Assessment Of Navy Should-Cost Studies B-159896

Department of the Navy

UNITED STATES
GENERAL ACCOUNTING OFFICE

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

PROCUREMENT AND SYSTEMS
ACQUISITION DIVISION

B-159896

The Honorable
The Secretary of Defense

Dear Mr. Secretary:

This report is on our assessment of the Navy's use of should-cost studies to evaluate the efficiency and economy of contractors' operations. The should-cost approach attempts to determine, on the basis of industrial engineering and financial management principles, the amount that weapons systems or products should cost, given attainable efficiency and economy of operations.

In October 1972 (B-159896) we reported the results to you of our assessment of the Army's should-cost studies. Our assessment of the Air Force's studies is nearing completion and will be reported on in the near future.

In 1967 the Navy made the first should-cost study which concerned the Navy's procurement of the TF-30 jet engine. The Navy has testified before several congressional committees that this study was useful in negotiating lower contract prices and in identifying long-range improvements in the contractor's operations to reduce future costs.

Since the TF-30 study, the Navy has made only two other should-cost studies. These concerned the operations of two contractors which were competing for production of the Mark 48 torpedo. Our assessment was directed primarily to the study of the operations of the contractor which was ultimately awarded the first production contract in July 1971.

In making our assessment we inquired into

--the cost incurred to perform the studies,

--the scope of the studies and the methods used to analyze the contractors' operations,

--the types of improvements in contractor operations identified by the should-cost study team and the actions taken to implement them,

--the Navy's use of the study results in price negotiations, and

--other benefits derived from the studies.

Our main objective was to identify opportunities for improving the Navy's use of should-cost concepts in the future.

MARK 48 PROGRAM HISTORY

The Mark 48 is a high-speed, long-range, deep-diving torpedo. The Navy awarded the first Mark 48 development contract in June 1964. This was a fixed-price-incentive contract with a target price of about $64 million. Subsequent modifications increased the target price to about $103 million.

In addition, the Navy awarded other contracts totaling $24 million for fire control system modifications and backup development of critical components. Subsequently, as the torpedo contractor experienced technical difficulties, the Navy in 1968 authorized one of the backup development contractors to expand its effort under an existing cost-plus-fixed-fee contract to provide for parallel development of a competing torpedo model. This increased the existing contract price by $26.7 million. According to Navy records, the total cost of development efforts on the Mark 48 torpedo by the two competing contractors was about $450 million. In 1970 the Navy awarded pilot production contracts totaling $78 million in order to maintain production capability of the two contractors until it decided which contractor should be selected for full-scale production.

Program cost estimates for the Mark 48 weapon system increased from $642 million in 1964 to $3.8 billion by December 1969. Navy reporting and analyses of program status showed that the cost increased because (1) the contractor underestimated the program's complexity, (2) the Navy did not initially plan a two-contractor competitive development program, and (3) revised program estimates were based on a lower production rate.

As of December 31, 1972, the program estimate had decreased to $1.5 billion. According to Navy records, the principal reasons for this decrease were (1) reductions in the number of torpedoes to be purchased, (2) accelerated procurement, (3) lower prices resulting from selecting another contractor's torpedo, and (4) the Navy's Cost Reduction Program.

actions to implement improvements. Further, the local DCAS office did not receive a copy of the study report until 5 months after the study was completed and then only after requesting a copy. Over a year after the study had been completed, the DCAA auditor in charge advised us that he had not seen the report.

We believe that local DCAA and DCAS representatives should be fully informed of the improvements needed in the contractor's operations and of agreements between the Navy and the contractor about implementing improvements. Also, if these representatives were assigned responsibility for monitoring and reporting to the Navy on the contractor's actions to implement the needed improvements, the Navy would have greater assurance that improvements are being implemented without conducting another study. This would also permit the local Government representatives to consider the impact of these improvements in evaluating the contractor's proposals for other procurements or for contract changes.

At the time of our review, we found that the contractor had taken steps to improve its operations in those areas suggested by the should-cost consultant. For example, an additional building had been added to improve plant layout and increase capacity; a factory work-order system was established to accumulate detailed costs; a standards group was formed along with the factory work-order system to improve the labor-control system; and changes were made in inspection and test procedures. Since these improvements are being implemented during the first production contract, we did not attempt nor would it be possible in most cases to quantify the impact these improvements will have on the cost of producing the Mark 48 torpedo. However, these improvements should provide management with information to control and reduce future production costs.

USING STUDY RESULTS IN PRICE NEGOTIATIONS

We found that the Navy had not used the study team's analyses in negotiating the price for the first Mark 48 production contract. DCAA and DCAS analyses of the contractor's proposed price were used instead. As stated in our report to the Congress (B-159896, Feb. 26, 1971), we believe the greatest benefits will accrue when procurement activities perform should-cost studies as part of their preaward analyses of contractors' proposals. At that time the results of the studies would be of maximum effectiveness in assisting Government negotiators in arriving at fair and reasonable prices, and the contractors would be more likely to accept should-cost findings and to promptly implement needed corrective actions.

As requested by the Navy, the contractor submitted proposed prices for fiscal years 1971 and 1972 production requirements as separate purchases and as a combined quantity. The should-cost consultant was asked to assess the contractor's proposed prices for separate purchases. At the same time the Navy asked DCAA and DCAS to evaluate the proposed prices for separate purchases and the combined quantity purchase.

The Navy elected to negotiate a contract price for a combined quantity. The negotiation records state that, in preparing the Navy's negotiation objective of $120 million, the negotiator relied primarily on DCAA and DCAS evaluations and recommendations and on technical comments from the Mark 48 torpedo project office. Also, the records state that should-cost assessments would be used during negotiations to the extent they support the overall Navy pricing objective.

In negotiations during May and June 1971, the winning contractor's proposed price of $130 million was reduced by $14 million to the contract award price of $116 million. We found that the Navy's negotiation records relate the negotiated reductions to DCAA, DCAS, and Navy evaluations without mentioning should-cost findings.

The study team assessed preliminary proposals prepared by the contractor for separate purchases of the 1971 and 1972 production quantities. Subsequently, these proposed prices were revised to recognize an engineering change directed by the Navy. DCAA and DCAS evaluated the contractor's revised prices for both the separate and combined purchase quantities. We found that the contractor's revised prices for separate quantities included direct labor costs of $18.3 million and overhead costs of $24.1 million which did not differ significantly from the same costs included in the preliminary proposed prices assessed by the study team. As a result of its analysis, the study team estimated that direct labor and overhead costs could be reduced by 19 percent and 23 percent, respectively, whereas DCAA and DCAS questioned less than 1 percent of direct labor costs and 7 percent of overhead costs.

The assessment reports and supporting workpapers which the consultant made available to us showed that several industrial engineering and management analysis techniques were used to assess the contractor's proposed labor hours and overhead costs. For example, the assessment of direct labor included an examination of drawings, operations sheets, inspection specifications, and prints of tools and fixtures for selected high-cost parts. Also, the factors added to labor standards and learning improvement rates were evaluated on

the basis of past experience and industry norms. Major support functions were analyzed considering proposed manpower in relation to required tasks. DCAS recommended direct labor reductions by using the contractor's historical experience for another model torpedo and by comparing the proposed hours with those proposed for an earlier pilot production of Mark 48 torpedoes.

The study team's recommended reductions in overhead were based on an analysis of all overhead categories by department and the direct labor base. DCAA-recommended reductions were based on questioning projected expenses that had been inadvertently overstated by the contractor and other projected expenses which were proposed at a rate higher than that actually being experienced.

Since the study team assessed prices for separate purchases and the Navy negotiated a price for a combined quantity, we could not determine what impact using should-cost results in negotiations would have had on the contract price. However, we did note that the Navy's negotiation position and the negotiated costs for direct labor and overhead for a combined quantity were substantially higher than the should-cost estimates for separate quantities. For example, the study team's estimate for overhead was about $5 million less than the Navy's negotiation position and the amount negotiated.

The Navy negotiator informed us that, after reviewing the assessment reports and visiting the consultant, he concluded that the assessment results could not be used for the following reasons:

--Much of the information was too general.

--Some of the team's methods and conclusions were questionable.

--Implementing the team's recommendations would take considerable time.

--The contractor was better informed about the study findings than the Navy.

--There was no early coordination between the study team and the negotiator.

We found no evidence that the Navy project office had coordinated the separate analyses of the contractor's proposals performed by the consultant, DCAA, and DCAS. According to

DCAS and DCAA representatives, they had little knowledge about the consultant's work and had not been requested to assist or support him in his study. Further, the consultant stated that his review was deeper than the Government's and his objectives and approach differed from that of DCAA and DCAS.

We believe that the Navy project office, which commissioned the study, should have coordinated the two evaluation efforts and insured that the negotiator was provided the necessary information on a timely basis to prepare a negotiation position which considered the findings of each evaluation.

Although the should-cost assessments were not used in negotiating the contract price for the first production buy, the Navy has advised us that information in the final should-cost report received on June 1, 1971, will be used in negotiating the price for the second production buy. Information available to us at the time we completed our review indicated that should-cost projections were being considered in preparing for the negotiations.

In applying the should-cost approach, the other military services and the Navy in the TF-30 study found that forming a Government team responsible for the study and for negotiating the contract price proved valuable in strengthening the Government's bargaining position. In this way the team approach could be carried through the negotiations, and the collective knowledge and expertise of the team could be applied to obtain a reasonable price. However, the Navy negotiator for the Mark 48 procurement was not a member of the study team nor did the team participate in negotiations. Also, we noted that the winning contractor was opposed to a private consultant making a should-cost study of its operations and agreed reluctantly to give the consultant access to its records and operations.

We believe that, in future studies, the Navy should form a team of Government personnel responsible for conducting the study and negotiating the contract price. This approach will not only strengthen the Government's bargaining position in negotiations but will establish a cadre of experienced personnel for future studies.

MARK 48 PROJECT OFFICE COMMENTS

Navy officials agreed that the greatest benefits will accrue when should-cost studies are performed as part of the preaward analysis of contractors' proposals. They pointed out

that this conventional approach is appropriate when the study is directed to evaluating a proposal submitted by a sole-source producer which will be the subject of a forthcoming negotiation. Under these circumstances, it would be appropriate for a team of Government personnel to perform the study as was done in the TF-30 jet engine study.

Navy officials stated that the Mark 48 torpedo should-cost studies were not intended to be used as the basis for negotiations with the contractors but were to provide comparable should-cost estimates for the two competing contractors. This would assist the Navy in selecting one contractor for full-scale production and would identify areas where the contractors could improve their operations to reduce the cost of producing the torpedo.

Navy officials believe the studies were cost effective and fulfilled their purpose by aiding the Navy in selecting the winning contractor and identifying areas where the contractor needed to improve its operations.

Navy officials cited several reasons why the should-cost studies of the two contractors competing for production of the Mark 48 torpedo were not used in the same manner as in the traditional should-cost approach to a sole-source procurement.

Although the should-cost study was not intended to be the basis for negotiations, the contracting officer stated that he directed the negotiator to meet with the should-cost consultant to determine whether the consultant had information which could be used in negotiations. The contracting officer stated that the should-cost data was not in a usable form for negotiations.

He stated, however, that the consultant's should-cost estimates for each cost element in the contractor's proposal was compared with the DCAA and DCAS positions for those elements. Where the should-cost estimates differed substantially from the DCAA and DCAS positions, the contracting officer and negotiator reexamined the positions for those elements. The contracting officer stated that, because of a compressed time frame for negotiations and the fact that negotiations were being conducted concurrently with the two competing contractors there was not sufficient time to reexamine the should-cost positions.

We believe that coordination of the evaluations by the consultant and Government teams and earlier involvement of the negotiator in evaluation efforts would have insured that major differences between the two teams were resolved in sufficient time to be of value during negotiations.

The benefits which the Navy claims to have realized from the should-cost studies are largely intangible and cannot be measured precisely. We are therefore not in a position to determine whether the benefits were commensurate with the costs incurred for the studies. We have reservations, however, about the prudence of the Navy's decision to invest over $1 million in the studies without taking the steps necessary to insure that the results would be used in price negotiations.

RECOMMENDATIONS

In planning and conducting future should-cost studies within the Navy, we recommend that the Secretary of the Navy insure that:

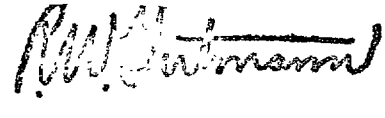
--Should-cost studies are performed whenever possible by a team of Government personnel responsible for conducting the study and negotiating the contract price. In this way the team leader would be responsible for directing and coordinating study efforts and formulating a negotiation position based on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

--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.

The Army and the Air Force have made a number of should-cost studies and have claimed substantial benefits in reducing contract prices in negotiation and identifying improvements needed in contractors' operations. Because of the Navy's limited use of the should-cost approach, we are requesting the Secretary of the Navy's views concerning the possibility of using this approach more in its future procurements.

Copies of this report are being sent today to the Director, Office of Management and Budget; the Secretary of the Navy; and interested congressional committees.

Sincerely yours,



Director