UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D C 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

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RELEASED

The Honorable Ted Stevens
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

Subject: Analysis of HARM Procurement Strategies (GAO/NSIAD-83-59)

Dear Mr. Chairman:

As requested in your letter of June 24, 1983, we have made an analysis of the procurement strategies proposed for the High Speed Anti-Radiation Missile (HARM) program. The enclosed Appendix outlines a number of reservations we have about the strategy outlined in the letter the Deputy Secretary of Defense sent you on June 16, 1983.

In our opinion, the Deputy Secretary's proposal, which defers competition until a low-cost seeker is developed, will have little impact on reducing the overall cost of the HARM program because the low-cost seeker will probably not be available until after most HARMs are scheduled to be procured. Furthermore, it is not clear to us that this strategy will expand the mobilization base as effectively as the Navy's two-source strategy. We found that the two-source strategy is still a viable option; however, we believe that there can be little assurance about the extent price competition will provide a return on the investment which must be made to bring the second source on line.

In conducting this analysis, we interviewed officials in the HARM program office as well as others in the Navy, Air Force, and Office of the Secretary of Defense (OSD). We met with representatives from Texas Instruments, Bendix, Ford Aerospace, and Raytheon, and visited the Naval Weapons Center at China Lake, California. We reviewed reports, plans, briefing materials, design documents, and cost estimates related to the HARM program.

Due to a limited amount of time for doing the audit work, our focus was on the alternative acquisition strategies, their potential benefits, and the reasonableness of the strategy selected by OSD. In addition, we reviewed the feasibility of developing a reduced cost seeker for HARM. We did not address affordability, technical performance, testing, overall program management, requirements determination, and threat analysis.

There was insufficient time in which to solicit official Department of Defense comments on Appendix I. We did, however, discuss a draft of the document with personnel from the OSD, the Air Force, and the Navy who are familiar with the HARM program and their informal comments have been incorporated as appropriate.

Sincerely yours,

Frank C. Conahan
Director

Enclosure

ANALYSIS OF PROPOSED HARM PROCUREMENT STRATEGIES

By letter of June 24, the Chairman of the Defense Subcommittee of the Senate Appropriations Committee requested that we analyze the various procurement strategies proposed for the High Speed Anti-Radiation Missile (HARM) program and associated low-cost seeker development effort, including the impact its development might have on the quantities of HARM missiles planned for procurement.

OSD STRATEGY

In December 1982, the Congress appropriated $239.6 million to procure HARM missiles in fiscal year 1983 of which $80 million was provided specifically for establishment of a second source. But in June 1983, the Deputy Secretary of Defense wrote to Chairman Stevens saying:

> "Our investigation of the feasibility of further reducing the cost of HARM through near-term prime-level competition yielded negative results.
>
> "Developing a second producer of HARM would require an investment of about $300 million. Because of the cost control/cost-reduction measures that have already been initiated on the HARM program, we would need to buy more than 17,000 missiles to justify this expense. This bottom line was reached by our Cost Analysis Improvement Group (CAIG) after careful review of the hard facts associated with previous competitive procurements. Although we will strive for additional reductions in the cost of HARM, we have concluded that HARM is just too expensive for us to remain firm in our plan to fill the ... unit inventory requirement with a missile of the current design. This fact further weakens the Navy analysis that suggests we would benefit from developing a second prime contractor today. We must develop a lower cost HARM and we are confident that this is possible.

"As you know, we have recently made progress on anti-radiation seeker technology in the Anti-Radiation Projectile (ARP) program that shows a low cost seeker is feasible. I believe that a form, fit, and function replacement for the HARM seeker based on this lower cost technology offers us the best type of competition for the current HARM. Under our planned acquisition strategy, upon completion of the development effort, the low cost seeker will be incorporated into the HARM production as a block change. At that point two contractors will begin to compete for the major share of the production effort."

NAVY STRATEGY AND ESTIMATE

In essence, the decision announced by the Deputy Secretary rejects a long-standing plan of the Navy's developing agency to establish a second prime contractor for production missiles of the present HARM design. That plan was developed to increase the mobilization base for the HARM. According to the Navy, bringing the second source on line would cost an additional $155 million for qualification, special tooling and test equipment. However, the Navy projected that price competition among the two prime contractors would lead to reduced unit prices for the missile which would repay the investment after procurement of about 5,000 missiles and thereafter save the Government as much as $850 million in comparison to procurement of all missiles from a single prime contractor.

According to the Navy's program office, the two-source plan would result in procurement of fewer missiles in the initial years as the second source builds his production capacity. However, in 1986 when price competition begins, cumulatively more missiles would be produced than under the single source alternative. See table 1.

TABLE 1

Comparison of Cumulative Procurement Quantities

Fiscal Year	1983	1984	1985	1986	1987	1988	1989
Two Sources	544	1,208	2,785	5,557	8,145	10,947	13,947
Single Source	688	1,332	2,964	5,402	7,501	9,616	12,616
Difference	-144	-124	-179	+155	+644	+1,331	+1,331

AIR FORCE POSITION

The Air Force, for whom the Navy was to procure approximately half of those missiles, would prefer to see the second-source investment used to procure additional missiles in the early years of the program. The Air Force is skeptical about the Navy's ability to maintain the two-source procurement rate reflected in Table 1. In fact, the Air Force expects the maximum cumulative shortfall in the early years will be several times that shown in the difference row of Table 1. For the same reason the Air Force does not support the low-cost seeker development which is discussed below.

CAIG'S ESTIMATE

The CAIG's review cited by the Deputy Secretary of Defense in his letter to the Chairman assumed that the second source could not produce missiles at a lower cost than projected for the present prime contractor and that, as a consequence, price competition would not result in savings at the planned procurement level. This means that full recoupment of the second-source investment would not occur. While both estimates are necessarily speculative, the Navy estimate appears to be based on more balanced and supportable assumptions.

In spite of the fact that fixed price offers had been received from three potential second sources, the CAIG chose not to consider them in estimating what it would cost to procure missiles from a second source. The Navy, on the other hand, used the offers but

only after they made adjustments to account for the possibility that the contractors' proposals might have been too optimistic.

Also, the CAIG estimate includes only the costs of the guidance, control, wings and fins. This ignores some areas of potential cost reduction, such as integration, assembly and engineering support. The Navy estimate takes account of these other factors.

NAVY STRATEGY VIABLE

With the $80 million Congress appropriated to establish a second source, it is still possible to execute a contract with one of three potential second-source offerors and carry out the Navy's plan to broaden the mobilization base for HARM. It is not clear to us that following the strategy outlined by the Deputy Secretary will so effectively expand the mobilization base for the HARM missile.

So far as we have been able to determine through discussions with the designated Source Selection Authority, there is at least one responsive and responsible second-source offeror to whom award can be made immediately. Furthermore, reasonable efforts have been made to assure that the design documentation which the second source will use is not defective in any significant way.

In our opinion, there can be little assurance about the extent second-source investment costs will be recovered through the effect of price competition at the prime contractor level. The Congress, however, in appropriating funds to establish a second source producer has not insisted on such assurance. Award of the second source contract would seem to be more in consonance with stated Department of Defense procurement policy that, "All procurements, whether by formal advertising or by negotiation shall be made on a competitive basis to the maximum practicable extent."

LOW COST SEEKER

The Deputy Secretary's strategy would defer dual-source competition until a low-cost seeker is developed from Anti-Radiation Projectile (ARP) technology. Neither the CAIG nor the Navy estimates discussed above addressed the question of developing a low-cost seeker for the HARM. The Navy, however, has separate estimates which suggest that the additional cost to develop such a seeker would be about $165 million. The Navy optimistically projects that the new seeker will be as much as 40 percent less expensive than the present HARM seeker which accounts for about 50 percent of the cost of a HARM missile.

The documents that we examined suggest that realistically such a seeker will not be ready for production until about fiscal year 1990 when the currently planned procurement of HARM missiles will be nearly finished. Procurement of HARM could be curtailed until the new seeker is ready for production, but the stated urgency of the need for HARM would seem to rule out such an alternative. Therefore, unless procurement plans change, few HARM missiles would remain to be produced with the new seeker.

As seen above, the CAIG estimate suggests that price competition for the planned procurement would not likely repay $300 million in second-source investment costs. If the $165 million to develop the new seeker is added to those investment costs and price competition is limited to substantially fewer missiles, the prospects of repayment must be much more unlikely. In our opinion, therefore, the Deputy Secretary's strategy for deferring dual-source competition until a new seeker is available is not likely to reduce the overall costs of the HARM program. Clearly, such a strategy will not expand the mobilization base for HARM as quickly as the Navy's two-source approach.

ARP TECHNOLOGY

Adaptation of the ARP technology in the design of seekers for future anti-radiation missiles does seem promising. This is particularly so with respect to missiles smaller than HARM that could be conveniently carried as self-protection weapons by tactical aircraft. Eventually, the fielding of such smaller anti-radiation missiles might lessen the need for HARM. However, no DOD official we spoke with indicated there is a plan or study which suggests a specific reduction can or should be made in the HARM procurement objectives in anticipation of the development of such smaller, self-protection missiles. So far as we were able to determine, the planned procurement objective for HARM missiles is reasonably firm at about 17,000.

There is little reason to believe that the overall cost of the HARM program would be reduced through development of a new seeker based on ARP technology. Consequently, it is our opinion that any seeker development designed to exploit ARP technology should be initiated as a new program and not as a component effort of the HARM program.