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

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B-159896

JAN 17 1974

The Honorable William Proxmire
Vice Chairman, Joint Economic Committee
Congress of the United States

Dear Mr. Vice Chairman:

In response to your July 24, 1973, request, we followed up on our earlier assessments of the Army and Navy should-cost studies (B-159896, Oct. 30, 1972, and May 15, 1973).

NAVY SHOULD-COST STUDIES

You requested us to determine whether:

--MK-48 unit costs have increased, decreased, or remained the same from the time of the estimates in the proposals for the first production contract.

--The should-cost findings have been employed in negotiations for any follow-on production contracts.

--The recommendations the should-cost team made have been implemented, and, if so, whether any correlation can be made between the improvements and any changes in MK-48 costs.

--The Navy has implemented the recommendations in our May report and plans further should-cost studies.

Mark 48 cost trends

A comparison of the unit costs for the torpedo main assembly and tank section and total unit costs indicates that costs for the MK-48 torpedo have decreased significantly since the initial proposals for the first production buy. Since the quantity and type of items included in the contract costs for the first and second buys differed, we adjusted the unit costs to compensate for these differences.

The results of our comparison follows:

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	Unit Costs			
	Main assembly	Tank section	Other	Total
First production buy (July 1971):				
Contractor's proposal	$167,200	$10,000	$58,800	$236,000
Negotiated	146,600	9,900	56,900	213,400
Second production buy (May 1973):				
Contractor's proposal	134,900	6,400	24,200	165,500
Negotiated	123,400	6,000	21,100	150,500

As of September 30, 1973, the adjusted target cost for the first production contract was $104.5 million. There are additional authorized changes and spare parts orders for which price adjustments have not yet been negotiated. The contractor's cost performance report indicates that these changes and spares orders will increase contract target costs to $122.1 million. With 67 percent of the scheduled deliveries completed, the contractor estimated the final contract costs will total $114.4 million, resulting in a cost underrun of about $7.7 million.

If this underrun materializes, the actual unit cost for the first production buy will be about $205,000, excluding torpedo spares. Under the incentive features of the contract, 70 percent of any savings resulting from an underrun will accrue to the Navy. However, any projected underrun could be offset by cost increases resulting from changes in the scope of work or changes to correct torpedo defects disclosed during acceptance testing by the Navy.

Use of should-cost findings in follow-on negotiations

The second production contract was negotiated in February and March 1973, about 22 months after the should-cost study was completed. The study findings, therefore, were used largely for comparison purposes in assessing the reasonableness of the results of more current Government analyses. For

example, the Defense Contract Administration Services (DCAS) engineer assigned to evaluate the direct labor hours proposed for the second buy used the should-cost findings as one of several references to support his conclusion that the contractor's proposed labor hours could be reduced.

The Navy negotiator told us that, in addition to considering experience on the first production contract, Defense Contract Audit Agency (DCAA) and DCAS reviews were the primary basis for negotiating the follow-on contract price. The negotiation records and our discussions with the Navy negotiator indicate that the should-cost estimates were also considered during negotiations. The Navy's negotiation records show that, with certain adjustments, the estimates compared very favorably with the Navy's negotiation objectives for the second production contract.

Implementation of should-cost recommendations

The contractor has made a number of improvements in those areas which the should-cost team considered in need of attention. The Navy and local government representatives indicate that the contractor has made satisfactory progress in implementing the recommendations except for those relating to the cost accounting system, which has not been accepted by the DCAA resident auditor. Although we could not quantify savings directly related to each should-cost recommendation, we believe the improvements in the contractor's operations discussed below have contributed to reducing Mark 48 production costs.

Finalize plant space requirements, detail layouts, and associated make-or-buy plan

The contractor, by increasing plant space and revising its layouts in Mechanical and Electronic Assembly, has provided the capability to supply torpedoes at contracted delivery rates. The increase in plant space has enabled the contractor to finalize its make-or-buy plans during the first production buy. The contractor indicated that it continually monitors its make-or-buy plans and makes those changes which

are cost beneficial. For example, the contractor is changing its plans for the third production buy. It estimates that these changes--to make, rather than buy, the fuel tank, steering assembly, and gyro pages--will save up to $770,000.

Design and implement cost accounting systems

The contractor has designed and implemented a cost accounting system which provides cost by contract, lot, and specific contract line items but does not identify costs relating to changes or modifications for specific torpedo components. DCAA is pursuing the required improvements as part of its scheduled followup reviews of the cost system.

Establish improved labor control systems

Labor control improvements have been made and are continuing to be made in upgrading existing standards and replacing engineering estimates with standards based on time studies. The contractor plans to have 85 percent of the time-studied standards established by 1975, and all time-studied standards established by 1977. The contractor has improved and is continuing its capability to use numerical control machines. These improvements should lead to reduced machining time and, in some cases, higher quality production.

Complete development of and implement production control systems

A production control system has been implemented which appears to satisfy the recommendation and which supports the company's ability to produce torpedoes at the required delivery rate. The system should give the contractor a better capability to project torpedo deliveries and the inventory levels necessary to maintain a steady and continuous flow of work through production. As of November 1973, the contractor projected that 480 torpedoes will be delivered under the first production contract by January 1974--only 1 month behind schedule.

Complete development of and implement quality control data feedback systems

The contractor has increased its use of electronic data processing equipment to provide quality feedback information useful to quality control and management. It has installed a microfilm library of test and inspection records and other related data.

Revise inspection and test procedures

The contractor has made efforts to identify redundancies in assembly and inspection test labor. In some cases, this has resulted in labor-hour reductions. The total reductions could not be readily determined. The contractor believes the greatest savings will result from use of automatic test equipment and improvements in production methods. For example, the contractor converted from manual to automatic procedures on one testing operation in September 1973 and estimates annual savings of $25,000.

Concentrate on design-related problems

The contractor has been concentrating on the design problems noted by the should-cost team and is continuing to make improvements. For example, man-hours to produce the comb filter on the first buy have been reduced by about 80,000.

Future should-cost plans and Navy comments on GAO recommendations

We were informed that no studies have been initiated or planned since those of the MK-48 torpedo contractors.

In its August 14, 1973, letter commenting on our May report (see enc. I), the Navy stated that it intended to review its should-cost policy and give full weight and consideration to our recommendations, including greater use of the should-cost approach in the future. On October 9, 1973, the Navy issued a procurement policy memorandum (see enc. II) clarifying its policy for applying should-cost studies to weapon systems acquisitions.

We recommended that, when possible, should-cost studies be performed by a team of Government personnel responsible for conducting the study and negotiating the contract price. The Navy memorandum does not show a preference for this approach but states that studies can be made by either Government or non-Government personnel. We do not believe a study must be performed by Government personnel. However, as pointed out in our May report, this approach will not only strengthen the Government's bargaining position in negotiations but will also establish a group of experienced personnel for future studies. We also recommended that Government representatives at the contractor's plants be assigned the responsibility for monitoring the contractor's progress in implementing the should-cost team's recommendations. The memorandum does not comment on this.

We do not believe the Navy's policy statement will encourage procuring activities to make increased use of the should-cost approach. The criteria for selecting procurements for study and decisions regarding the scope and timing of the studies have been left largely to the services to determine. We believe the Department of Defense should take a more active role in (1) establishing the criteria as to when should-cost studies should be performed and (2) monitoring the effectiveness of the studies. We intend to convey these views to the Secretary of Defense.

ARMY SHOULD-COST STUDIES

You requested us to followup on the steps taken following the Army should-cost studies reported on in our October report by (1) determining whether the six contractors had implemented the improvements recommended by the should-cost teams and whether any savings had resulted, (2) verifying the unit price changes in the TOW missile program, and (3) determining whether the Army has implemented our recommendations and whether it has initiated or plans further should-cost studies.

Implementation of should-cost recommendations and savings realized

The management improvement programs accepted by the six contractors concerned such tasks as preparing estimating

manuals or improving material control. In some cases, goals were established for improvement in such areas as labor efficiency, labor hours, and indirect expenses. The contractors agreed to apply their best efforts to accomplishing the tasks and attaining the improvement goals and to submit reports quarterly to the procuring agencies on the progress made toward these goals.

An analysis of the progress the contractors reported recently follows.

Type of goal or task	Number fully achieved	Number not fully achieved	
		Some improvement reported	No improvement reported
Improved labor efficiency rates	5	4	-
Reduced labor hours	2	9	1
Reduced indirect cost rates (note a)	5	3	5
Improved procedures	4	2	-
Organizational changes	2	-	-
	18	18	6

[a]Data was not available at the time of our review to show progress for two additional indirect cost rate goals.

Final prices have not been negotiated for any of the contracts awarded to the six contractors although three of them have completed deliveries of the principal hardware items. According to information they provided, five contractors expect final costs to be lower than the contract target costs.

Contractor (note a)	Number of goals or tasks: Fully achieved	Not fully achieved: Some improvement reported	Not fully achieved: No improvement reported	Estimated Cost overrun or underrun(–)
				(000 omitted)
A	2	11	3	$ –637
(2 contracts)				–1,192
C	5	-	-	–996
D	6	1	3	2,051
G	3	2	-	-
H	1	3	-	–837
I	1	1	-	–1,031
Total	18	18	6	

[a]The letters shown in this column correspond to those shown for the contractors in our October report.

As for potential savings beyond the contracts for which the should-cost studies were conducted, follow-on procurements had been placed with only three contractors. In these contracts, target unit prices for the principal hardware items decreased by 4.3, 21.1, and 26.3 percent, respectively.

Unit prices for the TOW missile

Army records indicate that the unit prices you cited relate to production of missiles by the development and primary production contractor. The Army has also awarded production contracts to a second source to introduce competition into the procurement of this weapon system.

Prior to the Army should-cost studies, a fixed-price incentive contract was awarded to the primary contractor at a unit target price of $5,070.35 and a firm-fixed-price contract was awarded to the second source at a unit price of $5,064.66. Modifications to these contracts have increased

the unit prices for the primary contractor and second-source contractor to $5,531.65 and $5,514.21, respectively.

Following should-cost studies of both contractors' operations in 1971, the Army requested revised proposals from each contractor for various quantities of missiles. The primary contractor was subsequently awarded a firm-fixed-price contract at a unit price of $3,670. A letter contract, which was definitized later as a firm-fixed-price contract at a unit price of $4,170, was awarded to the second source.

The next procurement of TOW missiles was a winner-take-all competition for a multiyear contract. A firm-fixed-price contract with a unit price of $2,127 was awarded in November 1971 to the primary contractor.

The following factors should be considered when comparing the trends in TOW missile and MK-48 torpedo unit prices:

--A second source was developed for the TOW missile which introduced competition for the last two contracts.

--Substantially more TOW missiles have been produced, which provides a greater base for amortizing fixed costs and a greater potential for realizing production economies.

--MK-48 unit prices are negotiated targets; final prices are to be established after contract completion. The TOW missile unit prices are firm-fixed-prices on the later contracts.

Army comments on GAO recommendations and future should-cost plans

To increase the benefits from future should-cost studies, we recommended in our October report that the Secretary of the Army insure that should-cost teams

--place increased emphasis on analyzing the contractors' operations to identify specific actions needed to improve efficiency and to reduce costs;

--make a greater effort to encourage the contractors' increased cooperation through earlier discussions of the teams' findings;

--give sufficient attention to identifying opportunities for savings through modifications in Government policies, procedures, and practices; and

--define improvement goals, whenever possible, in terms which permit meaningful evaluations of contractors' progress toward the goals.

Headquarters, Army Materiel Command (AMC), officials said the Army Procurement Research Office is revising the should-cost regulation and manual, paying particular attention to our recommendations. They expect the revised regulation to be completed during December 1973 and the manual during January 1974. Meanwhile, AMC officials advised that the buying commands and the should-cost training staff have received copies of our report as well as Army correspondence indicating concurrence with our recommendations.

Army records show that through fiscal year 1973 22 should-cost studies have been completed and used in contract negotiations; 9 more are in process or planned during fiscal year 1974.

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We have discussed our work at each location with the contractors, local government representatives, and Army and Navy officials. However, we did not request written comments from the contractors or agency officials.

We plan no further distribution of this report unless you agree or publicly announce its contents.

Sincerely yours,

Comptroller General
of the United States

Enclosures - 2

ENCLOSURE I

DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20350

14 AUG 1973

Mr. Richard W. Gutmann, Director
Procurement and Systems Acquisition Division
United States General Accounting Office
441 G Street, N. W.
Washington, D. C. 20548

Dear Mr. Gutmann:

The Secretary of Defense has asked the Department of the Navy to reply to your report B-159896 of 15 May 1973 on the Assessment of Navy Should-Cost Studies (OSD Case #3627). I am enclosing the reply.

Sincerely yours,

R. D. Nesen

ASSISTANT SECRETARY OF THE NAVY

Encl:
(1) Department of the Navy comments

ENCLOSURE I

Navy Reply

to

GAO Letter Report B-159896 of 15 May 1973

on

Assessment of Navy Should-Cost Studies

(OSD Case #3627)

I. GAO Findings and Recommendations

GAO assessed the Navy's use of should-cost studies to evaluate the efficiency and economy of contractors' operations. GAO states that two contractors were competing for production of the MK 48. This assessment was directed primarily to the study of the operations of the contractor which was awarded the first production contract in July 1971 for the Mark 48 torpedo. GAO inquired into: (1) the cost incurred to perform the studies; (2) the scope of the studies and the methods used to analyze the contractors' operations; (3) the types of improvements in contractor operations identified by the should-cost study team established for the MK 48 project and the actions taken to implement them; (4) the Navy's use of the study results in price negotiations; and (5) other benefits derived from the studies.

The Navy started a Cost Reduction Program in April 1970 which included Fair Price Analyses, Production Cost Studies, Product Engineering Reviews, and Performance Requirements Analyses. A private consultant made the production cost studies (in-depth analyses) of the two competing contractors' manufacturing processes and their ability to produce at a reasonable cost. These studies are the heart of the cost reduction program and were referred to as should-cost studies in congressional hearings and in Navy documents. GAO did not attempt to assess the Navy's entire cost reduction program but only the production cost studies. During the should-cost study, the consultant developed a computer cost model to accumulate and project cost information compiled by the study team. This model was used to compute should-cost estimates requested by the Navy and was delivered to the Navy as the final part of the report. According to the Navy, it plans to use the cost model for additional cost projections for the Mark 48 program and other weapon systems and for special studies.

GAO found that at the time of its review: (1) the contractor had taken steps to improve his operations in areas suggested by the should-cost consultant; (2) the Navy had not used the study team's analysis in negotiating the price for the first MK 48 production contract; (3) DCAA (Defense Contract Audit Agency) and DCAS (Defense Contract Administration

Service) analyses of the contractor's proposed price were used instead; (3) no evidence that the Navy project office had coordinated the separate analyses of the contractor's proposals performed by the consultant, DCAA and DCAS; and (4) the benefits which the Navy claims to have realized from the should-cost studies are largely intangible and cannot be measured precisely.

GAO recommends that the Secretary of the Navy insure that:

(1) should-cost studies are performed whenever possible by a team of Government personnel responsible for conducting the study and negotiating the contract price (in this way the team leader would be responsible for directing and coordinating study efforts and formulating a negotiation position based on the study's results); and

(2) Government representatives at the contractor's plant are fully informed of the improvements in contractor operations recommended by the study teams and the corrective actions which the contractor has agreed to take (these representatives should also be requested to monitor and report on the contractor's progress in implementing improvements).

In addition, GAO requests the Secretary of the Navy's views concerning the possibilities of using the should-cost approach more in its future procurements.

II. Navy Position

With regard to the first recommendation, the Navy does not fully agree that should-cost studies should be performed whenever possible by a team of Government personnel and that the team leader should be responsible for negotiating any ensuing contract. A should-cost study can be accomplished in any of the following ways: (1) by a team of Government personnel; (2) by contractor personnel; (3) by a consultant firm hired by the Government; (4) by a consultant firm hired by the contractor; and (5) any combination of the above.

The basic responsibility for efficiency rests with the contractor. Only if he is remiss in this regard should the Government assume this responsibility. It must also be recognized that the requisite level of talent may not always be available within Government or, as was the case with the MK 48 Torpedo program, there may be objectives other than the negotiation of contract price that must be considered. Also, if the findings of a should-cost team are properly documented, there is no particular benefit in having a should-cost team leader responsible for developing a negotiation position and negotiating the ensuing contract --this can be done by any competent contracting officer.

With regard to the second recommendation, the Navy agrees that all cognizant Government personnel should be made aware of should-cost team recommendations and that any recommended improvements be monitored to

ensure implementation. It is recognized that documented implementing procedures followed by regular reports and/or briefings to track progress were not established for the MK 48 should-cost as they were for the TF 30 jet engine. In the MK 48 should-cost study, the project manager initiated a series of meetings attended by the project manager, his deputy, the manager of the should-cost study, the contracting officer, company representatives and others at which monitoring was discussed. Several alternatives involving the DCAS/DCAA, other on-site technical representatives, special teams and consultants were considered. All aspects of the monitoring problem were fully developed including the impact on the contractor; adequacy of local resources; relationship to cost, schedule, performance reporting; monitoring costs; etc. The resulting plan reflected a moderate approach involving reliance on the cost, schedule, performance program; a brief special team follow-up; and general monitoring of the contractor's progress by project management personnel, local Government representatives, and a private consulting firm. The decision to monitor the MK 48 should-cost effort in this fashion was considered to be a proper exercise of project manager prerogatives with respect to managing a program.

The foregoing reflects past and current Navy policy with respect to should-cost studies and their use. The Navy currently intends to review this policy and will give full weight and consideration to the subject GAO recommendations, including greater use of the should-cost approach, in the course of its review.

ENCLOSURE II

DEPARTMENT OF THE NAVY
HEADQUARTERS NAVAL MATERIAL COMMAND
WASHINGTON, D. C. 20360

IN REPLY REFER TO
02/KLW
OCT 9 1973

CNM PROCUREMENT POLICY MEMORANDUM (PPM) NUMBER 11

To: Commander, Naval Air Systems Command
Commander, Naval Electronic Systems Command
Commander, Naval Facilities Engineering Command
Commander, Naval Ordnance Systems Command
Commander, Naval Ship Systems Command
Commander, Naval Supply Systems Command

Subj: Should Cost

1. This Procurement Policy Memorandum is intended to clarify the policy for application of Should Cost studies in weapon systems acquisitions within the Naval Material Command.

2. ASPR 3-807.2(c) defines cost analysis as "The review and evaluation of a contractor's cost or pricing data and of the judgmental factors applied in projecting from the data to the estimated costs, in order to form an opinion on the degree to which the contractor's proposed costs represent what performance of the contract should cost assuming reasonable efficiency and economy." This traditional approach to pricing remains the Navy's primary tool in the determination of the reasonableness of a contractor's price proposal during contract negotiations. The Navy relies on its contract negotiators on all major acquisitions to think in terms of what an item "should cost" rather than what it "will cost."

3. There are occasions, however, when normal cost/price analysis techniques prove to be insufficient. In these instances, analysis and projection of the cost data presented by a contractor does not provide sufficient assurance of the reasonableness of a contractor's proposed price. A formal Should Cost study may then become necessary. A formal Should Cost effort consists of an in depth study of a contractor's internal operations conducted by a team of experts. The Should Cost team analyses and questions areas generally considered managerial prerogatives such as the ratio of indirect labor to direct labor, organizational structure, and plant layout. In other words it is a complete study of the efficiency of a contractor's operations performed at the source. A Should Cost study can be

accomplished in any of the following ways: (1) by a team of Government personnel; (2) by contractor personnel; (3) by a consultant firm hired by the Government; (4) by a consultant firm hired by the contractor; and (5) any combination of the above.

4. It must be stressed that the efficiency of a contractor's operation is first and foremost the responsibility of the contractor himself. That fact, combined with the considerable expenditure of resouces involved, must weigh heavily in any decision for the Navy to conduct a Should Cost study. In general, the use of Should Cost studies is justified for major acquisitions only in sole source procurements or other situations where the forces of competition are not sufficient to induce the contractor to undertake reasonable efficiency and where it can be demonstrated that there is some doubt that he has done so.

5. The Should Cost method of pricing involves two objectives: (1) the possible short term application of price reductions to specific undefinitized contractual documents and (2) the long range objective of correction of all the inefficiencies found to exist in a contractor's plant. For maximum benefit, both to the contractor and to the Government, the primary result should be a long range, and hopefully permanent, improvement in the efficiency of his operation. Should Cost studies should not be viewed as confined to the support of the instant negotiation, nor need they encompass every aspect of a contractor's operation. Where significant doubt exists as to the reasonableness of individual cost elements such as the various overhead rates, "mini Should Cost studies" should be conducted. Information obtained in such studies would be most useful as a basis for negotiating improvements prior to future contracts.

6. Systems Commanders will coordinate proposals to engage in Should Cost studies with the DCNM(P&P). To this end a report of planned Should Cost studies will be submitted to DCNM(P&P) by 31 December 1973, and quarterly thereafter. Reports should include any "mini Should Cost studies" under consideration as well as complete Should Cost efforts.

ENCLOSURE II
02/KLW

Subj: Should Cost

7. This PPM is cancelled for record purposes on 30 April 1975.

K. L. Woodfin
Deputy Chief of Naval Material
(Procurement and Production)

Copy to:
MARCORPS (CSG-1)
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