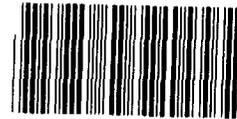


August 25, 1986

DOD ACQUISITION

Case Study of the Army Sense and Destroy Armor Projectile Program



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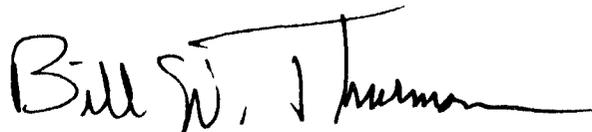
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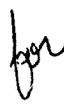
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Preface

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 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 8-inch Sense and Destroy Armor Projectile 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.)



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Sense and Destroy Armor Projectile

Origin of Start

According to an Army requirements document, the need for the 8-inch Sense and Destroy Armor (SADARM) projectile grew out of the perceived Warsaw Pact armored vehicle threat. The SADARM system would use an existing M509 8-inch projectile to carry multiple submunitions and to disperse them over a desired target area. The submunitions would have a fire and forget capability being capable of detecting and firing on an enemy target after being dispersed from the projectile. The Army's Research and Development Center, Dover, New Jersey, was responsible for developing the new weapon system.

Although the concept of a submunition for detecting and firing at targets existed in the early 1960's, the necessary technology had not advanced far enough to demonstrate the SADARM's feasibility. To advance this technology the Army awarded contracts for submunition components. Successful demonstration of these components in the late 1970's made the SADARM concept feasible.

Preprogram Strategy

The Center solicited industry interest in October 1977 to develop a submunition for demonstration purposes. The Center issued thirty-one request for quotations to contractors and six—Honeywell, Aerojet Electro Systems, Martin Marietta, Cutler-Hammer, Hughes and Singer—responded. On May 10, 1978, the Army awarded a single contract to Aerojet for \$820,000. According to an engineer in the Center's Large Caliber Weapon System Laboratory, funds were available for only one contract. Honeywell submitted an unsolicited proposal on February 16, 1979, in which it proposed to demonstrate the submunition for \$100,000. The Army negotiated this proposal and placed a contract with Honeywell. The Laboratory engineer believes this contract instilled more competitiveness in the program at a minimal cost to the Army. In 1979, both contractors conducted a successful submunition demonstration.

Formulation of 8-Inch Program Acquisition Strategy

In January 1980, the Center forwarded a Justification for Authority to Negotiate a Class of Contracts to the Assistant Secretary of the Army (Research, Development and Acquisition), for approval. In addition to providing a justification for negotiating contracts for SADARM's advanced development, it outlined the acquisition strategy to be used calling for

- conducting negotiations with only qualified firms,
- procuring parallel design approaches leading to a single design in engineering development, and
- using cost-plus-incentive-fee contracts.

The Assistant Secretary, on February 8, 1980, approved the use of negotiated contracts and the strategy to acquire the 8-inch SADARM.

Development of an Acquisition Plan

The acquisition strategy for the 8-inch SADARM program is formally recorded in a procurement plan. This plan completed by March 31, 1980, continued the use of only qualified firms and cost-plus-incentive-fee contracts. It expanded on the parallel design approach leading to a single design by specifying that competition between two contractors would occur in advanced development and that the winner of a competitive demonstration firing would likely be selected for engineering development. It also provided for termination of a contractor failing to meet minimum performance standards during advanced development.

Program Manager and Contracting Officer Designated

A lieutenant colonel was assigned as the first 8-inch SADARM program manager in February or March 1980. The procurement plan identified the lieutenant colonel as the development project officer and as a participant in the plan's development.

In March 1980 a contracting officer was designated. The officer had about 20 years experience in procurement and had received a certificate of appointment to a contracting officer position in 1980. In commenting on his certificate he said it provides signature authority but little program management perogatives. He said the Procurement Directorate can easily circumvent his refusal to sign a contractual document by obtaining the signature of another contracting officer. His successor concurred with this view. The contracting officer said he was not involved in formulating the acquisition strategy since it was done prior to his assignment.

According to the contracting officer, his primary role in acquiring the SADARM was to

- assure contract documents were in compliance with procurement laws, regulations and Center policies,
- reformat the statement of work, specifications, and evaluation criteria prepared by the Laboratory staff as necessary, and insert these into the request for proposal, and
- administer contracts to assure compliance with contractual provisions and to process contract amendments.

Source Selection and Contract Award for Advanced Development

The contracting officer's assistant assembled a request for proposal which was reviewed by the contracting officer for accuracy. The request for proposal was sent in April 1980 to 17 contractors. Four contractors (Aerojet Electro Systems; Honeywell, Inc.; AVCO Systems Division; and Singer Aerospace Marine Systems, Kearfott Division) submitted proposals.

The contracting officer said he assembled a team, comprised of members the Laboratory staff recommended, to evaluate the proposals. This evaluation team recommended Singer be dropped from consideration. The team ranked the three other contractors' proposals.

The contracting officer's assistant said he conducted the contract negotiations after establishing negotiation ranges and objectives using information the team provided. The assistant was supported by a team comprised of technical, cost, legal and program management specialists. A final review of best and final offers led to this team recommending, on September 17, 1980, that contracts be awarded to Aerojet Electro Systems and Honeywell. The contracting officer accepted this recommendation and awarded contracts to Aerojet and Honeywell on September 25, 1980. The estimated costs of these contracts were \$14 million and \$10 million, respectively. This advanced development program was to continue from 38 to 42 months.

Industry Views

Singer and AVCO were not selected to develop the 8-inch SADARM. Singer was excluded from further consideration because the Center's evaluation team believed Singer's proposed "rigid rotor" concept was not supported by sufficient design data. An Army debriefing memorandum indicated that Singer agreed with the Army's assessment. In a letter responding to our questions on the Army's contracting, a Singer official stated.

"The procurement plan recognized the advantages of a competitive environment during the development phases of the program by stating the intent to issue two parallel development contracts and indeed subsequently implementing that intent"

"Whether an item or area of risk is unacceptably high is a judgement that the evaluation team has to make. We do not believe that this judgement was made with malice or based on any bias but was an honest judgement based on the material available"

AVCO lost because the evaluation team rated its proposal lower than competing contractors' proposals. An AVCO official said in responding to our questions that:

- The SADARM procurement process was conducted in an orderly fashion and AVCO was given adequate opportunities to present a proposal.
- The request for proposal terms and conditions were clear as were the evaluation criteria.

Designation of the Second Program Manager

A civilian (GS-14) became the new SADARM program manager in October 1980. The second manager has an electrical engineering degree and completed some graduate work in systems acquisition and computer programming. The Center's commanding general issued a charter in March 1981 authorizing the program manager to

- report to the commanding general through the director of his directorate,
- develop and maintain plans to assure timely development, acquisition, and fielding of the assigned projects,
- approve budget programming and reprogramming actions, elevate program change requests to higher authority, and direct the distribution of program funds to participating organizations; and
- review and recommend approval/disapproval of material release and requirement documents.

The program manager believes the authority embodied in his charter exists in practice. He specifically said that control over funding distribution enhanced his authority to manage the program. However, he noted his authority could be limited because his charter states that a division chief is also the program manager's immediate supervisor.

The program manager said he was assigned after contracts had been awarded. He said program execution required him to coordinate extensively with the Laboratory and Procurement Directorates.

Development of a Revised Acquisition Strategy

On January 11, 1982, the Acting Deputy Assistant Secretary of the Army (Acquisition) issued Acquisition Letter 82-2 revising the Army Defense Acquisition Regulation Supplement. The Letter required the head of a contracting activity to assure that opportunities for competition are not lost or foreclosed by restrictive need statements, either vague or overly detailed specifications, inadequate procurement planning or by any arbitrary action. Further, appointment of a Special Advocate for Competition was required.

A Center draft plan, dated May 4, 1984, for increasing competition stated that the commanding general at the Center was appointed as an Associate Advocate for Competition. In regards to the SADARM program, the Center commanding general wrote a letter to higher headquarters on April 8, 1982, requesting review and concurrence of a revised strategy. Whether the commander was acting in the role of a competition advocate was not clear. It is clear, however, that he was advocating more competition in the program. The program manager said he drafted the letter sent by the commanding general using ideas provided by his immediate supervisor (division chief), who was in charge of formulating a new strategy, and Laboratory staff. The program manager also said that during the revised strategy's formulation his primary role was to act as a coordinator or focal point recording ideas from various sources (primarily Laboratory staff) consolidating these ideas, preparing documentation as required and tracking the revisions through the review process. Laboratory officials said they and the division chief formulated the revised strategy embodying more competition throughout the program to avoid production cost problems such as those experienced in the Copperhead program and to reflect the emphasis placed by DOD, the Army and the Center on competition.

Designation of the Second Contracting Officer

The contracting officer's assistant said he succeeded the first contracting officer on February 11, 1982, when he received a Certificate of Appointment. The new contracting officer (GS-13) majored in business administration; his course work included statistics, economics, and management courses. This contracting officer was appointed after contracts had been awarded for the SARDAM's development. The contracting officer said he acted as an advisor to the program manager while the acquisition strategy was being revised.

Approval of the Revised Acquisition Strategy

The revised strategy extended the dual contractor competition into production. The commanding general's April 1982 letter provided the rationale for the strategy revisions. The rationale was the

- risk associated with choosing one contractor for engineering development based on advanced development designs which could contain components not proven reliable,
- unavailability of sufficient data during early advanced development to determine the SADARM's actual cost and producibility, and
- potential loss of a 20 percent production savings if there was a sole source award.

On July 30, 1982, Army headquarters notified the Center that proposed revisions to the strategy were approved on the condition that

- the two current contractors (Honeywell, Inc. and Aerojet Electro Systems) continue into engineering development, and
- if only one design is successful a leader-follower approach be implemented where the nonselected contractor would fabricate a learning quantity of the superior design and compete for production, whereas, if both designs were successful both would be type classified and enter production.

The acquisition plan was revised and the program manager signed this plan. The program manager said he verified that it incorporated the proposed strategy revisions and conditions before he approved the plan.

In March and April 1983, the contractors provided the estimated costs to complete advanced development under the revised acquisition strategy. The contracting officer said he delegated the responsibility for modifying and renegotiating the contracts to his assistant. Once drafted, the contracting officer said he reviewed the contract amendments for accuracy. An Acquisition Strategy Review Panel, established by the Center Technical Director, reviewed the revised strategy. The program manager presented the strategy to the Panel and, according to the program manager, it was approved as presented.

The negotiations culminated in an increase to both Aerojet's and Honeywell's contracts of about \$14 million each. Of these amounts, about \$4.9 million and \$9.4 million were attributed to the revised acquisition strategy for Aerojet and Honeywell, respectively. The remaining increases were attributed to contract cost overruns bringing the total estimated cost of completion in September 1983 to \$29.9 million for Aerojet and to \$25 million for Honeywell.

Program Changes and Funding Cuts

During 1983 the Army decided to terminate the 8-inch SADARM program. The Deputy for Industrial Resources, Office of the Secretary of the Army, and the Department of Army systems coordinator for SADARM said a study on the Army's force structure concluded that 8-inch howitzers should be replaced with 155-mm. howitzers and Multiple Launch Rocket Systems. Consequently, they said the requirement for an 8-inch SADARM no longer existed.

As a result, the Congress limited funding for the SADARM to only a 155-mm. version. According to Center officials, the denial of further funding jeopardized an orderly termination of the 8-inch SADARM advanced development phase. They said some funding was obtained in July 1984 which was added to existing funds so that the contractors could complete a revised scope of work and provide maximum data and a demonstration test even though advanced development could not be completed.

Aerojet and Honeywell continued their efforts to develop and demonstrate the 8-inch SADARM. The contracting officer believes that sometime in November or December 1984 both contractors exhausted the government funds available. Aerojet's contract progress report dated January 21, 1985, states that attempts to fire a complete projectile with two live submunitions on December 14, 1984, were unsuccessful. An Army firing report states that on April 10, 1985, two complete SADARM projectiles were fired by Honeywell each hitting a target.

Evaluation of Roles and Acquisition Strategy

The second program manager acted only as a coordinator or focal point in revising the acquisition strategy. He stated that his immediate supervisor was in charge of the acquisition strategy formulation process.

DOD policy defines the contracting officer's role as one of supporting the program manager by preparing and maintaining the acquisition plan; it also provides a highly visible role for the contracting officer in executing the acquisition strategy. The first contracting officer was not assigned to the program until after the initial acquisition strategy had been formulated. In developing the request for proposal, he reviewed what his contracting assistant assembled. The second contracting officer said he acted as an advisor during the acquisition strategy's revision.

Acquisition Strategy

The preprogram strategy called for paper competition and led to a single contract award. An unsolicited proposal, led to award of a second contract making this phase competitive. The initial program strategy called for discontinuing competition during advanced development. However, this strategy was modified by extending the existing contracts and planning for two competing contractors in engineering development and production. Both program strategies (but not the early preprogram strategy) satisfied DOD policy which calls for competition up to full-scale development, further if cost effective

External Influences

Influences external to the 8-inch SADARM program affected the Army's approach to procuring the new weapon system and eventually led to its termination. Center officials said they formulated a revised strategy embodying more competition throughout the program to avoid production cost problems such as those encountered on another Army program (Copperhead) and because of the emphasis being placed by DOD, the Army, and the Center on competition. Army officials said the reason for terminating the program was an Army study which concluded that the 8-inch howitzers should be replaced with other weapon systems. The program's termination obviated the need for the revised strategy.

Present Status

In October 1985 the contracting officer said he was awaiting certification from Laboratory officials on what contract deliverables were received on the 8-inch SADARM program. This information, he said, was required before the program's financial close-out can begin.

The Army is planning for the engineering development of a new SADARM program, according to the Center officials. This program's objective, as directed by Army Materiel Command headquarters, is to develop SADARM submunitions for use in the Multiple Launch Rocket System and a 155-mm. howitzer projectile. After almost 1 year (November 1984 - September 1985) and six strategy iterations final approval for a strategy had not been obtained. On September 20, 1985, according to Center officials, a headquarters command official directed major changes to a strategy presented on that date. One change affects the competition in the program by directing that the two contractors selected for engineering development complete all development and produce the total planned procurement quantities. Entry into engineering development was scheduled for July 1986.

Chronology of Events

1960's	Submunition artillery projectiles developed.
1970's	Technology contracts awarded; SADARM components developed.
October 1977	Industry solicited for development of a SADARM submunition.
May 1978	Single contract awarded to Aerojet.
February 1979	Unsolicited proposal submitted by Honeywell.
May 1979	Aerojet successfully demonstrated SADARM submunition.
August 1979	Honeywell successfully demonstrated SADARM submunition.
January 1980	Authority to contract for advanced development requested; an initial acquisition strategy outlined.
February 1980	Assistant Secretary of the Army approved a request to develop the 8-inch SADARM and the initial acquisition strategy.
March 1980	First program manager and contracting officer designated.
April 1980	Request for proposals issued to 17 contractors.
September 1980	Army Research and Development Center evaluation team recommended award of contracts to Aerojet and Honeywell. Contracts awarded to Aerojet and Honeywell.

Chronology of Events

October 1980	Second program manager designated.
February 1982	Second contracting officer appointed.
April 1982	The Center's commanding general signed a letter proposing revisions to the acquisition strategy.
July 1982	Proposed revisions to acquisition strategy approved by Army headquarters.
March 1983	The Center's Technical Director established an Acquisition Strategy Review Panel.
September 1983	Advanced development contracts modified to incorporate revisions.
December 1983	Funding for 8-inch SADARM eliminated; 155-mm. version funded instead.
July 1984	Additional funds provided for orderly termination of the 8-inch SADARM's advanced development.
December 1984	Aerojet unsuccessful in firing a complete SADARM projectile.
April 1985	Honeywell successfully demonstrated 8-inch SADARM.
July 1986	New SADARM program for use in 155-mm. howitzers and Multiple Launch Rocket Systems scheduled to enter engineering development.

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