

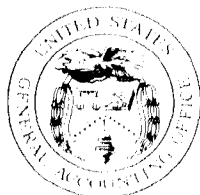
GAO

Report to the Chairman, Subcommittee on
Defense, Committee on Appropriations,
U.S. Senate

January 1989

TORPEDO PROCUREMENT

Issues Related to the Navy's MK-50 Torpedo Propulsion System



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National Security and
International Affairs Division

B-217988

January 27, 1989

The Honorable Daniel K. Inouye
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

Dear Mr. Chairman:

The Senate Committee on Appropriations Report on the Fiscal Year 1988 Department of Defense (DOD) Appropriation Bill (Rept. 100-235, Dec. 4, 1987) suggested that substantial savings might be realized if the Navy were to provide MK-50 torpedo boilers to prime contractors as government furnished equipment (GFE). (The boiler is one of the components of the propulsion system.) Subsequently, your Office asked us to review the cost and merits of the Navy separately procuring MK-50 torpedo propulsion components, focusing on the following questions.

- Would the Navy save money by separately procuring the MK-50 torpedo propulsion system or selected components of it and providing them to the prime contractor as GFE?
- If separate procurement of MK-50 components is a good idea, when should the Navy implement this procurement strategy?
- Would providing components of the MK-50 propulsion system to the contractor as GFE affect the prime contractor's warranty?

This report responds to those questions. Appendix I contains more details on our objectives, scope, and methodology.

Background

The MK-50 is an advanced lightweight torpedo intended to counter Soviet submarine threats through the year 2000. The program is in full-scale development under a contract with the Underseas Systems Division of Honeywell, Incorporated. Allied Signal (formerly Garrett) is Honeywell's major subcontractor for the propulsion system.

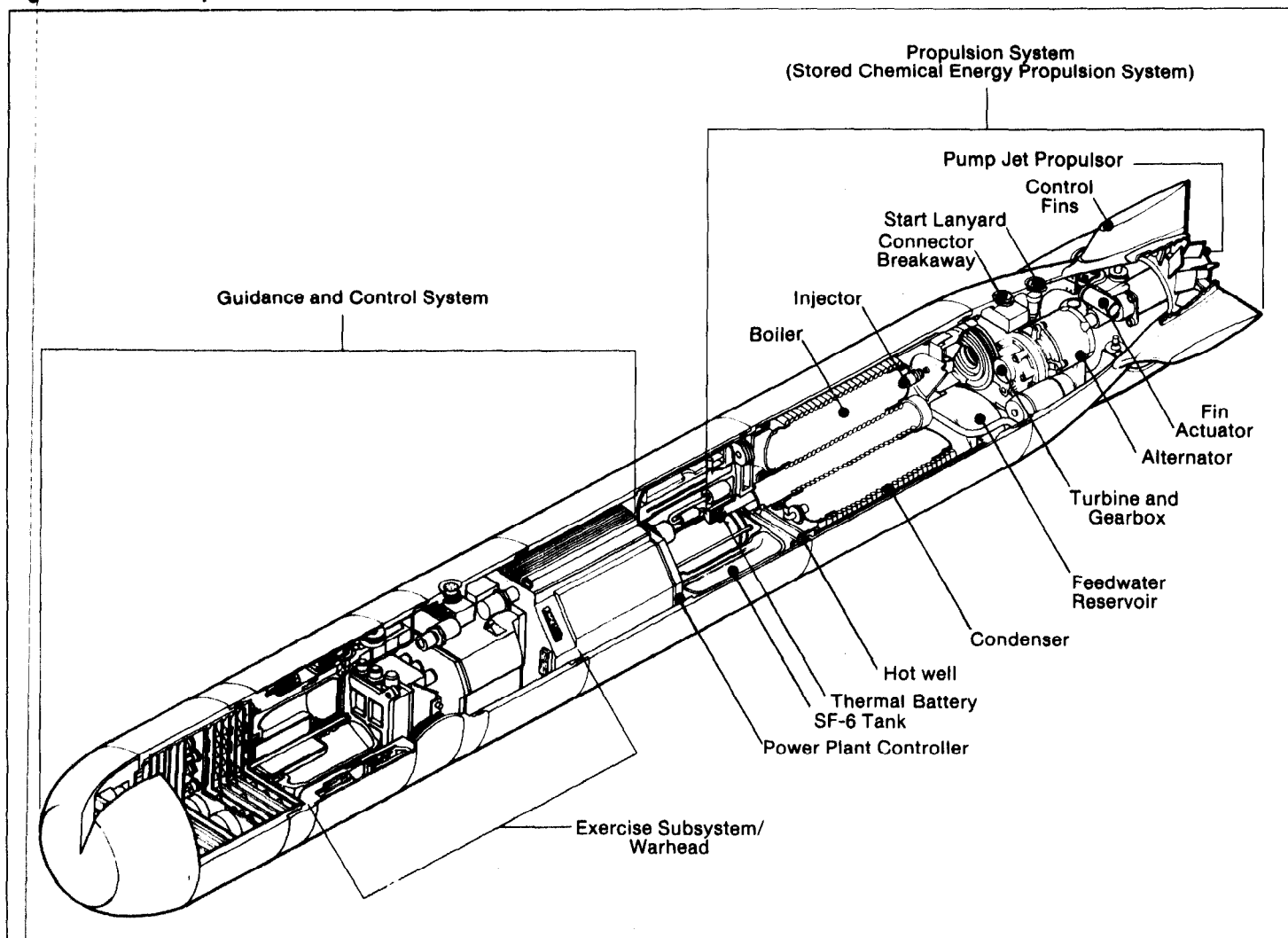
DOD plans to make a decision on whether to proceed to low-rate initial production (milestone III-A) by the spring of 1989 and acquire low-rate production torpedoes in two phases—phase I in fiscal year 1989 and phase II in fiscal year 1990. The Navy plans to award low-rate initial production contracts to both Honeywell and Westinghouse Electric

Corporation using a leader/follower strategy. This strategy will be accomplished by having Honeywell, the primary developer of the MK-50 torpedo, assist the Navy in providing Westinghouse with the capability of producing the MK-50. Under the current arrangement, Westinghouse will have its own subcontractor—Argo-Tech—produce the propulsion system for its torpedoes during low-rate initial production. Both contractors will produce about the same number of torpedoes during low-rate initial production.

Under its currently planned dual-source acquisition strategy, the Navy plans to award full-production contracts during fiscal year 1991 with a 60/40 to 70/30 percent quantity split. The Navy will award full production quantities to the contractors on the basis of bid price and past performance history, and each prime contractor will be expected to produce the entire torpedo. The Navy estimates total development, procurement, and military construction costs at about \$6.6 billion (then-year dollars) for torpedoes and associated equipment.

The MK-50 will use a new type of propulsion system, known as a closed-cycle stored chemical energy propulsion system, that will enable the torpedo to go faster and deeper than the current lightweight torpedo. The propulsion system is that section of the torpedo behind the command and control subsystem, or "forebody." As shown in figure 1, the system consists of 15 separate components and is sometimes referred to as the "afterbody."

Figure 1: MK-50 Torpedo



Cost Savings Associated With Separate Procurement of Propulsion System

The Navy, as well as the other services, sometimes separately procure components of a weapon system and provide them to the prime contractor as GFE on the basis that such a procurement strategy saves money. These savings occur because the prime contractor's overhead costs are not added to the components provided as GFE and/or because the government may buy a larger quantity than the prime contractor and thus obtain a lower price.

The Federal Acquisition Regulation allows the procuring agency considerable discretion as to when it should provide GFE to a contractor. The basic policy stated in the regulation is that contractors should furnish all material needed to perform government contracts. However, the regulation provides that agencies should furnish material to a contractor when necessary to achieve significant economy, standardization, expedited production, or when it is otherwise in the government's interest. For example, the Navy plans to directly furnish two components for the MK-50 torpedo program—the AN/AYK-14 computer and the MK-714 shipping container—as GFE because more than one weapon program uses them. Thus, economies can be achieved on these components. Your Office questioned whether such a procurement strategy would be appropriate for the MK-50 torpedo propulsion system or components of it, and if so when this strategy should be employed.

As previously stated, the MK-50 torpedo program is currently in full-scale development, and a decision on whether to proceed to low-rate initial production will be made by the spring of 1989. In anticipation of this decision, the Navy, awarded a \$66.6 million contract for long-lead material and other support and test equipment to Honeywell in October 1988. In December 1988 a similar contract was awarded to Westinghouse for \$49.3 million for long-lead material and 10 qualification torpedoes. These contracts included separately priced low-rate initial production options for 76 torpedoes from Honeywell and 64 torpedoes from Westinghouse that may be exercised after the milestone III-A decision is made but not later than May 31, 1989. According to Navy officials, technology transfer from Honeywell to Westinghouse will continue during the low-rate production phase.

Since production of the MK-50 will not begin until the spring of 1989, conceptually it may be possible for the Navy to test an alternative procurement strategy of providing the propulsion system or components of it to prime contractors during low-rate initial production. Sufficient propulsion system design data were available for both Honeywell and Westinghouse to include separately priced low-rate initial production options in their recently signed contracts with the Navy. Thus, it may be possible for the Navy to contract directly with Allied Signal and Agro-Tech for the propulsion system or components of it during the low-rate production phase of the program. However, this may not be the most appropriate time to test these alternatives for a number of reasons.

- First, data needed to determine whether cost savings would occur by using an alternative procurement strategy are not yet available. Honeywell officials informed us that its price proposal for the low-rate initial production option was based on a continuation of the current MK-50 torpedo procurement strategy whereby the prime contractor would provide the entire torpedo. If this were to change, its price proposal would most likely change.
- Second, Navy officials believe that such a substantive change in the procurement strategy at this time would delay the torpedo program—requests for proposals would have to be reissued, proposals evaluated, and contracts negotiated and awarded, with no reasonable assurance that savings would occur.
- Finally, since technology transfer for the closed-cycle propulsion unit is to continue through low-rate initial production, Navy officials believe this technology transfer process would be much more difficult and uncertain if its current procurement strategy were interrupted at this time.

According to MK-50 torpedo program officials, the Navy will have more detailed drawings of the propulsion unit by the time it is ready to seek bids for full-rate production in December 1989. While it may be possible to test an alternative procurement strategy for the MK-50 before December 1989, for the reasons indicated above, it may not be practical. Based on our evaluation of the current program status, we believe that a more appropriate time to assess other procurement strategies for this program is when bids are sought for full-rate production. Whereas the Navy plans to buy 140 torpedoes during low-rate initial production, it plans to buy several thousand torpedoes during full-rate production. (The exact number is classified.)

Navy officials stated that, in their opinion, either alternative procurement strategy—breaking out the entire propulsion unit or components of it for a separate procurement—would be impractical, even for full-rate production. They said that separate procurement of the propulsion unit or components of it would greatly increase the administrative work load and would result in increased cost and risk. According to Navy MK-50 program officials, the added cost and risk arise from the need to increase program staff resources to procure GFE, monitor the contract, and ensure that the components acquired meet specifications and are provided when the prime contractor needs them. They also noted that if timely delivery of GFE components did not occur, the prime contractor could claim compensation for work disruptions or delays.

Navy program officials believe that the currently planned leader/follower procurement strategy is a more cost-effective strategy than breaking out components for separate procurement because competition between two sources is expected to result in greater cost savings. However, it should be noted that once the technology transfer has occurred, the Navy could still have competition between the two contractors who are now teamed with Honeywell and Westinghouse.

In addition to the boilers needed by the prime contractors for production line assembly, the Navy will need spare boilers for fleet exercises. The Navy's current plan is to have the prime contractors buy the production-line boilers from their suppliers (Allied Signal and Argo-Tech) and obtain spare boilers in a separate procurement action, which will be open to competition among all contractors.

Effect of MK-50 Breakout on Contractor's Warranty

If the Navy decides to furnish the propulsion system or components of it as GFE, the supplying contractors, not the prime contractor, would be held accountable for meeting contract design, manufacturing, and performance requirements for those items.

Navy procurement policy requires contractors to meet warranty obligations as a part of the contract. Accordingly, the request for proposal for low-rate initial production does not require the contractor to separately price the warranty. MK-50 program officials said that product design, manufacturing, and performance warranty considerations for the entire torpedo are included in the contract target price and that the Navy does not anticipate additional warranty costs.

The contractor's warranty period covers 1 year after final acceptance of the item by the government, except for support/ test equipment and the test set. The warranty for these two items is limited to 3 months after installation and check-out. Both of these time frames are specified in the Navy's request for proposal. Final acceptance decisions will occur after there is a full in-water testing of the torpedo. According to program officials, the torpedoes will be sent to the fleet after the testing. There is no formal plan for further testing of the torpedoes during the warranty period. In its comments on our draft report, the Navy agreed, but stated that a significant portion of the MK-50 torpedo inventory will be used in fleet exercises during the warranty period. The Navy said that it would analyze data and trends from these fleet exercises and take whatever action is/may be appropriate under the warranty.

Although the government may obtain a warranty from the supplier(s) of GFE items, the prime contractor for the torpedo would not be held accountable for the design, manufacturing, and performance requirements of the GFE items. The prime contractor would be responsible for proper installation of the GFE items. However, if a GFE item were modified by the prime contractor to meet design and performance requirements, the contractor's warranty would extend to such work.

Conclusion

Because of the manner in which the Navy has structured the MK-50 torpedo procurement, we believe that the most appropriate time for the Navy to determine whether it could save money by separately procuring the MK-50 propulsion system or components of it and providing them to the contractor as GFE is when it seeks bids for full-rate production.

Agency Comments and Our Evaluation

DOD agreed with the findings of our report but reemphasized its belief that added cost and risk to the government would occur if the current dual-source procurement strategy for the MK-50 was changed. DOD said that at the appropriate time it would review our suggestion that component breakout procedures be considered. (See app. II for a complete text of DOD's comments.)

Unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days after its issue date. At that time we will send other copies to interested Congressional committees and members of the Congress; the Secretaries of Defense and the Navy; and the Director, Office of Management and Budget. Copies will be made available to other interested parties on request.

This report was prepared under the direction of John Landicho, Senior Associate Director. Other major contributors are listed in appendix III.

Sincerely yours,



Frank C. Conahan
Assistant Comptroller General

Objectives, Scope, and Methodology

The Senate Committee on Appropriations Report on the Fiscal Year 1988 DOD Appropriation Bill (Rept. 100-235, dated December 4, 1987) stated that substantial savings may be obtained if the Navy were to provide MK-50 torpedo boilers to prime contractors as GFE. Subsequently, we were asked to examine the cost and merits of the Navy separately procuring MK-50 torpedo components, focusing on the following questions.

- Would the Navy save money by separately procuring the propulsion system or selected components of it and providing them to the prime contractor as GFE?
- If separate procurement of these components is a good idea, when should the Navy implement this procurement strategy?
- Would providing components of the propulsion system to the contractor as GFE affect the prime contractor's warranty?

Our review was performed during April and May 1988. During our review, we discussed the Navy's planned dual source competition for the entire torpedo and the effect any changes to this strategy would have on program costs with officials from the Navy and Honeywell (the prime contractor for torpedo development). Also, to obtain a perspective on how different procurement strategies could affect program costs, we reviewed Navy data concerning the torpedo developmental phase and Navy and DOD policies relating to cost estimating. Although the Navy used MK-50 developmental costs to project production costs, it did not make a formal "Should Cost Production Study," nor did it perform cost comparisons using separate component procurements. As a result, we could not verify the Navy's projected production costs or its prediction that program costs would increase if propulsion components were provided as GFE.

To determine how the warranty may be affected, we analyzed the warranty clauses provided in the Navy's request for proposal for low-rate initial production of MK-50 torpedoes. We then compared these clauses to legislation, the Federal Acquisition Regulations, and Navy and DOD policies relating to weapon system warranties to identify any inconsistencies. We also reviewed the Federal Acquisition Regulations to determine the criterion to be used in decisions about the appropriateness of providing GFE to prime contractors and our reports¹ on warranty and contracting issues.

¹DOD Warranties: Improvements Needed In Implementation of Warranty Legislation (GAO/NSIAD-87-122, July 21, 1987) and Procurement: Better Compliance With The Competition in Contracting Act is Needed (GAO/NSIAD-87-145, Aug. 26, 1987).

Comments From Assistant Secretary of Defense (Acquisition and Logistics)

Note: GAO comment supplementing those in the report text appears at the end of this appendix.



DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

WASHINGTON, DC 20301-3010

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report entitled, "MK-50 TORPEDO: Issues Related to Acquisition of the Propulsion System", Dated September 28, 1988 (GAO Code 394257), OSD Case 7785.

It is premature for the Department to comment on the GAO matters offered for consideration by the Subcommittee. The Department will, at the appropriate time, review these suggestions under DoD component breakout procedures and policies.

The detailed DoD comments on the report findings are provided in the enclosure. Thank you for the opportunity to comment on the draft report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Robert C. Duncan".

Robert C. Duncan

Enclosure

GAO DRAFT REPORT - DATED SEPTEMBER 28, 1988
(GAO CODE 394257) OSD CASE 7785

"MK-50 TORPEDO: ISSUES RELATED TO ACQUISITION
OF THE PROPULSION SYSTEM"

DEPARTMENT OF DEFENSE COMMENTS

FINDINGS

FINDING A: Background. MK-50 Program. The GAO explained that the MK-50 is an advanced lightweight torpedo, intended to counter Soviet submarine threats through the year 2000. The GAO further explained that the MK-50 will have a closed-cycle stored chemical energy propulsion system, that will enable the torpedo to go faster and deeper than the current lightweight torpedo. The GAO reported that the program is in full-scale development under a contract with the Underseas Systems Division of Honeywell Incorporated; and Allied Signal (formerly Garrett) is the major subcontractor for the propulsion system. The GAO found that the Navy will split production of the MK-50 between Honeywell and Westinghouse Electric Corporation, using a leader/follower strategy. According to the GAO, this will be accomplished by having the primary developer of the MK-50 torpedo (Honeywell) assist the Navy in providing the second contractor (Westinghouse) with the capability of producing the torpedo. The GAO noted that Westinghouse will have its own subcontractor (Argo-Tech) produce the propulsion, in preparation for the FY 1991 competition on full-rate production. According to the GAO, the Navy will award full production quantities to the contractors on the basis of bid price and past performance history. The GAO reported that the Navy estimates total development, procurement and military construction costs at about \$6.6 billion (in then-year dollars) for torpedoes and associated equipment. (pp. 2-3/GAO Draft Report)

DOD RESPONSE: Concur.

FINDING B: Cost Savings Associated with Separate Procurement of Propulsion System. The GAO found that the Navy does not expect to have detailed drawings sufficient to seek competitive bids from other than the current contractors/subcontractors (Honeywell/Allied Signal and Westinghouse/Argo-Tech) until December 1989. The GAO concluded that, consequently, data needed to determine potential cost savings by using the alternative procurement strategy of directly procuring the entire propulsion system or separate components is not yet available. The GAO reported that, according to the Navy, breaking out either the entire propulsion system or components for separate procurements would greatly increase the administrative workload and would result in increased program cost and risk. The GAO further reported that, also according to

Enclosure

Now on pp. 1-2

**Appendix II
Comments From Assistant Secretary of
Defense (Acquisition and Logistics)**

the Navy, the added cost and risk arise from the need to increase program staff resources to:

- procure Government furnished equipment (GFE);
- monitor the contract; and
- assure that the items acquired meet specification and are provided at the time the prime contractor needs them.

The GAO reported that the Navy plans to provide two components--the AN/AYK-14 computer and the MK-714 shipping container--as GFE because more than one weapons program uses them and, as a result, economies of scale can be achieved on these items. The GAO concluded that, in the future, additional economies of scale might be achieved with regard to MK-50 torpedo boilers. The GAO pointed out that, in addition to the boilers needed by the prime contractors for production line assembly, the Navy will need spare boilers for fleet exercises. The GAO found that the current Navy plan is to have the prime contractors buy the production-line boilers from their suppliers--Allied Signal and Argo-Tech. The GAO noted that, according to Navy officials, if the boilers were provided as GFE for production torpedoes, the prime contractor would be responsible only for their proper installation; the Government would be responsible for procurement, timely delivery and equipment performance. (pp. 4-7/GAO Draft Report)

Now on pp. 3-6

DOD RESPONSE: Concur. It should be emphasized however, that any Navy procurement of MK-50 torpedo components is presently anticipated to cover parts to be used for maintenance, etc. for torpedoes in the Navy inventory. It is not planned to extend Government procurement of MK-50 torpedo components so as to provide them to the prime contractors as Government furnished material (GFM). There is concern that changing the MK-50 torpedo acquisition strategy in that way would result in increased risk of claims against the Government for non-conforming parts, late delivery, etc. It is also emphasized that additional project office administrative staff would be required to manage the additional effort associated with assuring timely delivery of quality components to the prime contractor. Finally, increased cost, schedule, and performance risk could be expected because of dilution of total system responsibility on the part of the prime contractors.

FINDING C: Effect of MK-50 Breakout on Contractor's Warranty. The GAO reported that, according to MK-50 program officials, product design, manufacturing and performance warranty considerations for the entire torpedo are included in the contract target price and the Navy does not anticipate additional warranty costs. The GAO explained that the contractor warranty period covers 1 year after final acceptance of the item by the Government, except for support/test equipment and the test sets, which are limited to 3 months after

**Appendix II
Comments From Assistant Secretary of
Defense (Acquisition and Logistics)**

installation and check-out. The GAO further explained that final acceptance decisions will occur after there is a full in-water testing of the torpedo, at which time the torpedoes will be sent to the fleet. The GAO found that there is no formal plan for further testing of the torpedoes during the warranty period. The GAO noted that, although the Government may obtain a warranty from the supplier(s) of GFE items, the prime contractor for the torpedo would not be held accountable for the design, manufacturing, and performance requirements of the GFE items, but would be responsible for their proper installation. The GAO concluded, however, that if a GFE item was modified by the prime contractor to meet design and performance requirements, the contractor's warranty would extend to such work. (pp. 8-9/GAO Draft Report)

DOD RESPONSE: Concur. There is no formal plan, under the contract, for additional testing after acceptance. However, during the warranty period, a significant portion of the inventory will be used in fleet exercise testing. The Navy will analyze data and trends from fleet exercise testing and take any appropriate action. This will include sample testing by production lot, if necessary, and making appropriate use of warranty.

FINDING D: Matters for Consideration by the Subcommittee. The GAO again observed that the Navy does not expect engineering drawings with sufficient detail to seek competitive bids for the propulsion system to be available until December 1989. The GAO suggested that, at that time, the Defense Subcommittee (Senate Committee on Appropriations) may want to ask the Navy to assess potential cost savings by issuing a request for proposal for full production, which includes bids under the following acquisition strategies:

- the current contractor/subcontractor approach for the entire torpedo acquisition;
- Government contract for the forebody and provision of the entire afterbody as GFE; and
- the current contractor/subcontractor approach, with the Government providing certain afterbody components as GFE. (pp. 9-10/GAO Draft Report)

DOD RESPONSE: It is premature for the Department to respond to the matters proposed for consideration by the Subcommittee. At the appropriate time, the GAO suggestions will be reviewed under DoD component breakout procedures and policies.

RECOMMENDATIONS

NONE.

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See comment 1.

**Appendix II
Comments From Assistant Secretary of
Defense (Acquisition and Logistics)**

The following is GAO's comment on DOD's letter dated November 30, 1988.

GAO Comment

1. In view of DOD's comments, the matters for consideration by the Subcommittee were deleted from the final report.

Major Contributors to This Report

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