY 1971 as presently planned, not only to prevent further delay to the ship, but also to avoid having to shut down the special production lines which have been established specifically to manufacture the nuclear components needed for *Nimitz* class aircraft carriers. In this regard, it should be remembered that procurement of long lead material for the *Eisenhower* was started in July 1967. Even with FY 71 advance procurement funding, we are not able to initiate procurement for the CVAN70 until July 1970 at the earliest—three years after start of procurement for the *Eisenhower*.

From the above discussion, I am sure you can appreciate that the development, procurement and delivery of nuclear components must be carefully planned and funded to take maximum advantage of technological advances, to obtain the necessary industry capacity, and to meet shipbuilding schedules. It is not simply a matter of ordering components to be delivered by a specified date.

DXGN NUCLEAR-POWERED GUIDED-MISSILE FRIGATE PROGRAM

With respect to the nuclear-powered guided-missile frigate DXGN program (now called the DLGN38 class), all nuclear components are prisently expected to be delivered in time to support orderly ship construction for those ships for which funds have been appropriated.

HIGH SPEED NUCLEAR ATTACK SUBMARINE PROGRAM

The original schedules set over a year ago for our new design high speed submarine program (SSN688 class) were predicated on the premise that the highest industrial priority would be assigned to this program. However, the Navy has not yet been successful in obtaining approval for such a priority, although the Department of Defense recently agreed to seek approval of this priority for selected items on the first ship of the class. As a result, the submarine delivery schedules have recently been revised to reflect the time that has elapsed without this priority. As noted above, our contracting plans take into consideration the current status of all Government and contractor furnished material and design information. Therefore this delay in ship deliveries will be accommodated in initial ship contracts and will not be a valid basis for shipbuilder claims. It will however, result in somewhat higher ship costs due to inflation occurring during the delay.

I hope that the information in this letter will help to clarify the record concerning naval nuclear propulsion matters. If you have questions or desire amplification of any point I have made, please do not hesitate to ask.

Please know that I deeply appreciate the support you have given over many years to the Naval Nuclear Propulsion Program.

Respectfully,

H. G. RICKOVER.