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PROCUREMENT

Assessment of DOD's Multiyear Contract Candidates

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The Honorable John C. Stennis
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

Dear Mr. Chairman:

In response to your March 26, 1987, request, we analyzed the nine multiyear procurement candidates proposed in the Department of Defense's (DOD's) fiscal years 1988-89 budget request to determine if each satisfied legislative criteria for multiyear procurement. The results of our work which was discussed with your representatives on July 1, 1987, are summarized below and presented in detail in appendixes III and IV.

Public Law 97-86 established the conditions that must be met by multiyear candidates to ensure a reasonable balance of benefits and risks. The law requires that the government benefit from a multiyear contract by saving money and improving contractors' productivity. The law also stipulates that the estimated contract costs and projected savings be realistic and that the system's requirement, funding, and design be stable. We believe each multiyear procurement candidate should be judged on its own merits through a case-by-case assessment of the potential benefits and risks in awarding a multiyear contract instead of a series of annual contracts.

DOD estimates that the nine multiyear contract candidates will require about $9.3 billion in then-year dollars[1] to complete the planned multiyear procurements. Projected savings from these procurements are dependent on increased funding in the early years of the multiyear periods when compared to the annual contract funding. DOD budget submissions for the nine candidates requested an additional $68.8 million in obligational authority for fiscal year 1988 and an additional $236.9 million in obligational authority for fiscal year 1989 compared to their estimated requirements

[1]Then-year dollar expenditures include estimated inflation for the years in which the expenditures are expected to occur; constant dollar expenditures eliminate the effect of inflation.

under annual procurements. Using multiyear contracts instead of annual contracts will save about $908 million in then-year dollars, or about 8.9 percent, according to DOD.

While we recognize that the cost data in DOD's justification materials are preliminary budget estimates which are expected to become more exact with time, it is important to emphasize that little confidence can be placed in most of these estimates. Program offices generally estimated contract costs based on limited historical cost data and little or no formal cost information provided by the contractor. Most offices assumed that multiyear procurement would save money and made limited attempts to determine how and to what extent multiyear contracting might reduce costs based on the specifics of their individual systems. For example, the TOW-2 project office simply assumed that multiyear contracting would save 12 percent, based on a letter from the Department of the Army and on recent congressional language concerning expected levels of benefits from multiyear contracting.

Defense Appropriations Acts since fiscal year 1984 have provided that final multiyear procurement approval is reserved until negotiated contract prices are submitted to the Congress and the proposed savings are validated. In view of the high level of uncertainty associated with many of the estimates in the budget justification materials, it will be particularly important for the Congress to examine the negotiated prices and the validation of expected savings.

We found that two of the nine candidates proposed for multiyear procurement, the F-16 aircraft and the CH-47D helicopter, generally met the criteria of Public Law 97-86. For the other seven candidates, we have identified areas of increased risk that must be weighed against the potential savings to determine whether multiyear procurement authority should be granted. A brief overview of these seven candidates and the risks that each may present in terms of multiyear contracting follows.

-- The AN/ALQ-136(V)2 Radar Jammer does not clearly meet the stable design criterion because the system is still in engineering development, has not completed development and initial operational testing, and has not been produced,

except for test models. The Army intends to complete initial operational testing in September 1987. In the budget request, the Army rated the risk of design instability as low because of the technical similarity to its predecessor, the AN/ALQ-136(V)1/5 Radar Jammer. However, the (V)2 Jammer appears to represent a significant model change from the already produced (V)1/5 Jammer. The (V)2 Jammer is larger, heavier, and more complex than the (V)1/5, and is expected to operate in a more difficult environment. A program official said that the two jammers are not sufficiently similar to permit direct cost comparisons. In addition, we do not agree with the Army's method for estimating annual and multiyear contract costs, as discussed in appendix IV.

-- The High Mobility Multipurpose Wheeled Vehicle (HMMWV), which the Army intends to procure based on a competitive multiyear contract, does not clearly meet the stable design criterion. The proposed multiyear contract would procure five basic HMMWV models, two of which have not completed initial production testing and have not been produced, except for test models. Testing of one of these models through June 1987 has identified significant weight-related problems that will require modifications and retesting. Testing of the other model began in July 1987. Failure to satisfactorily complete the tests and evaluation by September 1987 will likely delay the contract award planned for June 1988. The technical data package cannot be finalized until testing is completed and, without the package, the Army cannot begin the multiyear contract competition. Army officials told us that they consider the contract schedule to be "high risk" because of the potential delay in acquiring the package. If the contract award is delayed beyond September 1988, it may be more appropriate to consider multiyear procurement beginning in fiscal year 1989 and continue to procure vehicles in fiscal year 1988 under the option provision of the current contract. In addition, the HMMWV program office revised the contract cost estimates submitted to the Congress, decreasing projected multiyear savings from 12.3 percent to 10.3 percent, but has not submitted new justification materials to the Congress. Further revisions to cost and quantity estimates are needed because of errors and changes in plans.

-- The TOW-2 missile system does not fully meet the stable design criterion. The Army is developing two enhanced versions of the missile, the TOW-2A and the TOW-2B. The TOW-2A began initial production in April 1987 and, although all tests and evaluations have not been completed, Army officials were confident that the design would be stable before contract award. The TOW-2B concept is currently being evaluated. The Army plans to award a development contract in September 1987 and begin production about September 1990. The TOW-2B involves substantial changes to the warhead, sensors, software, and mode of engagement. If the TOW-2B is not approved for production during the multiyear contract term, Army officials plan to substitute TOW-2A missiles in its place. This plan decreases the risk associated with design stability.

-- Office of the Secretary of Defense (OSD) officials reduced the Navy's original fiscal year 1988 budget request for the Harpoon missile and directed the Navy to submit the Harpoon as a multiyear candidate. Navy officials do not believe they can achieve the 10-percent level of savings cited in the multiyear justification materials. After the budget submission, the Harpoon program office reestimated annual and multiyear contract costs, and now estimates that the total 5-year multiyear program shown in the fiscal years 1988-89 budget is underfunded by about $78 million. According to the revised estimates, a savings of 7.9 percent is possible if the additional funding is available. In addition, the Harpoon does not meet the stable design criterion because a version of the missile, which constitutes one-third of the planned procurement, is still in engineering development and because other significant "form, fit, and function" modifications are planned. Navy program officials said that multiyear procurement is not appropriate for a system undergoing these types of changes. The Senate and House Armed Services Committees have denied advance procurement funding and multiyear procurement authority for the Harpoon for fiscal year 1988.

-- The Marine Corps (the user) and the Army (the procuring agency) disagree on expected multiyear contract savings

for the Hawk missile. In a situation similar to that of the Harpoon, the Marine Corps submitted the Hawk as a multiyear candidate following an OSD budget reduction, but could not provide documentation to support its savings estimate of 13.1 percent. It appears that the estimate of savings was primarily set by the need to accommodate OSD's budget reduction. An independent Army study of an earlier multiyear contract proposal submitted by the contractor (which was cited by the Marine Corps as supporting the current proposal) determined that there would be virtually no savings compared to the estimated costs of annual procurements. The Army project office intends to assess the merits of the Marine Corps' planned multiyear procurement when firm contractor proposals are received. The Marine Corps and the Army need to resolve the questions about savings before multiyear authority is approved. The House Armed Services Committee deleted advanced procurement funds and denied multiyear procurement authority for the Hawk for fiscal year 1988.

-- The Defense Meteorological Satellite Program (DMSP) does not meet the stable design criterion. The 5D-3 model proposed for multiyear procurement is still in development and has not been produced. First delivery of its predecessor, the 5D-2 Improved satellite, has been delayed until November 1987 because of needed modifications and production delays. In addition to being technically more sophisticated, larger, and heavier than its predecessor, the Air Force identified 13 design changes that have to be incorporated, tested, and their costs definitized before the multiyear contract award for 5D-3 production, scheduled for May 1988. The Air Force said there is a low risk associated with design stability, pointing out that the National Oceanographic and Atmospheric Administration (NOAA) is currently operating a very similar satellite. We recommended in our April 1987 report[2] that the Secretaries of Defense and Commerce converge their weather satellite system to the maximum extent possible. Even if the total requirement is not reduced, savings due to

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[2]Economies Available by Converging Government Meteorological Satellites (GAO/NSIAD-87-107, April 1987).

quantity discounts may still be possible by combining DOD and Commerce purchases under one contract.

-- A final evaluation of the relative costs and benefits from multiyear procurement of the Imaging Infrared (IIR) Maverick missile is not possible at this time. As a result of competitive contracts, the Air Force is revising the multiyear justification package and also considering delaying the start of a multiyear contract until fiscal year 1990 or later. The Air Force's fiscal year 1988 budget request and the multiyear justification materials submitted to the Congress were based on 1985 and prior contract cost data. The recent 1986 and 1987 contract awards, reflecting the favorable results from competition, showed that the budgeted costs for missiles are substantially overstated for the planned procurement quantity. Accordingly, the Air Force program office is revising the justification materials based on lower unit prices. Officials plan to increase the number of missiles to be procured under the multiyear contract rather than decrease total funding requirements. The Air Force is also considering another alternative: continuing competitive dual contract awards in fiscal year 1989 which would delay the start of a multiyear contract until fiscal year 1990 at the earliest. A winner-take-all multiyear contract ending in fiscal year 1992 would likely mean a sole-source situation for subsequent procurements planned through fiscal year 1997. Stability of funding for the Maverick is questionable. Its funding history has been turbulent and the House Armed Services Committee has recommended reductions in both the Air Force and Navy fiscal year 1988 budget requests.

As part of this review, we attempted to assess the industrial base enhancements expected from the multiyear candidates. However, program offices had little additional information concerning enhancements beyond that included in the justification packages. DOD officials told us that most of the information is theoretical in nature, because it is difficult to identify in advance the enhancements that will occur as a result of a multiyear contract that would not have occurred under annual contracts.

Appendix I discusses our objective, scope, and methodology used to evaluate DOD's multiyear candidates. Appendix II describes the criteria that candidates must meet. Appendix III presents our analysis of DOD's multiyear justification package and appendix IV presents the details of our review of each candidate.

We discussed our findings with officials from OSD; the Army, Navy, and Air Force Headquarters; and the individual program offices and have included their views where appropriate. As requested, we did not obtain official DOD comments on this report.

We are sending copies of this report to the Chairmen, House Committee on Government Operations, Senate Committee on Governmental Affairs, and House and Senate Committees on Appropriations and on Armed Services. Copies are also being sent to the Secretaries of Defense, the Army, the Navy, and the Air Force, and other interested parties.

Sincerely yours,

Frank C. Conahan

Frank C. Conahan
Assistant Comptroller General

Contents

ABBREVIATIONS

DMSP	Defense Meteorological Satellite Program
DOD	Department of Defense
GAO	General Accounting Office
HMMWV	High Mobility Multipurpose Wheeled Vehicle
IIR	Imaging Infrared
NOAA	National Oceanographic and Atmospheric Administration
OSD	Office of the Secretary of Defense
SLAM	Standoff Land Attack Missile

OBJECTIVE, SCOPE, AND METHODOLOGY

Our objective was to evaluate the justifications for the nine multiyear candidates included in DOD's fiscal years 1988-89 budget request to determine if they met the criteria established by the Congress. For each candidate, we reviewed the

-- acquisition strategy;

-- contract costs and savings estimating methodology;

-- system requirements;

-- funding, production, and delivery schedules;

-- test results;

-- engineering changes not yet tested or incorporated in the production item;

-- schedules for implementing the multiyear program; and

-- benefits involving enhancements to the industrial base.

We performed our work at the following locations:

-- Office of the Assistant Secretary of Defense (Comptroller), Washington, D.C.

-- Headquarters, U.S. Army, Washington, D.C.

-- Headquarters, U.S. Navy, Washington, D.C.

-- Headquarters, U.S. Air Force, Washington, D.C.

-- U.S. Army Aviation Systems Command, St. Louis, Missouri.

-- U.S. Army Missile Command, Huntsville, Alabama.

-- U.S. Army Tank Automotive Command, Warren, Michigan.

-- Naval Air Systems Command, Washington, D.C.

-- Air Force Systems Command's Aeronautical Systems Division, Wright-Patterson Air Force Base, Ohio.

-- Air Force Systems Command's Space Division, El Segundo, California.

We discussed our findings with officials at OSD, military service headquarters, and the program offices. Our work was performed from April through July 1987 in accordance with generally accepted government auditing standards.

THE CRITERIA FOR MULTIYEAR PROCUREMENT

Multiyear procurement is a method for acquiring up to 5 years' requirements of systems or subsystems with a single contract. In 1981 the Congress authorized DOD to use multiyear procurement for major systems and since fiscal year 1982, DOD has proposed acquiring weapon systems or subsystems in that manner.

Although multiyear procurement can benefit the government, it can also entail certain risks. Accordingly, in Public Law 97-86, the Congress established criteria that multiyear candidates must meet to limit those risks. The criteria require that the minimum requirement for the system be expected to remain substantially unchanged, sufficient funding be requested by DOD to carry out the contracts, the design be stable, and estimated contract costs and savings be realistic. Some of these criteria have been further refined by our office, DOD, and the congressional committees, as discussed below.

BENEFIT TO THE GOVERNMENT

It is generally recognized that the cost savings to be achieved should be significant because multiyear contracting can reduce future budget flexibility and can entail some added risks, particularly if the requirement, design, and/or funding prove to be unstable or if cost estimates ultimately prove to be inaccurate. If a multiyear contract were awarded and later changed significantly or terminated, the ultimate cost could be higher than under annual contracting. Further, cost savings must offset additional government borrowing costs associated with accelerated expenditures under multiyear contracting.

In our opinion, each proposed multiyear contract should be evaluated on its own merits, weighing the margin of savings against added risks and any other uncertainties. The savings should be high enough to offset any additional risks of entering a multiyear contract. For example, a candidate with no risks in terms of requirement, funding, or design stability, and in which a high degree of confidence in the cost estimate exists, may provide only a small percentage or amount of savings. If the savings are essentially ensured, they may be judged substantial enough to take advantage of multiyear contracting. In contrast, a candidate with high projected savings may be inappropriate for multiyear contracting if the design, funding, and/or requirement is unstable or if the cost estimate is not based on sound information and logic.

Accordingly, we believe savings should be assessed in relation to the risk or absence of risk in the (1) confidence in the cost estimate, (2) requirement stability, (3) funding stability, and (4) configuration or design stability.

DEGREE OF COST CONFIDENCE

This legislative criterion requires that the contract cost estimates and the anticipated cost savings be realistic. Estimates should be based on historical data for the same or similar item, or a proven estimating technique. Cost savings is figured as the difference between cost estimates, proposals, or negotiated prices for the multiyear contract and the cost of procuring the same quantities in the same time frames with successive annual contracts.

Initially, the military services produce budgetary estimates of the potential savings available from multiyear contracting. These estimates are usually based on prior procurement history, informal information from contractors, and/or in-house estimates. These estimates are normally the basis for the original multiyear justifications submitted to the Congress. Confidence in the cost estimates can be increased by receiving firm proposals from the applicable contractor on both an annual and multiyear basis, and then comparing and analyzing those proposals. Negotiating both the annual and multiyear prices with the contractor provides an even firmer method of defining the savings. However, this is not always practical, and DOD officials stated that the additional administrative effort and the cost to negotiate both must be considered.

To provide greater assurance of the validity of estimated savings, the Congress has mandated a two-step multiyear approval process: proposed multiyear contract costs are provided both with the budget submission and again just before contract award. Defense Appropriations Acts since fiscal year 1984 have included language that reserves final multiyear approval until negotiated contract prices are submitted to the House and Senate Armed Services and Appropriations Committees at least 30 days in advance of contract award. This allows the Committees to compare the estimates presented in the justification packages with the actual proposed contract amounts.

STABILITY OF REQUIREMENT

The need for the system or subsystem must be relatively stable and remain so throughout the multiyear procurement period. A stable requirement means the total quantity and procurement rate

will not vary significantly (especially downward) over the term of the multiyear contract. Decreases in the procurement quantities can cause termination of the multiyear contract and create unit cost increases, which could reduce savings.

STABILITY OF FUNDING

There should be a reasonable expectation that program funding will be available at the required level for the multiyear contract period. Both DOD and the Congress must be committed to ensuring that sufficient funds are provided to complete the multiyear contract at planned production rates. A turbulent funding history for a weapon system may suggest an unstable requirement, a relatively low funding priority, or wavering support; this may make it inappropriate for multiyear contracting. Disagreements among the military services, OSD, and the Congress concerning the appropriate production rate and required funding for a system are often signals that funding is not stable.

STABILITY OF DESIGN

The design of a system or subsystem should be stable before initiating multiyear procurement. Test and evaluation should be complete and demonstrate that the system or subsystem is operationally effective. The Senate Committee on Appropriations, in previous reports on the DOD appropriations bills, indicated a similar view that the multiyear approach must be reserved for established production operations and state-of-the-art technology. Moreover, a program should be judged mature and stable only after research and development and one or two production runs have been completed successfully.

INDUSTRIAL BASE ENHANCEMENT

The multiyear justification packages submitted to the Congress include statements about industrial base enhancements related to each of the candidates. These enhancements include

-- improved competition,

-- enhanced investment,

-- improved vendor skill levels,

-- training programs,

-- progress payment changes,

-- use of multiyear contracting for vendors, and

-- increased production capacity.

It is generally recognized that the stability in contractor and subcontractor operations associated with multiyear contracts can create a level of business certainty more conducive to enhancing the industrial base than annual procurements which are more likely to fluctuate. Nevertheless, in most instances, it is difficult, if not impossible, to identify in advance the industrial base enhancement that will occur as a result of a multiyear contract that would not have occurred under annual contracts.

ESTIMATED SAVINGS FOR CURRENT MULTIYEAR CANDIDATES

In the fiscal years 1988-89 budget, DOD submitted nine candidates for multiyear procurement to the Congress for its review and approval. DOD estimated that multiyear procurement could save $907.7 million in then-year dollars, or about 8.9 percent less than the estimated cost of procurement based on annual contracts for the nine candidates. (See table III.1.)

Table III.1: DOD Cost and Savings Estimates for Fiscal Years 1988-89 Multiyear Candidates in Then-Year Dollars

System	Estimated contract cost and savings			
	Annual	Multiyear	Savings	Percent[a]
	(in millions)			
Army:				
Radar Jammer	$ 88.5	$ 68.6	$ 19.9	22.5
CH-47D	580.0	532.1	47.9	8.3
HMMWV[b]	1,020.6	915.2	105.4	10.3
TOW-2[c]	440.3	387.3	53.0	12.0
Navy:				
Harpoon	612.4	551.1	61.3	10.0
Hawk[d]	441.2	383.6	57.6	13.1
Air Force:				
DMSP	538.6	447.7	90.9	16.9
F-16	4,561.6	4,299.6	262.0	5.7
IIR Maverick[e]	1,905.6	1,695.9	209.7	11.0
Total	$10,188.8	$9,281.1	$907.7	8.9

[a]Savings divided by annual contract costs.

[b]This and subsequent analyses are based on the HMMWV program office's revised justification package dated March 1987.

[c]Includes Marine Corps quantities.

[d]Procured by the Army for the Marine Corps.

[e]Includes Navy quantities.

Because the rates of government expenditures differ under annual and multiyear procurement methods, present value analysis is used to put the annual and multiyear estimates on a comparable basis.

Present value analysis can be used to compare the two procurement alternatives to reflect the time value of money. Although present value analysis is a generally accepted practice, selecting an appropriate interest rate has been a subject of controversy. Because most government funding requirements are met by the Treasury, we believe its estimated cost to borrow is a reasonable basis for establishing the interest rate to be used in present value analyses. Accordingly, for our analyses, we used the average yield on outstanding marketable Treasury obligations that have remaining maturities similar to the period involved in the analysis and applied that rate to then-year dollars. DOD uses the Office of Management and Budget Circular A-94's prescribed present value method, which applies a flat 10-percent discount rate to constant dollars.

Our present value analysis of all the fiscal years 1988-89 candidates, as shown in table III.2, shows projected savings of about 7.1 percent. DOD's present value analysis shows savings of about 5.8 percent.

Table III.2: Comparison of DOD and GAO Present Value Savings for Fiscal Years 1988-89 Multiyear Candidates

System	DOD present value savings		GAO present value savings	
	Amount	Percent[a]	Amount	Percent[b]
	(in millions)		(in millions)	
Army:				
Radar Jammer	$ 11.4	19.3	$ 14.5	21.1
CH-47D	23.4	6.4	27.3	7.1
HMMWV	59.4	10.5	69.0	10.4
TOW-2	36.1	12.1	36.5	12.1
Navy:				
Harpoon	31.7	8.6	37.9	9.2
Hawk	13.3	4.9	26.7	8.6
Air Force:				
DMSP	35.1	10.9	50.3	13.4
F-16	48.9	1.9	98.8	3.4
IIR Maverick	90.5	7.9	112.6	9.1
Total	$349.8	5.8	$473.6	7.1

[a]Savings divided by DOD's present value annual cost.

[b]Savings divided by GAO's present value annual cost.

Just as the estimated savings for each candidate varies, so does the source of the savings. The majority of the savings for DOD's multiyear contract candidates has been associated with procurement of vendor and subcontracted items on a more economical basis than is possible with a series of annual procurements. Multiyear contracting allows economic order quantity procurements: rather than procure subcontracted parts and materials in annual lots of limited sizes, the prime contractor can procure parts in larger lots, thereby obtaining lower prices from subcontractors. However, the government must make a contractual commitment to the prime contractor to either procure the larger multiyear total quantity or pay termination costs if quantities are later reduced. The commitment to larger advance procurements usually requires additional funding in the early years of a multiyear contract.

Table III.3 shows the sources of savings for the nine multiyear candidates, as reported by DOD.

Table III.3: Sources of Estimated Multiyear Procurement Savings in Then-Year Dollars for Fiscal Years 1988-89 Candidates

	Total savings	Percent of total estimated savings
	(in millions)	
Vendor procurement	$428.5	47.2
Manufacturing	255.8	28.2
Inflation	112.8	12.4
Other	110.6	12.2
Total	$907.7	100.0

OUR ASSESSMENTS OF THE FISCAL YEARS 1988-89 MULTIYEAR PROCUREMENT CANDIDATES

We reviewed OSD's justification materials submitted to the Congress in January 1987 for the nine multiyear procurement candidates proposed in the fiscal years 1988-89 budget request. In the case of the HMMWV, we also reviewed the Army program office's revised justification package, dated March 1987, which had not been submitted to the Congress at the time of our review. We reviewed the justification materials to assess their conformance with the legislative criteria for multiyear procurement (Public Law 97-86).

Table IV.1 summarizes our views of whether each candidate satisfied the criteria. Each "X" identifies an instance where, in our opinion, a candidate does not clearly meet the criterion. An "X" does not necessarily mean that the system is an inappropriate candidate. Instead, each "X" indicates an area of increased risk that must be weighed against the potential savings to determine whether multiyear procurement authority should be granted. Regarding our assessments for the cost confidence criterion, we note that (1) various methods were used by the program offices, some better than others, to derive the cost estimates and (2) the cost data in the justification materials are preliminary budget estimates which should become more precise with time. Our individual assessments of each candidate follow table IV.1.

Table IV.1: Fiscal Years 1988-89 Multiyear Procurement Candidates Not Clearly In Conformance With Legislative Criteria

	Projected multiyear savings percent	Legislative criteria			
		Cost confidence	Stability		
			Requirement	Funding	Design
Army:					
Radar Jammer	22.5	X	-	-	X
CH-47D	8.3	X	-	-	-
HMMWV	10.3	X	-	-	X
TOW-2	12.0	X	-	-	X
Navy:					
Harpoon	10.0	X	-	X	X
Hawk	13.1	X	-	X	-
Air Force:					
DMSP	16.9	X	-	-	X
F-16	5.7	-	-	-	-
IIR Maverick	11.0	X	-	X	-

AN/ALQ-136(V)2 RADAR JAMMER

The AN/ALQ-136(V)2 Radar Jammer is an advanced automatic radar jamming set intended for use on the Army's Special Electronic Mission Aircraft. The Jammer will provide protection against surface-to-air missiles, air-to-air interceptors, and anti-aircraft artillery. It is the second generation of the AN/ALQ-136(V)1/5 Radar Jammer currently used by the Scout/Attack helicopters. The (V)2 Jammer is more complex, larger, and heavier than the (V)1/5 Jammer and will operate in a significantly more complicated and stringent threat environment.

The (V)2 Jammer is still in development and six test units are scheduled to be delivered under an engineering and development contract. Research and development funds were appropriated in fiscal years 1983-87 but none were requested for fiscal years 1988-89, the proposed multiyear contract period. Over 1,000 (V)1/5 Radar Jammers were delivered under an annual production contract and a 3-year firm fixed-price multiyear contract.

The Army proposes a sole-source, firm fixed-price multiyear contract for fiscal years 1988-89. The Army plans on procuring 169 (V)2 Jammers at a total estimated contract price of $68.6 million, which represents a cost avoidance savings of

$19.9 million, or 22.5 percent, compared to the estimated costs for two annual contracts. A contract option for an additional 338 jammers is also planned for potential requirements of special operations forces and other service needs. Army officials said that competition and/or second sourcing is impractical because the government does not own the technical data package. The Army's acquisition plan indicates that a single-year instead of a two-year procurement of the 169 jammers would be the optimal strategy. However, according to Army officials, this option was considered too expensive considering other funding priorities.

Historical cost information was not available for the (V)2 Jammer so the project office estimated contract costs based on data provided by the contractor and other government estimates. An Army official stated that the (V)1/5 Jammer is not sufficiently similar to the (V)2 Jammer to allow direct cost comparisons to be used.

For the multiyear contract cost estimate, the Army assumed that multiyear contracting would save money, and reduced the contractor cost estimate. For the annual contract cost estimate, the Army assumed that two annual contracts would be awarded. It added about $5.7 million to the cost of the second contract for special tooling, first article testing, and a complete new technical data package. However, according to the Army, the data package would not be procured and tooling and testing expenses may not be incurred. The estimated savings from multiyear procurement would decline to 17 percent if the entire $5.7 million were deleted from the second annual contract cost estimate.

The lack of firm cost data, the unsupported assumption made concerning multiyear procurement savings, and the inclusion of inappropriate costs in the annual contract cost estimate, significantly reduce the confidence that can be placed in DOD's cost and savings estimates. The Army plans to request both annual and multiyear contract proposals which may increase the level of confidence in the final estimate of savings.

The (V)2 Radar Jammer also does not appear to meet the stable design criterion. The Army's justification states that the risk of design instability is low because of the technical similarity to the (V)1/5 Jammer. Nevertheless, the (V)2 Jammer is still in engineering development, has not completed development and initial operational testing, and has not been produced, except for test models. Initial operational testing is scheduled for completion in September 1987 and first article testing is scheduled during the third quarter of 1990. Project officials

told us the (V)2 Jammer is larger, heavier, and more complex than the (V)1/5, and was not sufficiently similar to the (V)1/5 to permit direct cost comparisons.

The requirement for at least 169 (V)2 Jammers appears stable and may be increased due to potential special operations forces and other requirements. DOD has provided sufficient funding in the budget to support a multiyear contract.

CH-47D HELICOPTER MODERNIZATION PROGRAM

The CH-47D Medium Lift Helicopter is a transport helicopter used for equipment and personnel transport, aircraft recovery, medical evacuation, and liquid or bulk cargo movement. The age of the current CH-47 fleet and its employment of 1950 technology dictated a need to modernize the fleet. This modification program updates and improves the CH-47A, B, and C models to the D configuration.

The proposed multiyear contract is expected to complete modification of the CH-47s. To date, 328 CH-47s have been or are currently being modernized. This includes 240 aircraft on the current fiscal years 1985-89 multiyear procurement contract. Development and operational tests of the modernized aircraft have been completed.

The proposed multiyear contract would modernize 108 helicopters and include an option to modernize an additional 36. The multiyear contract would be for fiscal years 1990-92 with advance procurement in fiscal year 1989. The Army estimates multiyear contract costs to be $532.1 million, which it believes represents a $47.9 million savings, or 8.3 percent, compared to its estimated costs of annual contracts.

The CH-47D program office plans to award the multiyear contract on a sole-source, firm fixed-price basis. Competition or second sourcing is not considered practical by the Army because the government does not own the technical data package and because of the large start-up costs and length of time required to qualify a second contractor. They also consider it impractical since the proposed multiyear contract would complete the program.

The Army estimated multiyear contract costs based on the cost history of the current multiyear contract. However, in developing annual contract cost estimates, the program office simply (1) assumed a level of savings expected from multiyear procurement and (2) increased the multiyear cost estimates for labor and materials by 10 percent.

To date, the modernization program has proceeded rather smoothly and the CH-47D generally meets the legislative criteria for multiyear procurement. The requirement, funding, and design appear to be stable and sufficient to carry out a multiyear contract with little risk. The inadequacy of the annual cost and savings estimates is a concern. However, the Army plans to receive both annual and multiyear contract proposals in January 1988. If both are obtained, the Army will be in a better position to evaluate multiyear savings. This contractor information should be helpful to validate the estimated savings of 8.3 percent (7.1 percent discounted).

HIGH MOBILITY MULTIPURPOSE WHEELED VEHICLE

The High Mobility Multipurpose Wheeled Vehicle (HMMWV) is a joint Army, Air Force, and Marine Corps program to replace 1/4 to 1-1/4 ton tactical vehicles with several versions of the 1-1/4 ton HMMWV. HMMWVs use a common chassis to accommodate different configurations. The HMMWV performs light-load vehicle requirements in combat, combat support, and combat service support roles.

In March 1983, the Army awarded a 5-year, $1.2 billion multiyear contract to procure 54,973 HMMWVs. Through May 1987, the Army had exercised options to acquire an additional 5,661 vehicles. The fiscal year 1988 budget submission requests $78 million to acquire another 2,485 HMMWVs under another option provision in the existing contract. This request is in addition to the fiscal year 1988 funding requested to procure 1,188 vehicles in fiscal year 1988 as part of the proposed multiyear contract.

The Army is proposing a competitive, firm fixed-price multiyear contract for fiscal years 1988-92. It plans to procure 35,326 HMMWVs for the Army and include a 100-percent option provision for Air Force, Marine Corps, foreign military sales, and additional Army requirements. In the original justification material submitted to the Congress in January 1987, the Army estimated a multiyear contract cost of $919.1 million, at a savings of $128.7 million (12.3 percent), compared to the costs of a series of annual contracts.

After the budget submission, the Department of the Army directed the HMMWV program office to revise these contract cost and savings estimates. In estimating annual contract costs, program officials had assumed that annual contracts would be competed, but Department of the Army officials believed that it was more realistic to assume sole-source annual procurements. The program office revised its estimates and now projects a multiyear

contract cost of $915.2 million and savings of $105.4 million, or 10.3 percent. These revised figures are contained in a justification package dated March 1987 which had not been submitted to OSD or to the Congress at the time of our review.

The five basic HMMWV models included in the proposed multiyear procurement are categorized as either Group I vehicles (utility cargo, armament, and TOW missile carriers) or Group II vehicles (shelter carriers and ambulances). Initial production testing of the Group I vehicles was completed in December 1984. We reported[1] that the vehicle tests showed improvements over prototype tests, but that important performance and reliability problems persisted. Army officials said most of these problems have since been corrected. Over 27,000 Group I vehicles have been accepted under the current contract and fielded under a conditional release (full release pending resolution of the remaining problems).

Group II vehicles have not been produced except for test vehicles. The shelter carrier model has undergone testing since August 1985; none of the tests have been successfully completed. Serious problems, mainly vehicle weight related, were identified in the first test phase. Some corrective modifications have been made, but not retested and evaluated. The second test phase was cancelled because of improper test procedures. The latest tests revealed major failures in the rear lower ball joints, rendering the vehicle inoperable. The contractor modified the ball joint and testing of the shelter carrier resumed in late June 1987. Testing of the ambulance model began in July 1987, according to Army officials.

Even though Group II vehicles only account for about 10 percent of the proposed procurement quantity, failure to complete testing and evaluation of all models by September 1987 will likely delay the Army's planned multiyear contract award in June 1988. Testing and evaluation must be satisfactorily completed before the technical data package can be finalized, reviewed, and accepted and, without the technical data package, planned competition cannot take place. According to the Army's procurement schedule, the technical data package must be accepted by October 1987 in order to solicit bids in December 1987 and award the contract in June 1988. In our opinion, further delays or additional problems that may be revealed in testing will

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[1]Problems with Army's High Mobility Multipurpose Wheeled Vehicle Continue (GAO/NSIAD-86-79, April 1986).

jeopardize this schedule. These risks relating to design stability need to be considered before multiyear procurement authority is granted. If the contract award is delayed beyond September 1988, it may be more appropriate to consider multiyear procurement beginning in fiscal year 1989 and continue to procure vehicles in fiscal year 1988 under the option provision of the current contract.

Program officials acknowledge that the multiyear contract award schedule is "high risk" because the technical data package may not be available when needed. Several alternative acquisition strategies have been discussed, each with major consequences on the budget and the multiyear procurement proposal. These alternatives include

-- continuing to procure HMMWVs under the option provision of the current contract,

-- awarding a multiyear contract for Group I vehicles now, and later negotiating the procurement of Group II vehicles as a change to this contract, or

-- procuring HMMWVs under sole-source annual contracts.

The HMMWV appears to meet the stable requirement and funding criteria. The Army expects total requirements for the HMMWV to increase as other vehicles are phased out. The Army has budgeted sufficient funding for the multiyear program.

TOW-2 MISSILE

The TOW-2 missile is a crew-portable or vehicle-mounted, heavy antiarmor weapon system consisting of a launcher and a tube-launched, optically-tracked, wire-guided missile. The TOW-2 represents the third generation of TOW missiles. The TOW-2 has a more lethal warhead, a more powerful flight motor, and other enhancements in comparison to its predecessors. As of March 31, 1987, the prime contractor had delivered 70,092 TOW-2 missiles under 6 annual production contracts. The Army is currently making improvements to the TOW-2: the TOW-2A version to counter the perceived armor threat in the near future and the TOW-2B version to provide an interim solution to the longer-term threat.

The Army proposes a multiyear contract for acquiring the guidance and control, and airframe components of the TOW-2A and the TOW-2B. The contract would cover fiscal years 1988-92 and procure a total of 60,124 missiles for the Army and the Marine Corps. The Army estimates a total multiyear contract cost of

$387.3 million, which they believe represents a savings of $53 million (12 percent), when compared to the Army's estimated cost of annual contracts.

Responding to congressional and OSD direction, the Army is also studying the feasibility of developing a second production source. During the summer of 1987, this competitive, dual-acquisition strategy will be compared to the multiyear contract proposal from the sole-source contractor to determine the best acquisition strategy. A second-source study completed in 1985 concluded that competition was not advantageous, and TOW-2 program officials doubt that the new analysis will change this position. They believe procurement quantities are too small to support two contractors. However, if a competitive, dual-acquisition strategy is adopted, the use of multiyear contracting would not be considered for fiscal year 1988, in our opinion.

OSD directed the Army to submit a multiyear procurement justification package in December 1986. The Army had not proposed the TOW-2 for multiyear procurement earlier, in part because of the OSD direction to study second sourcing. In developing multiyear and annual contract cost estimates, the program office simply assumed that multiyear contracting would save 12 percent. A program official said this figure was based on a letter from the Department of the Army and on recent congressional language concerning expected levels of benefits from multiyear contracting. While the Army made very limited efforts to support its savings estimate, it intends to request an annual contract proposal from the contractor which could be compared to a multiyear contract proposal and provide a better savings estimate.

The status of TOW-2A and TOW-2B enhancements raises some questions about design stability but Army plans may mitigate our concerns. The TOW-2A began initial production in April 1987 and, although all tests and evaluations have not been completed, Army officials were confident that the design would be stable prior to contract award. The TOW-2B concept is currently being evaluated. The Army plans to award a development contract in September 1987 and expects to begin production about September 1990. Significant design changes, integration, modification, and testing efforts are anticipated before the TOW-2B will be ready for production. The TOW-2B involves substantial changes to the warhead, sensors, software, and mode of engagement. If the TOW-2B is not approved for production during the multiyear contract term, Army officials plan to substitute TOW-2A missiles. This plan would decrease the risks associated with design stability.

The proposed funding and requirement appear to support a multiyear contract. The planned procurement quantity per year covers the minimum sustaining production rate of 12,000 TOWs per year (combined Army and Marine Corps).

HARPOON MISSILE

The Harpoon is an all-weather, antiship, cruise missile that can be launched from the air, surface, or underwater. It uses an active radar seeker, radar altimeter, and a digital computer for missile guidance and control. The Harpoon has been in full production since 1977 and all contracts have been awarded on a sole-source basis. At the time of our review, the Navy had procured 3,085 missiles. The Standoff Land Attack Missile (SLAM) is a version of the Harpoon which will replace the radar seeker with the IIR Maverick seeker. SLAM will be used against land targets and is in advanced development.

The Navy is proposing a multiyear contract to procure 886 missiles, including 280 SLAMs during fiscal years 1988-92. The contract would complete the Harpoon program. The SLAM version would represent 31.6 percent of the total quantity to be procured. The Navy estimates that a multiyear contract will cost $551.1 million and save about $61.3 million (10 percent) compared to its estimated cost for annual procurements.

The contract would be awarded on a sole-source, firm fixed-price basis. Navy officials did not consider competition because production is entering its last 5 years and they estimate that the costs of establishing a competitor would be greater than any savings from competition.

The Navy did not originally propose the Harpoon for multiyear procurement. OSD reduced the Navy's fiscal year 1988 budget request for Harpoon procurement and directed the Navy to submit support for a multiyear procurement. The Navy subsequently revised its cost estimates which show that the 5-year multiyear funding profile included in the fiscal years 1988-89 budget is underfunded by $78 million. This shortfall includes $9.8 million and $18.3 million in the fiscal years 1988-89 budget requests, respectively. If the additional funding is not received, Navy officials said the procurement quantity will have to be decreased. If the additional $78 million of funding is received, they estimate multiyear contract savings of $54.1 million, or about 7.9 percent of the revised annual contract costs. We did not validate the Navy's revised budget estimates, but we have little confidence in the cost data currently before the Congress.

We do not believe that the Harpoon meets the stable funding criterion because the program office projects a funding shortfall. In addition, the House and Senate Armed Services Committees have denied advance procurement funding and multiyear procurement authority.

The Harpoon also does not meet the stable design criterion. Several engineering changes, classified as significant class 1 "form, fit, and function" modifications are planned. In addition, the SLAM version, which constitutes almost one-third of the total planned procurement, is still in development. Significant design, integration, and testing will be required before initial production. Navy program officials do not believe multiyear procurement is appropriate for a system undergoing these kinds of changes.

HAWK MISSILE

The Hawk missile system provides an all-weather air defense of high priority assets and area coverage against aircraft. The system includes acquisition radar, a fire control center, high-power illuminators, and launchers. The Hawk was first deployed by the Army in 1960 and was modernized as the Improved Hawk in 1972; the Marines began fielding the Hawk in 1972.

As the procuring agency, the Army would order 2,118 guidance and control sections for the Marine Corps on a multiyear contract covering fiscal years 1988-91. This quantity would nearly complete the Marine Corps' planned program requirement. The Marine Corps estimates a multiyear contract cost of $383.6 million, which they believe represents a savings of $57.6 million (13.1 percent) compared to the estimated cost of four successive annual contracts. The multiyear contract would be a firm fixed-price award to the sole-source contractor. The Army did not consider dual sourcing to be worthwhile because (1) the quantities needed were not large enough and (2) the system is nearing the end of production. A 1987 Army-financed study recommended that Hawk missile procurement be competed, but the Army later decided against competition because of technical risks, cost, and scheduling problems.

In a situation similar to the Harpoon, OSD reduced the fiscal year 1988 Hawk budget by 12 percent and directed the Marine Corps to submit the Hawk as a multiyear procurement candidate. The Marine Corps attempted to develop annual and multiyear contract cost estimates from historical cost records. However, the need to show at least a 12-percent cost savings appeared to be the

primary influence in their cost-estimating methodology, in our opinion.

The Army performed an independent cost analysis of an earlier multiyear contract proposal submitted during the fiscal year 1987 budget cycle by the contractor. Its analysis, validated by the Army Missile Command, determined that there would be virtually no savings from multiyear procurement as proposed by the contractor. The Army project office intends to assess the merits of the Marine Corps' planned multiyear procurement when firm contractor proposals are received in August 1987. The Army and Marine Corps should resolve the differences and agree on a realistic estimate of savings before multiyear authority is approved.

The House Armed Services Committee deleted advance procurement funds and denied multiyear contracting authority for the Hawk in fiscal year 1988, while the Senate Armed Services Committee approved multiyear contracting authority. This difference will have to be settled in conference. Marine Corps officials said a multiyear contract is not viable without advance procurement funding because most of the expected savings result from economic order quantity purchases from vendors.

The Hawk requirement appears firm, with the multiyear contract quantity nearly satisfying the Marine Corps' remaining requirements. The Hawk also appears to meet the stable design criterion. There have been no major design changes in the last 4 years and none is currently planned for the guidance and control section.

DEFENSE METEOROLOGICAL SATELLITE PROGRAM

The Defense Meteorological Satellite Program (DMSP) is a joint-service program that furnishes meteorological data to support strategic and tactical operations on a worldwide basis. The major DMSP components include the spacecraft, the operational linescan system which is the primary meteorological sensor, launch vehicles, and ground systems.

DMSP Block 5D has been in production since 1972. The initial design, the 5D-1, has been succeeded by the 5D-2 model which is currently in operation. The 5D-2 Improved model is now being acquired under two multiyear contracts (one for the spacecraft and one for the operational linescan system) with first delivery scheduled in November 1987. The newest generation, the 5D-3 model, is in development.

The Air Force is proposing a multiyear contract to procure five 5D-3 satellites at an estimated cost of $447.7 million, which represents a savings of $90.9 million (16.9 percent), compared with the estimated cost of annual contracts. The Air Force is requesting $77.5 million in advance procurement funds for fiscal year 1988 with production scheduled for fiscal years 1989-91. The Air Force plans to award a sole-source, fixed-price-incentive-fee contract with award and performance fees to the spacecraft contractor. The contractor will purchase the operational linescan system under a subcontract arrangement.

The Air Force estimated multiyear contract costs for the 5D-3 model based on the cost experience from the current multiyear procurement of the 5D-2 Improved model, increased to account for cost growth and design changes. This seems to be a reasonable estimating methodology. However, they estimated annual contract costs based on contractor proposals which were over 4 years old, and did not provide us documentation to support their adjustments for cost growth and design changes. The Air Force has not decided whether to request both annual and multiyear contract proposals from the contractor. Without either an annual proposal or recent annual contract history, savings from multiyear contracting would be difficult to validate.

DMSP does not fully meet the stable design criterion. The 5D-3 model is still in development and the first delivery of its predecessor, the 5D-2 Improved model, is scheduled for November 1987. First delivery of the 5D-2 Improved was delayed because of late parts deliveries, needed modifications, and production delays. The 5D-3 model is technically more sophisticated, longer, and heavier than the 5D-2. In addition, the Air Force identified 13 planned design changes that have to be incorporated into the spacecraft and sensor configurations and their costs definitized prior to the multiyear contract award for 5D-3 production. Any delays or problems could affect the multiyear contract schedule. The Air Force currently plans to request a multiyear proposal in October 1987 and award the contract by May 1988.

Air Force program officials said there is low risk from a design stability standpoint. They said that the 5D-3 satellite is similar to the National Oceanographic and Atmospheric Administration's (NOAA's) weather satellites currently in operation. These officials also said that all modifications and upgrades will be completed before the multiyear contract award.

The DMSP appears to meet the stable funding and requirement criteria, although the total requirement could be affected if a

recommendation made in our April 1987 report[2] is carried out. We identified an opportunity to save money and eliminate duplication by converging DMSP requirements with those of the NOAA's weather satellite system. We recommended that the Secretaries of Defense and Commerce converge the systems to the maximum extent possible. This could include combining the Air Force's planned multiyear procurement and NOAA's planned procurement in fiscal year 1988. The Air Force stated that their requirement for five 5D-3 satellites was not affected because current discussions on convergence focus on later procurements. Even if the current requirement is not affected, savings due to quantity discounts may still be possible in our opinion by combining DOD and Commerce purchases under one contract.

F-16 AIRCRAFT

The F-16 Fighting Falcon is a single-engine, lightweight, high-performance aircraft designed for air-to-air combat and air-to-ground weapons delivery. The F-16 achieved initial operational capability in 1980. Over 1,600 aircraft have been delivered under annual contracts and two multiyear contracts covering fiscal years 1982-85 and 1986-89.

The Air Force is proposing a third multiyear contract for fiscal years 1990-93 with advance procurement funding in fiscal year 1989. It plans to procure 630 airframes and related equipment at an estimated cost of $4.3 billion. This represents a savings of $262 million (5.7 percent) compared to the Air Force's estimated costs of annual contracts covering the same period and quantity. The multiyear contract would be a sole-source, firm fixed-price contract. Air Force officials told us that a recent study concluded that dual sourcing the F-16 at the prime level was not feasible.

Although we cannot verify the total amount of savings, we consider the F-16 program office cost-estimating methods to be reasonable. The program office's contract cost estimates were largely based on the F-16's extensive production history. An independent cost analysis found a high degree of confidence in the methods and data used. The Air Force used current subcontractor pricing agreements to project savings from economic order quantity purchases, which is the largest category of

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[2]Economies Available by Converging Government Meteorological Satellites (GAO/NSIAD-87-107, April 1987).

savings. Our February 1986 report[3] confirmed the savings from subcontract purchase orders under the first multiyear contract.

The program office has been revising its estimates and now unofficially projects a total multiyear contract savings of $282 million. Although the estimated savings from a multiyear contract for F-16 are the largest of all the candidates in absolute dollars, as a percentage of total annual contract costs, the estimated savings are 5.7 percent (3.4 percent discounted). Annual and multiyear contract proposals are not expected to be received until July 1989, but the Air Force plans to release advance procurement funds by November 1988. Program officials believe that their experience on the two prior multiyear contracts has been good and that hundreds of millions of dollars have been saved.

IMAGING INFRARED MAVERICK MISSILE

The Imaging Infrared (IIR) Maverick is a rocket propelled, air-to-surface guided missile that develops tracking signals from the naturally occurring thermal energy of the target. The Maverick is a stand-off weapon that can be used in day, night, and in limited adverse weather against tanks and other battlefield hard targets. The IIR Maverick is produced in three models and is acquired by the Air Force and the Navy. The Air Force is the procuring agency.

The Air Force is proposing to buy 16,772 missiles (both Air Force and Navy requirements) using a multiyear contract covering fiscal years 1989-92. The Air Force estimates multiyear contract costs of about $1.7 billion and savings of $209.7 million (11 percent) compared to the estimated cost of annual procurements. The multiyear contract would be firm fixed-price and awarded on a competitive winner-take-all basis.

The Air Force originally estimated annual contract costs based on fiscal year 1985 and prior procurements. Following discussions with the contractors, the program office estimated that multiyear contracting could save about 10 percent in the areas of vendor procurement and manufacturing. The justification materials submitted to the Congress in January 1987 reflected these estimates.

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[3]An Assessment of the Air Force's F-16 Aircraft Multiyear Contract (GAO/NSIAD-86-38, February 1986).

After the budget submission, the Air Force negotiated fiscal years 1986 and 1987 procurements with the two approved contractors. The competition resulted in much lower unit prices than those used in preparing the fiscal year 1988-89 budget request. Consequently, the Air Force is re-estimating contract costs and budget requirements, both for the fiscal year 1988 annual requirement and for the proposed multiyear contract. Rather than reduce its total budget requirement, the program office is recommending that more missiles be procured. Program officials estimate that the Air Force could procure 2,300 additional missiles using the amount requested for the multiyear contract. This increased quantity does not include additional missiles that the Navy could procure with their proposed budget. We understand that the Navy is also proposing to increase the quantities purchased, but we could not determine the amount of the projected increase. Air Force officials told us that the revised justification materials may be available during September 1987.

Because of the successful use of competition, the Air Force is also considering continuing dual annual contract awards in fiscal year 1989. This would delay the proposed multiyear contract until fiscal year 1990 at the earliest. A winner-take-all multiyear contract ending in fiscal year 1992 would likely mean a sole-source situation for subsequent procurements planned through fiscal year 1997.

The IIR Maverick generally meets the stable requirement and design criteria, but funding stability is uncertain, given the program funding history which has been turbulent. The production schedule has stretched from 7 to 16 years, in part, because of several budget reductions by DOD and the Congress. The House Armed Services Committee has recommended reductions in both the Air Force and Navy fiscal year 1988 budget requests.

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