

GAO

United States General Accounting Office 130772
Report to Congressional Requesters

August 25, 1986

DOD ACQUISITION

Case Study of the Navy DDG-51 Guided Missile Destroyer Program



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Preface

The Chairmen of the Senate Committee on Governmental Affairs and its Subcommittee on Oversight of Government Management asked GAO to examine the capabilities of the program manager and contracting officer in weapon systems acquisition. As part of this study, GAO examined 17 new major weapon system programs in their initial stages of development. These case studies document the history of the programs and are being made available for informational purposes.

This study of the Navy's DDG-51 Guided Missile Destroyer Program focuses on the role of the program manager and contracting officer in developing the acquisition strategy. Conclusions and recommendations can be found in our overall report, DOD Acquisition: Strengthening Capabilities of Key Personnel in Systems Acquisition (GAO/NSIAD-86-45, May 12, 1986).

for 
Frank C. Conahan, Director
National Security and
International Affairs Division

DDG-51 Guided Missile Destroyer

Origin of Program

In May 1978, the Chief of Naval Operations formed a Navy study group to set requirements for the next generation of surface warships. Until June 1979, they examined the threat facing the Navy into the 1990s and beyond, assessed the combat capabilities required to meet that threat, and evaluated various ship concepts to see which could do the job within certain size and cost limits.

In August 1979, the Chief of Naval Operations directed the Chief of Navy Materiel to further study other ways to meet selected operational requirements. The design was required to (1) enable a lead ship to be authorized by either the fiscal year 1984 or 1985 shipbuilding programs, (2) follow proven war ship design technology, and (3) satisfy top level Navy mission requirements.

Formation of Program Office

In October 1979, the DDGX program office (later called the DDG-51) was established in the Naval Sea Systems Command and a military program manager was appointed. With 9 years of deputy and program manager acquisition experience, he had worked on the earlier development stages of the ship's design. His formal education included degrees in engineering and nuclear physics. The program manager's role was to ensure the adequacy of the planning, direction, control, and utilization of program resources and support. A contracting officer, a Navy commander, was also assigned to the program in 1979.

Evolution of the Acquisition Strategy

Between 1979 and late 1982, the Navy did concept and preliminary design work to determine how the DDG should be configured and equipped to fulfill its offensive and defensive missions. These studies prompted a February 1980 Chief of Naval Operations Executive Board decision memorandum. Besides encouraging competitive industrial involvement in design development and construction, the memorandum ordered a plan of action with milestones after analysis of whether the Navy (1) could buy the recommended designs for less than \$500 million (fiscal year 1980 dollars) and (2) should award the lead ship contract in the 1980s.

The Naval Sea Systems Command did the concept design work in-house, using private designers during concept exploration. The Navy and industry did over 30 trade-off studies to select major systems, integrate concepts, and explore how much they could use standardized systems engineering. This work provided higher commands with two alternative final designs for costing combat systems and ship construction. In 1980,

the Chief of Naval Operations announced draft missions and requirements for the DDGX program.

In its initial May 1980 industry briefing, the Navy discussed the program and gave contractors an early opportunity to plan their participation in the destroyer program.

In February 1981 the program office issued an acquisition strategy. The Navy Decision Concept Paper, dated August 1981, supported the need for the new destroyer program as described in the acquisition strategy. The initial strategy had industry involved early in design, with design agents and shipbuilders doing competitive design and producibility studies. Specifically, the program strategy stated that in January 1983, a competitively placed contract would be awarded to a prospective lead shipbuilder and two prospective alternate lead shipbuilders to help the Navy complete the design. It also stated that in January 1984, the Navy planned to award a sole source negotiated contract to the prospective lead shipbuilder to begin lead ship detail design and procure long-lead material to design and build it. To avoid the construction misfortunes and contract difficulties of prior lead ship construction projects, the program manager's strategy called for continuous industry involvement, with at least two shipbuilders working on the ship's final design.

In March 1981, the Chief of Naval Materiel appointed a special independent panel to review the two baseline configurations. The panel concluded that the Navy still needed the new destroyer program but recommended combat and propulsion system changes. According to subsequent program office design studies incorporating these recommendations, a ship design of 8,700 long tons with a gas turbine propulsion system would cost between \$600 million and \$650 million in fiscal year 1980 dollars.

The Department of the Navy Acquisition Review Council reviewed the new destroyer program in June 1981. However, the Defense Systems Acquisition Review Council review at milestone I was waived by the Secretary of Defense in September 1981, and the program proceeded through the demonstration and validation phase.

It became apparent that the Chief of Naval Operations' goal of an 8,500-ton ship and the panel recommended 8,700-ton ship could not meet the design conservation, range, and speed requirements. The Naval Sea Systems Command program office then developed two configurations: one 8,500-ton unit under reduced requirements and one 9,100-ton unit.

These alternatives were presented to the Assistant Secretary of the Navy (Shipbuilding and Logistics), the Chief of Naval Materiel, and a representative of the Chief of Naval Operations in December 1981. After their meeting, the Naval Sea Systems Command recommended that a gas turbine configuration of about 8,500 tons be designed. In late 1981, a Navy Decision Concept Paper was approved and cited the ship's baseline requirements. In December 1981 the new destroyer program was redesignated the DDG-51 program. In February 1982, the Chief of Naval Operations concurred with the 8,500-ton gas turbine design configuration and the Naval Sea Systems Command started preliminary design work.

**Second Contracting Officer
Appointed**

In November 1981, a new contracting officer was assigned to the program. He had 7 years of contract administration experience and entered the field through a Navy procurement intern development program. His formal training included an undergraduate degree in economics with business-related courses.

**Competition for the Concept
Definition**

In February 1981, the Gibbs and Cox Design Agency was competitively awarded a systems engineering contract to support the Naval Sea Systems Command in the destroyer's design. In May 1981, seven shipbuilders won contracts to help the Naval Sea Systems Command do design trade-off studies. All the shipbuilders received results of these studies.

According to discussions with Naval officials, the program manager and contracting officer worked jointly to prepare a competitive acquisition strategy that incorporated lessons learned from previous shipbuilding programs and comments from the July 1978 Naval Ship Procurement Process Study and Navy Research Advisory Council. The program manager noted that he was mainly responsible for developing the strategy.

The program office briefed industry throughout the DDG-51's development. Briefings were held during contractor bidder conferences, before awarding level of effort trade-off studies, and before requests for proposals on final design and lead ship construction. Both the program manager and contracting officer were involved in the source selection process. They were jointly responsible for (1) developing the source selection plan, (2) ensuring that the statement of work and business terms and conditions did not restrict competition, and (3) ensuring that the request for proposals and acquisition strategy were consistent. The

program manager had primary responsibility for (1) ensuring that the request for proposal evaluation criteria did not restrict competition and (2) evaluating contractor technical and cost proposals. The contracting officer had primary responsibility for (1) setting the competitive range, (2) developing the request for proposal, and (3) evaluating the contractor proposals. In developing the source selection plan, both worked with program and technical advisors. They both said plan development entailed a coordinated effort among the program, technical, contracting, and legal personnel.

**Acquisition Strategy
Changes Directed by Higher
Commands**

Preliminary design work began in February 1982 with increased attention being placed on developing the preliminary design and baseline, and integrating various systems into the total ship system.

In August 1982, the Naval Sea Systems Command issued a request for design proposals from interested shipbuilders. A contractors' bidder conference was held shortly thereafter. In October, the Naval Sea Systems Command began source selection. By February 1983, the contractors' best and final offers were competitively evaluated, whereupon three contractors were to be awarded design contracts. One builder was to be designated the prospective design/lead ship builder, with two builders being alternate or prospective lead/follow builder.

But, in March 1983, at the direction of the Secretary of the Navy, the Commander, Naval Sea Systems Command, cancelled this strategy. Rather than work principally through one prospective lead shipbuilder, the Commander directed contract design work to be done by the Navy with industry assistance. According to the Secretary, the cancelled strategy did not sufficiently emphasize design and construction costs and did not ensure that the lead shipbuilder would be selected on the basis of definite, reliable ship construction cost considerations. To meet unit cost goals of \$1.1 billion for the lead ship and \$700 million for follow-on ships (1983 dollars), the Secretary ordered structural and systems design changes.

In May 1983, the Navy began contract design work in-house with a co-located Navy/industry team. This team was composed of Naval Sea Systems Command personnel, naval architecture/marine engineering firms, the combat systems engineering agent, and naval laboratories. The Navy also established a resource control team and a review board to monitor and maintain schedule and cost goals.

The first program manager was reassigned in August 1983 by the Naval Sea Systems Command to another major program; his replacement reported 13 days before his departure. The replacement had no prior program management experience or training. His formal education included a bachelor's degree in naval science, a master's degree in management, and nuclear power training, with 23 years of operational and other Navy training experience including 5 years command at sea.

The milestone II review was held in December 1983. In January 1984, the Secretary of Defense authorized full-scale development.

The second program manager, in accordance with the Secretary of the Navy's 1983 program direction, began in early 1984 to develop a new competitive strategy for lead ship detailed design and construction. He was assisted mainly by the program office staff, the assigned contracting officer, legal counsel and technical functional groups. He and the contracting officer jointly developed the source selection plan. The plan was then approved by the Source Selection Advisory Council and Source Selection Authority. The Secretary of the Navy concurred.

According to the program manager, the development of the new request for proposals and the statement of work was a joint effort. Specifications were developed by an engineering design team with input and approval from the program office. Business terms and conditions were developed in the program office on a joint basis, with the contracting officer playing a primary role and the program manager assisting. Evaluation criteria were developed by the program manager, business manager, contracting officer and legal counsel; all proposal evaluation plans were subject to final approval by the Source Selection Advisory Council and Source Selection Authority.

The Commander, Naval Sea Systems Command, took further measures in early 1984 to ensure the DDG-51's affordability by modifying the acquisition strategy. Thinking that the contractor should share more of the design and construction risks on the DDG-51 lead ship, Navy officials substituted a fixed-price type contract for the original cost type contract. Although the program manager and contracting officer believed that the lead ship construction risks warranted a cost type contract, they could not convince the Commander and agreed to use fixed-price contract terms.

Before finishing the contract design, the Navy issued a draft request for proposal to industry for comment. The second program manager stated

that industry comments on the draft proposal were of a clarification nature. The formal requests for proposals on ship design and construction were issued to industry contractors in August 1984 with qualifying proposals due November 29, 1984. At the request of one of the offerors the closing date was extended to December 20, 1984.

In late August 1984, the contracting officer was promoted and left the program. His replacement held the position for 2 months before he resigned from the government. A new contracting officer was assigned in October 1984.

The program manager's and contracting officer's roles during the contractor proposal evaluation process varied. The program manager chaired the Source Selection Evaluation Board, which included 11 senior Naval Sea Systems Command program management and contract executives. The contracting officer helped the board evaluate the technical and cost components of contractor proposals. He stated his role was administrative, and involved assessing whether the evaluations followed the source selection plan. He also evaluated contractor cost proposals for reasonableness.

The contracting officer stated that no contractor negotiations were held during the DDG-51 evaluation process since the Board saw no need and the Source Selection Authority concurred.

Both the program manager and contracting officer agreed that in the selection and award process the latter is mainly responsible for notifying award recipients. All participating contractors were notified by telephone and in writing. According to the contracting officer, they were also debriefed on their proposals' strong and weak points within 10 days after the contract was awarded. He headed the debriefings between the Navy and the contractors, while the program manager conducted the technical discussions.

Industry Views

Three industry experts on ship construction who we contacted believed the fixed-price type contract was chosen because the shipyards were operating at less than full capacity and would agree to such terms even if it was not in their best interest. These industry experts expressed the view that use of a fixed-price contract was inappropriate for lead ship design and construction because there are too many technical and cost uncertainties.

Evaluation of Acquisition Strategies

The original DDG-51 strategy provided for a prime contract award early in the design stage. That strategy was rejected in favor of a strategy which deferred the contract award for lead ship design and construction until late in the process. According to an Office of the Secretary of Defense official, no specific guidance exists on how and when to conduct a design competition or how long to continue it.

Tentative Navy follow-on ship construction plans as of late 1985 provided for competition between up to three builders for three ships a year from 1987 and several ships thru 1991 to 1992. To keep shipbuilders competitive with the lead ship contractor, the Navy arranged for prospective shipbuilder accommodations at the lead ship contractor's facilities. This will allow builder representatives to stay current on design and development progress. Further, ship technical data rights will remain with the Navy, with data transfer from the lead shipbuilder to the follow-on builder being provided for in a later negotiated service contract.

Present Status

The DDG-51 lead ship design and construction contract was awarded by the Navy in early April 1985 to Bath Iron Works for a fixed-price bid of nearly \$322 million and a planned delivery date of late 1989. Bath's was the lowest of three bids— 7 percent lower than its nearest competitor and 28 percent lower than the other. The milestone III production decision is expected in late 1986, with contract award during fiscal year 1987.

Chronology of Events

May 1978	Concept exploration begun.
October 1979	DDGX project office established. Program manager appointed.
November 1979	Contracting officer assigned.
February 1980	Milestone 0 decision.
May 1980	Industry briefing on ship, combat system, and acquisition strategy.
February 1981	Acquisition strategy issued.
June 1981	Department of the Navy Acquisition Review Council reviewed and approved acquisition strategy.
September 1981	Defense Systems Acquisition Review Council milestone I review waived.
November 1981	Second contracting officer assigned.
December 1981	Navy Decision Concept Paper approved. DDGX redesignated DDG-51.
February 1982	Preliminary design started.

Chronology of Events

August 1982	Request for proposals issued for design contract and lead ship construction option.
October 1982	Proposals received and evaluated. Preliminary design phase completed.
February 1983	Contractor best and final offers received. Design changes and cost ceiling directed by Secretary of the Navy.
March 1983	Commander, Naval Sea Systems Command, canceled competitive source selection process for design contract.
May 1983	In-house contract design work began.
August 1983	Second program manager assigned.
January 1984	Full-scale development authorized.
June 1984	Contract design completed.
August 1984	Request for proposal for detailed design/lead ship construction issued. Third contracting officer assigned
October 1984	Fourth contracting officer assigned.

Chronology of Events

November 1984

Request for proposals closing date.

April 1985

Detailed design and lead ship contract award to Bath Iron Works for \$322 million.

September 1985

Third program manager assigned.

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Washington, D.C. 20548

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