United States General Accounting Office

GAO

Briefing Report to Congressional Requesters

January 1991

NAVY BUDGET

Potential Reductions in Weapons Procurement

GAO/NSIAD-91-22BR

GAO

United States
General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-241277

January 18, 1991

The Honorable Daniel K. Inouye
Chairman, Subcommittee on Defense
Committee on Appropriations
United States Senate

The Honorable John P. Murtha
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

As requested, we reviewed the Navy's justification for its fiscal year 1991 Weapons Procurement budget request and prior year appropriations to identify areas for potential reductions and rescissions. Specifically, we found reductions for the following six weapon and ordnance systems: Trident II (D-5) missile, Tomahawk cruise missile, High Speed Anti-Radiation Missile (HARM), MK-48 advanced capability (ADCAP) torpedo, MK-50 advanced lightweight torpedo (ALWT), and 16-inch gun ammunition. (See app. I.) Although no reductions are involved, we also reviewed the following five other weapon systems to report on timely programmatic issues: Phoenix missile, Standard Missile (SM), Rolling Airframe Missile (RAM), Penguin missile, and Vertical Launched Anti-Submarine (VLA) rocket. (See app. II.) In addition, we identified prior year funds that were no longer needed for purposes specified in the selected weapons procurement programs. (See app. III.)

In July and August 1990, we presented the preliminary results of our analysis to your offices. This report summarizes and updates the information provided in those briefings.

Results in Brief

We identified $389.3 million in potential reductions to the fiscal year 1991 budget request and $25.7 million in potential rescissions from appropriated funds for fiscal year 1990. Table 1 shows these potential reductions and rescissions by program. Details regarding the potential reductions, rescissions, and other program issues are provided in appendixes I and II.

As requested, we did not obtain written agency comments on this report. However, we discussed the contents of this report with officials from OSD and the Navy and have incorporated their comments where appropriate. The officials generally agreed with the factual material presented in this report, but they disagreed with any funding reductions, rescissions, or obligational restrictions.

We are sending copies of this report to the Secretaries of Defense, the Navy, and the Air Force and other interested parties.

This report was prepared under the direction of Martin M Ferber, Director, Navy Issues, who may be reached on (202) 275-6504 if you or your staff have any questions. Major contributors to this report are listed in appendix IV.

Frank C. Conahan
Assistant Comptroller General

the need to procure at equal to or very close to the missile's maximum production capability. Program office officials said that if the Navy reduced its planned procurement by six missiles, there would be no unit cost contract pricing penalties, but that any reduction greater than six would incur pricing penalties. We found that costs for the United States and the United Kingdom under their cost-sharing arrangement would not increase if the planned procurement was reduced by six missiles.

If the Navy limits the Trident II submarine force to 18, as advocated by some Members of Congress, or alters its current procurement strategy of 1 submarine a year in fiscal year 1991, the missile budgetary impact would not be felt until fiscal year 1995. That is when the missiles required to support the 18th submarine with a projected delivery date in fiscal year 1997 are needed.

Status of Unobligated Funds

Table I.1 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the Trident II missile.

Table I.1: Trident II (D-5) Missile's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 7/27/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$1,343 8	$1,223.0	$1,637 5	$1,731 3
Amount obligated	0	(738.4)	(1,538 6)	(1,709 5)
Advanced procurement	192 6	216 1	228 1	310 0
Amount obligated	0	(140 0)	(225 6)	(309 0)
Spares				
Initial	1 6	4 5	5.6	4 8
Replenishment	0	0 5	0 7	0 7
Amount obligated	0	(3 0)	(6 2)	(5 5)
Total	**$1,538.0**	**$562.7**	**$101.5**	**$22.8**

Tomahawk Cruise Missile

Brief Description

The Tomahawk cruise missile weapons system is a family of long-range, subsonic missiles. These missiles consist of both conventionally armed or

next-generation cruise missile, the Long-Range Conventional Standoff Weapon (LRCSW).

Given the Navy's recent decision to extend Tomahawk production beyond fiscal year 1992, the proposed additional fiscal year 1991 incremental buy of 200 missiles over the original 400 planned to achieve greater cost savings is essentially negated.

Navy officials also told us that several companies are doing competitive LRCSW concept definition studies. Under current plans, a 4-year demonstration/validation phase would begin simultaneously as the Navy ordered its last Tomahawk missiles, and the Tomahawk missiles would have been out of production by the time LRCSW was ready for 4 years of full-scale development. If the Navy wanted to evaluate a new round of Tomahawk upgrades (a possible Block IV) against LRCSW, it would have to choose between these concepts well before the end of LRCSW demonstrations or accept increased costs in a Tomahawk restart. However, with the proposed stretch-out, Navy officials say work would continue through the completion of LRCSW demonstrations. They also indicated that the proposed combination of new production and Block III upgrade remanufacturing through fiscal year 1995 would be enough to sustain both General Dynamics and McDonnell Douglas.

Status of Unobligated Funds

Table I.2 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the Tomahawk missile.

Table I.2: Tomahawk Cruise Missile's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/29/90)

Dollars in millions

	Fiscal Year			
	1991	**1990**	**1989**	**1988**
Procurement	$808.7	$575.3	$599.6	$754 3
Amount obligated	0	(522.3)	(587.6)	(750.1)
Advanced procurement	0	0	75 6	71.4
Amount obligated	0	0	(75.6)	(71 4)
Spares				
Initial	28.1	30.7	20.8	22. 5
Amount obligated	0	(15.5)	(20 1)	(22.5)
Total	**$836.8**	**$68.2**	**$12.7**	**$4.2**

Table I.3: HARM's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/29/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$339 4	$305 5	$295.9	$186.1
Amount obligated	0	(276.8)	(290.5)	(186 1)
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	1.6	4.5	4 2	9.0
Amount obligated	0	(3 9)	(4.0)	(8.8)
Total	**$341.0**	**$29.3**	**$5.6**	**$0.2**

MK-48 Advanced Capability Torpedo

Brief Description

The MK-48 advanced capability (ADCAP) torpedo was developed as an improvement to the MK-48 torpedo to counter enemy submarine threats through the 1990s. The MK-48 ADCAP includes improvements in the guidance and control systems and in the propulsion system, which will allow it to go faster, deeper, and farther than the current MK-48. The MK-48 ADCAP torpedo program is in full production, having passed that decision point in February 1989.

Under the fiscal year 1990 program, 260 ADCAP torpedoes will be purchased for $437.8 million through dual-source competition involving Hughes Undersea Weapons Division and Westinghouse Naval Systems Division. The fiscal year 1991 request provides for the procurement of 240 torpedoes for $350.3 million in an economic winner-take-all competition between the current dual-source manufacturers.

Results of Analysis

The Navy requested $350.3 million for fiscal year 1991 to procure 240 MK-48 ADCAP torpedoes. If the actual contract cost of the MK-48 torpedoes is less than the funds appropriated, as happened last year, the request could be reduced by $19.7 million. In addition, $21.4 million in fiscal year 1990 appropriated funds could be rescinded because that amount represents the reserve for engineering change proposals that have not yet been used.

The technical evaluation for the MK-50 has been completed and the operational evaluation, which began in July 1990, will continue through early 1991. The full-rate production decision is scheduled for April 1991.

Results of Analysis

The Navy requested $328.3 million for fiscal year 1991 to procure 265 MK-50 torpedoes. If the actual contract cost of the MK-50 torpedoes is less than the funds appropriated, as happened last year, the request could be reduced by $5.2 million. Last year, the actual contract costs for the MK-50 torpedoes were $4.3 million less than the funds appropriated, so $4.3 million could be rescinded from the Navy's fiscal year 1990 weapons procurement. We have previously reported that the operational testing and evaluation of the MK-50 torpedo was not realistic, testing resources were inadequate, and the live fire test and evaluation did not comply with requirements. These problems have not been resolved.

We believe the procurement of MK-50 torpedoes should be limited to the rate of procurement in fiscal year 1990 until these problems are solved. Therefore, a $44.1-million reduction can be made to the fiscal year 1991 request if the purchase of the MK-50 torpedoes is reduced from 265 to 200 torpedoes, which would continue the fiscal year 1990 levels.

Status of Unobligated Funds

Table I.5 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the MK-50 ALWT torpedo.

Table I.5: MK-50 ALWT's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$328.3	$270 8	$159 9	$74 7
Amount obligated	0	(257 5)	(159 9)	(73 6)
Advanced procurement	0	0	36 5	33 7
Amount obligated	0	0	(32 5)	(33.7)
Spares				
Initial	5 2	3.2	4 2	8 0
Amount obligated	0	(3 2)	(4.2)	(7 9)
Total	**$333.5**	**$13.3**	**$4.0**	**$1.2**

Table I.6: 16-Inch Gun Ammunition's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$33.0	$26.3	$9.2	$13.8
Amount obligated	0[a]	(24.9)[b]	(9.2)[b]	(13.0)[b]
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	0	0	0	0
Amount obligated	0	0	0	0
Total	**$33.0**	**$1.4**	**$0**	**$0.8**

[a]Weapons procurement, Navy

[b]Other procurement, Navy

(DOD believes its projected Phoenix inventory level and the associated risk involved in early termination is acceptable.) In addition, proponents expect progress on the follow-on AAAM to be delayed with its entry into the fleet not expected until the year 2000 at the earliest. (DOD has looked into the possibility of accelerating the program, but has found no way of doing so without unacceptable risk.)

If the Navy terminates the Phoenix program as anticipated, Navy officials estimate that its associated weapons procurement production line shutdown of related costs, assuming no restart, would be about $8 million in fiscal year 1992 funds. A Navy study is being done to more closely estimate the costs.

Also, if a decision was made to bring the Phoenix back into production in fiscal year 1991, rather than to stretch out the fiscal year 1990 procurement buy, there would be start-up costs associated with some suppliers and restarting the production line. Specifically, the current fiscal year 1990 award will keep the prime contractor (Hughes) in production through fiscal year 1992. The last contract awarded to the dual-source contractor (Raytheon) was in fiscal year 1989 and will keep them in production through fiscal year 1991 and possibly into fiscal year 1992, thus allowing them to remain competitive to bid in fiscal year 1991. Due to vendor recall/reestablishment for long-lead items, there is also a restart cost estimated at $4.3 million if funds are available at the beginning of fiscal year 1991, increasing to $15 million by the end of fiscal year 1991. Shutdown with restart after fiscal year 1992 is estimated to cost as much as $100 million in nonrecurring costs.

Status of Unobligated Funds

Table II.1 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the Phoenix missile program.

percent and 60 percent of the yearly builds in 1988 and 1989, respectively.

The SM-2 hardware budgeted in fiscal year 1989 was for 1,310 missiles. Navy's initial follow-on fiscal year 1990 estimate was for only 590 Aegis and Terrier medium-range missiles reflecting in-house budget constraints. To meet minimum sustaining rates for the two producers, the Navy planned to restructure its fiscal years 1989 and 1990 deliveries to reflect a 950 annual sustaining rate (i.e., 1,310 fiscal year 1989 deliveries stretched over 16 months while competing the estimated fiscal year 1990 buy of 590 over 8 months, or a total of 1,900 over 24 months). The Appropriations Committee conferees agreed to sustain the two producers under a similar fiscal year 1989/1990 procurement strategy, but also increased the quantity in fiscal year 1990 by 350, to 940, thereby completing the Terrier ship requirements.

Results of Analysis

The fiscal year 1991 request provides for procurement of 600 SM-2 medium-range missiles for Aegis ships and the initial pilot production buy of 300 Aegis extended range missiles (900 in total).

With funding levels being reduced based on revised worldwide threat and procurement of SMs dropping in recent years, there may be a need to continue dual sourcing for SM. According to OSD officials, the SM improvement program that incorporates Block III and IV variants and promotes dual source procurement may no longer appear cost-effective. However, program office officials added that there would be significant costs involved in disengaging from dual-source procurement for completing the remaining Block III and IV variant requirements—more costs than with just maintaining the present procurement strategy. Further, program office officials state that current threats from Third World countries may argue against any program funding reductions. Also, as a result of related tactical missile requirements work[1] and our current budget analysis work, we identified weaknesses in the Navy's ability to adequately plan requirements with the new SM-2 Block IV (Aegis extended range) missile, scheduled for production in 1993. No operational requirement, decision coordination paper, nor test and evaluation master plan has been approved by OSD for this development effort. Navy officials view this as an upgrade, not a new development effort requiring such documentation, although they have provided a draft

[1]Tactical Missiles: Issues Concerning the Navy's Requirements Determination Process (GAO/NSIAD-90-233, Sept. 12, 1990)

Rolling Airframe Missile

Brief Description

The 5-inch diameter, surface-to-air Rolling Airframe Missile (RAM) and its launching system is a cooperative program, with the United States and the Federal Republic of Germany (FRG) sharing the costs and FRG providing a second source for missile acquisition. RAM is a high firepower self-defense system used against anti-ship capable missiles. The system is planned for installation on certain amphibious ships and is being considered for frigates, destroyers, aircraft carriers, and support ships.

RAM, which began advance development in 1976, is concurrently in full-scale engineering development and low-rate initial production. A full-rate production decision is planned for December 1990. RAM completed technical evaluation in December 1989 and recently finished conducting the final phase of its operational test and evaluation.

In October 1989, the U.S. Navy finalized the low-rate initial production contract that combined fiscal years 1988 (240) and 1989 (260) quantities into a single buy for 500 missiles with the American producer (General Dynamics/Valley Systems Division in Rancho Cucamonga, California). In November 1989, reimbursable program requirement contracts (outside the direct Weapons Procurement, Navy program funding) were awarded to the German second-source consortium (RAM Systems in Ottobrunn, Germany) for assembly line setup and low-rate initial production of 350 missiles. After approving full-rate production, the Navy planned for the two sources to compete for the combined United States and German fiscal year 1990 requirement of 980 missiles.

Results of Analysis

The fiscal year 1991 procurement funding request provides for fabricating 405 missiles to be competitively procured from the two sources. (In the early stages of the fiscal year 1991 budget preparation, the Navy planned to request procure 540 missiles to be compatible with its fiscal year 1990 (580) authorization, but reduced the quantity by 135 to 405 due to known production delivery slippages.)

The RAM program experienced significant cost increases and schedule delays in the early stages of the program. The capability of the missile,

Table II.3: RAM's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$70.4	$90.2[a]	$55.9	$44.9
Amount obligated	0	(3.7)	(55.9)	(44.9)
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	0.7	0.9	1.0	0
Amount obligated	0	0	(0.9)	0
Total	**$71.1**	**$87.4**	**$0.1**	**$0**

[a]$85.1 million withheld by OSD pending FRG decision in late 1990

Penguin Missile

Brief Description

The Penguin is a short-range, air-to-surface infrared guided missile acquired to provide an attack capability to enhance the effectiveness of the LAMPS MK-III helicopter in its anti-surface warfare mission. The MK-2 Mod 7 Penguin is being developed jointly by the United States and Norway under a Memorandum of Understanding between DOD and the Norwegian Ministry of Defense. (The MK-2 Mod 7 Penguin missile is a modified Norwegian surface launched MK-2 Mod 3 missile.)

The program schedule reflects development and operational testing from July 1988 through August 1990 with a low-rate initial production decision in 1990. The fiscal year 1990 budget of $62.6 million provided for the first procurement of 64 missiles and advance procurement of $3.7 million to support fiscal year 1992. The fiscal year 1991 budget request of $44.2 million provides for the procurement of 65 Penguin missiles.

Results of Analysis

As a result of a Navy program meeting decision on July 31, 1990, the Penguin program has been drastically altered. The Navy's low-rate initial production plans are now only to procure 24 of the appropriated 64 fiscal year 1990 missiles with options for an additional 40 and 42 missiles in fiscal years 1991 and 1992, respectively. The fiscal year 1991 budget request of $44.2 million for the lower number of missiles (40

The missile is powered by a solid propellant rocket motor and delivers a MK-46 Mod 5 torpedo as its payload. It is designed to provide an intermediate range, all weather, quick reaction ASW capability to the ships that will carry it. No funding was requested or received for the VLA program in fiscal year 1990.

Results of Analysis

No funds were requested for the VLA program in fiscal year 1991. The VLA program's future depends on the results of the current operational evaluations. (Results are expected in late 1990.) If VLA fails its test, the fiscal year 1989 funding of $98.4 million may not be released and could be subject to congressional rescission. These funds are being held by the DOD Comptroller, pending the results of the operational evaluation.

One problem with the VLA system is that its payload is the older MK-46 torpedo that was designed to counter the Soviet submarine threat of the 1980s and into the 1990 era. A DOD expert stated that VLA would be a better weapon if procurement was delayed until a newer MK-50 torpedo was available with the improved warhead as the payload.

The VLA program is also competing for funding with the Sea Lance long-range ASW system. The Secretary of the Navy canceled the Sea Lance program last year. However, both the Senate and House Armed Services Committees recommended authorizing funds for the Sea Lance in fiscal year 1991. Sea Lance is also a guided rocket but it carries the MK-50 torpedo as a payload.

Status of Unobligated Funds

Table II.5 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1989-90, for the VLA program

Weapons Procurement, Navy Funds Potentially Available for Rescission—Currently Held in OSD and the Department of the Navy (As of 9/29/90)

Dollars in millions

Fiscal year 1990 program activity	OSD	NAVY	OSD/Navy explanatory notes
Advanced Medium Range Air-to Air Missile	$53 3	$0	Pending Defense Acquisition Board review for production approval (April 1991) Proceeding at OSD's direction on an interim basis
RAM	85 1	0	Pending approval for full production.
Penguin	18 3	0	Pending the forwarding of OSD's "go" production approval decision to the Congress to complete the final incremental buy (16) of a 24 (versus planned 64) missile fiscal year 1990 program
Tactical Air Launched Decoy	0	9.0	Pending review of requirements
SM modifications	0	3 0	Exceeding requirements, pending Navy reprogramming actions (Penguin).
Sea Lance	1 8	0	Program canceled, pending review of requirements.
Phalanx Close-in-Weapon System modifications	0	1 7	Exceeding requirements, pending Navy reprogramming action (Penguin)
Spares & repair parts	12 8	0	Exceeding requirements, pending reprogramming action
Maverick	0	4.5	Exceeding requirements, pending Navy reprogramming action.
Subtotal	**171.3**	**18.2**	
Fiscal year 1989 program activity			
Sparrow	2 6	0	Pending review of requirements
VLA	98 4	0	Pending operation evaluation completion
Subtotal	**101.0**	**0**	
Fiscal year 1988 program activity			
Subtotal	**0**	**0**	
Total all 3 fiscal years	**$272.3**	**$18.2**	

Requests for copies of GAO reports should be sent to:

U.S. General Accounting Office
Post Office Box 6015
Gaithersburg, Maryland 20877

Telephone 202-275-6241

The first five copies of each report are free. Additional copies are $2.00 each.

There is a 25% discount on orders for 100 or more copies mailed to a single address.

Orders must be prepaid by cash or by check or money order made

Major Contributors to This Report

National Security and International Affairs Division, Washington, D.C.

Brad Hathaway, Associate Director
John J. D'Esopo, Assistant Director
Joseph J. Faley, Evaluator-in-Charge
Dale O. Wineholt, Evaluator

Table II.5: VLA's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds
(As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$0	$0	$104.4	$0
Amount obligated	0	0	(3.7)	0
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	0	0	4.9	0 4
Amount obligated	0	0	(4.9)	(0.4)
Total	**$0**	**$0**	**$100.7**	**$0**

versus the planned 65) remains the same. Also, the overall planned missile inventory has been reduced from 193 to 106 missiles.

According to Navy program office officials, from a programmatic view, several factors led to the reduced quantity of missiles resulting in a much higher per unit cost. These factors included delays in developmental testing, only one missile type (MK-2 Mod 7) on the production line (previous plans also called for joint production with the MK-3 Air Force missile that is now out of production), and the effects of the increasing value of the Norwegian kroner in relation to the U.S. dollar in contract negotiations. However, from a fleet impact view, Navy officials contend that the lower inventory quantity of missiles will not affect its intended mission, which is to mobilize for a low intensity conflict where tactical aircraft are not available.

Status of Unobligated Funds

Table II.4 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1989-90, for the Penguin missile.

Table II.4: Penguin Missile's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/29/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$44 2	$62.6[a]	$0	$0
Amount obligated	0	(2 9)	(0)	(0)
Advanced procurement	0	3.7	3 5	3.5
Amount obligated	0	0	(3.5)	(3.5)
Spares				
Initial	3.6	0	0	0
Amount obligated	0	0	0	0
Total	**$44.8**	**$63.4**	**$0**	**$0**

[a]Includes $18 3 million being withheld by OSD pending requirements review

Vertical Launched Anti-Submarine

Brief Description

VLA is an ASW missile launched from surface combatant ships such as the DD-963 or CG-47, which are equipped with the vertical launch system.

as it is now configured, will not be fully known at the full-rate production milestone in 1990 because of test limitations. Further, major improvements to the missile will be needed to meet the emerging anti-ship cruise missile threat. In an August 1990 report[2] of our joint German Federal Court of Audit Review, we discussed these and other problems and provided solutions that are summarized below.

The basic RAM, as currently designed, will have increasing difficulties in engaging a major portion of the threat in various regions of the world. Numerous test limitations will prevent a full assessment of the system's capability before the upcoming FRG milestone in 1990. In addition, the number of basic RAMs needed by the U.S. and German navies is substantially less than the planned procurement. Also, the RAM program has experienced significant cost growth throughout development. The decision to establish a second German source for RAM production will probably not meet the objective of reducing overall costs.

Accordingly, our August 1990 RAM report work recommended directing the Navy to postpone the FRG decision until the operational capabilities of the basic RAM have been fully evaluated, the actual costs of producing the initial 850 missiles are known, and the feasibility of upgrading RAM to counter the emerging anti-ship missile threat has been determined. We also recommended combining production quantities authorized in fiscal years 1990 and 1991 to achieve greater economics of scale.

Status of Unobligated Funds

Table II.3 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for RAM.

[2]Navy Ship Defense: Concerns About the Strategy for Procuring the Rolling Airframe Missile (GAO/NSIAD-90-208, Aug. 27, 1990).

decision coordination paper and test and evaluation master plan to the Assistant Secretary of the Navy for approval. However, the General Dynamics contractor differs and indicates that the missile variant is over 60 percent new and, in many ways, a major development effort.

Also, we were initially told that the Navy might forego a series of operational tests normally done in a realistic operational environment that would demonstrate the combat effectiveness and suitability of the Aegis extended range and resolve technical uncertainties and problems before entering full-rate production. However, program officials recently told us that they plan to conduct operational tests and evaluation before entering into the full-rate production phase.

The Navy, General Dynamics, and Raytheon all acknowledge technical problems with a design feature (e.g., target detection device fuze) in the Block IIIA and IV program requiring at least a 2-month slippage in the Aegis extended range initial operating capability date. Although Navy officials believe a "technical solution" has been found for this major redesign effort, further scheduling delays may be encountered. Currently, the Navy views its SM-2 improvement program, including the Aegis extended-range pilot production delivery schedule, as aggressive but achievable.

Status of Unobligated Funds

Table II.2 shows the funds requested for fiscal year 1991 and the status of the funds appropriated, but not yet obligated during fiscal years 1988-90, for the SM improvement program.

Table II.2: SM's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$607.8[a]	$390 2	$594 6	$561.3
Amount obligated	0	(83 6)	(536 3)	(549 2)
Advanced procurement	0	0	0	0
Amount Obligated	0	0	0	0
Spares				
Initial	6.0	4 4	2.0	8 3
Replenishment	0 1	7 1	5 6	14 4
Amount obligated	0	(6 7)	(7 4)	(22.7)
Total	**$613.9**	**$311.4**	**$58.5**	**$12.1**

[a]Includes hardware costs of $273 5 million for 300 Aegis extended range pilot production missiles (excludes about $362 6 million in related RDT&E pilot production efforts)

Table II.1: Phoenix Missile's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/29/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$0	$325.5	$393.0	$341.6
Amount obligated	0	(265.8)	(385.4)	(341.4)
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	0	2.2	0	1.0
Amount obligated	0	(1.4)	0	(1.0)
Total	**$0**	**$60.5**	**$7.6**	**$0.2**

Standard Missile

Brief Description

The Standard Missile (SM) is a family of medium- and extended-range surface-to-air missiles designed to protect the Navy fleet by intercepting anti-ship missiles and enemy aircraft in the outer battle area. It is the primary air defense missile employed on the Aegis and Tarter/Terrier New Threat Upgrade weapon systems. Over the years, overall performance has continually been improved through block changes.

Procurement of the SM-1 was completed in fiscal year 1985. SM-2 is designed for Aegis and Tartar/Terrier New Threat Upgrade ships and is an evolution of the SM-1 incorporating various design improvements. SM is now produced in four versions. The final orders for SM-2 Block II medium range and extended range were placed in fiscal year 1988. SM-2 Block III (Aegis variant) entered production in fiscal year 1988, while the Block III medium-ange (Tartar) and extended-range (Terrier) variants entered production in fiscal year 1989.

Since January 1988, General Dynamics (incumbent contractor) and Raytheon (second source) have been engaged in head-to-head (dual sourcing) competition for SM-2 components. Raytheon was selected in July 1987 for a research, development, test, and evaluation (RDT&E) contract to design the next generation of SMS—the Aegis extended range SM-2 Block IV. The new missile's extended range for countering targets at extremely high attitudes and crossing angles will depend on an additional solid-propellant booster. The two contractors are currently coproducers of the SM-2 Block II/III missiles, with Raytheon winning 40

Other Program Issues

We reviewed several Navy weapons procurement systems where no identifiable reductions or rescissions are involved, but where significant programmatic issues are present.

The following sections give a brief description of the weapons systems we reviewed and the results of our analysis of each system.

Phoenix Missile

Brief Description

The Phoenix missile system is comprised of a long-range airborne weapon control system with multiple target handling capabilities and long-range air-to-air missiles using semi-active, mid-course, and active terminal guidance. Its mission is to kill multiple air targets with conventional warheads. Competitive procurement began in fiscal year 1989 between Hughes Aircraft and Raytheon Company.

Results of Analysis

The fiscal year 1990 program was to be the final procurement of the Phoenix missile for the Navy. According to the Secretary of Defense, many factors were considered in deciding to terminate Phoenix, including the possibility of using other missiles, the changing world situation, current missile stock levels, possible changes in requirements, and the need to fund the Advanced Air-to-Air Missile (AAAM) development program—the Navy's next-generation long-range air superiority missile.

DOD did not request any Phoenix missile funds for fiscal year 1991. However, congressional efforts are currently underway for adding funds to the fiscal year 1991 budget request for stretching out production of the fiscal year 1990 final buy of 420 Phoenix missiles into fiscal year 1991. This would accommodate integration of an already developed upgrade (AIM-54C) into those missiles. The upgrade provides improved lethality, electronic counter-measure performance, high and low altitude performance, etc. Program proponents said such a retrofit program will preserve key elements of the industrial base and guard against further delays in the follow-on system.

Supporters of the proposal cite the Navy's inventory shortfall of Phoenix missiles with no suitable substitutes—citing inadequate long-range requirement capabilities for any likely candidates, such as the AIM-9 Sidewinder air-to-air and AIM-7 Sea Sparrow anti-air missiles.

16-Inch Gun Ammunition

Brief Description

This program procures rounds of ammunition that can be fired from Iowa class battleships against surface and shore targets. The requirement is based on 36 barrels installed on 4 ships in the active fleet as well as barrels located at engineering test sites. The funds requested are required to procure components, load and assemble complete rounds, and to conduct acceptance tests on the ammunition. The ammunition will be used for training, resupply of reserve quantities, specific combat reserve quantities, and inter-theater shipping loss replacements.

No future procurement of this ammunition is planned.

Results of Analysis

We have identified a potential reduction of the $33 million requested in fiscal year 1991 for 16-inch gun ammunition. The Secretary of Defense has announced that two of the Iowa class battleships will soon be retired, and we have testified before the Senate Committee on Armed Services[2] that "the two remaining battleships seem to be top candidates for decommissioning." These changes make the Navy's requirements analysis outdated since it was based on four active duty battleships. Additional information and analysis are provided in our Department of Defense (DOD) ammunition budget work.[3] Navy officials stated that this was the last scheduled buy of this ammunition, and it would have to last for the life of the battleships.

Before submitting the fiscal year 1991 budget request, this ammunition was procured using funds appropriated under the other procurement, Navy account for fiscal years 1988-90. A total of $2.2 million remains unobligated and could be rescinded.

Status of Unobligated Funds

Table I.6 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the 16-Inch Gun Ammunition program.

[2]Battleships, Issues Arising from the Explosion Aboard the U. S. S. Iowa (GAO/T-NSIAD-90-46, May 25, 1990).

[3]Defense Budget: Potential Reductions to DOD's Ammunition Budgets (GAO/NSIAD-90-256, Sept. 17, 1990).

We previously reported on the MK-48 ADCAP system's shortcomings, and believe further development and testing is required before production rates are increased. The Director of Live Fire Testing in the Office of the Secretary of Defense (OSD) also reported similar shortcomings with the system.[1] Since these problems have not been resolved, we believe that the Navy is purchasing large quantities of torpedoes that have not been adequately or realistically tested and that the MK-48 ADCAP should be produced at the minimum rate required to maintain production lines.

Status of Unobligated Funds

Table I.4 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the MK-48 ADCAP torpedo.

Table I.4: MK-48 ADCAP Torpedo's Fiscal Year 1991 Budget Request and Fiscal Years 1990, 1989, and 1988 Unobligated Funds (As of 8/30/90)

Dollars in millions

	Fiscal year			
	1991	**1990**	**1989**	**1988**
Procurement	$350.3	$437 8	$481 1	$243.4
Amount obligated	0	(409.3)	(461 4)	(237 2)
Advanced procurement	0	0	0	0
Amount obligated	0	0	0	0
Spares				
Initial	5 4	4 7	9 7	12.3
Amount obligated	0	(4 7)	(9.7)	(12.3)
Total	**$355.7**	**$28.5**	**$19.7**	**$6.2**

MK-50 Advanced Lightweight Torpedo

Brief Description

The MK-50 advanced lightweight torpedo (ALWT) is the successor to the MK-46 lightweight torpedo. The MK-50 is an acoustic homing torpedo that can be employed from fixed-wing anti-submarine warfare (ASW) aircraft, ASW helicopters, and surface ships equipped with either torpedo tubes or Vertical Launched Anti-Submarine (VLA) Rockets.

[1] Assessment of Navy Live Fire Test and Evaluation of the MK-48 ADCAP Torpedo Program, Director, Live Fire Testing, Office of the Under Secretary of Defense (Acquisition), Dec. 20, 1988.

High Speed Anti-Radiation Missile

Brief Description

The High Speed Anti-Radiation Missile (HARM) is a joint Navy and Air Force air-to-surface missile designed to suppress or destroy land-based and sea-based radars supporting enemy air defense systems. HARM evolved from anti-radiation missiles such as the Shrike and the Standard Anti-Radiation Missile and is replacing both of those missiles in the Navy inventory. The Navy is acting as the lead contracting office for both Navy and Air Force procurement of HARM.

Texas Instruments has produced HARM since fiscal year 1981. It currently delivers 200 missiles a month. A second source for HARM has been created with the production of the low cost seeker model, developed by the Naval Weapons Center, China Lake, California, and produced by Ford Aerospace.

Results of Analysis

The Navy requested $339.4 million for fiscal year 1991 to procure all models of the HARM. About $27.4 million of that request is intended to procure 120 of the HARMs with the low cost seeker guidance sections from Ford Aerospace. The Air Force has also requested $27.4 million in its Missile Procurement, Air Force Account for 120 of the low cost seeker HARM models. The Navy and the Air Force budget requests can each be reduced by $27.4 million because Ford Aerospace has not been able to produce the low cost seeker model on schedule. For example, Ford Aerospace missed its fiscal year 1990 delivery dates for preproduction missiles. Since those missiles were late, the Navy did not have time to perform the required tests and award a contract for the fiscal year 1991 production of the low cost seeker HARM model.

The Navy is acting as the lead contracting office for both Navy and Air Force Procurement of the HARM, so neither service will be procuring the low cost seeker model in fiscal year 1991.

Status of Unobligated Funds

Table I.3 shows the funds requested for fiscal year 1991 and the status of funds appropriated, but not yet obligated during fiscal years 1988-90, for the HARM.

nuclear land attack and conventionally armed anti-ship surface versions that are used against targets at sea or on land. Tomahawk can be launched from aircraft, ships, submarines, and ground launchers. The missile is designed to be deployed on submarines and surface ships from a variety of strike launchers. At the end of 1989, 35 surface ships and 46 submarines were capable of carrying Tomahawk missiles. The missiles are dual-sourced on a competitive basis from General Dynamics, Convair Division of San Diego, California, and McDonnell Douglas Missile Systems Company of St. Louis, Missouri. An upgrade configuration improvement, called Block III, which includes a smaller, safer warhead, and other advancements, will enter limited production (24 units) in fiscal year 1991. Missiles with these upgrades are scheduled to be operational on surface ships in 1993 and on submarines in 1995.

Results of Analysis

The Navy requested $808.7 million for fiscal year 1991 to procure 600 Tomahawk missiles. The request could be reduced by $146.4 million. According to program office officials, this represents the approximate dollar amount added to the fiscal year 1991 budget request for procuring 200 missiles more than in the prior year.

Under the submitted fiscal year 1991 budget request, the Navy planned to end production of all types of Tomahawk cruise missiles by ceasing production 2 years early. Under previous plans, 400 Tomahawks a year were to be built until fiscal year 1994 when a total of about 4,000 was to be achieved. The fiscal year 1991 budget request, however, shortened the Navy's buildup of Tomahawk cruise missiles by increasing the yearly buildup during fiscal years 1991 and 1992 from 400 to 600 missiles, with none being built thereafter. The total planned buildup of the missile inventory was reduced by 400. The decision was motivated by the Navy's desire to capture substantial savings from the most efficient production rate under the dual-source competition.

The Navy decided to extend Tomahawk production beyond fiscal year 1992 to meet previous inventory goals. It now plans to stretch out the Tomahawk production and restore missile quantities (about 400) to reach the originally planned 4,000-missile inventory goal. The new plan calls for 600 missiles in fiscal year 1991 and for extending production for new and remanufactured Block III configuration missiles through fiscal year 1995. This plan would sustain the dual-source competition. It would also keep manufacturers and their subcontractors and suppliers available longer for a Tomahawk-based alternative to the prospective

Potential Reductions and Rescissions to Navy Weapons Procurement Budgets

We identified potential reductions and rescissions of $415 million from the Navy's weapons procurement budgets: reductions of $389.3 million in the fiscal year 1991 budget request and rescissions of $25.7 million in appropriated funds for fiscal year 1990.

The following sections briefly describe the weapon systems we reviewed and the results of our analysis of each system.

Trident II (D-5) Missile

Brief Description

The Trident II (D-5) is a three-stage, solid propellant, inertially guided fleet ballistic missile. Its missiles are launched underwater from the Ohio class of nuclear propelled Trident submarines, each of which has 24 launch tubes. Trident II has been in full-scale engineering development since October 1983 and attained initial operational capability in March 1990. The United Kingdom is a participant in the development of this missile.

Results of Analysis

The Navy requested $1,343.8 million for fiscal year 1991 to procure 52 missiles. The fiscal year 1991 budget request helps fund a Trident II missile procurement program that will support 17 Ohio class Trident submarines and related evaluation test programs. The Navy eventually plans to request funding for at least 21 Ohio class submarines and is currently building 1 submarine a year, each carrying 24 8-warhead Trident II missiles.

We compared the total requirements for Trident II missiles with planned procurements through the fiscal year 1991 delivery period and found that the Trident II missile inventory exceeded requirements by at least six missiles. Therefore, the request could be reduced by about $113.5 million, which is the cost of six missiles at about $18.9 million per missile.

While agreeing that the available inventory may appear excessive, Navy officials asserted that this is not the case and that there is little flexibility to defer near-term procurements to subsequent fiscal years. They stated that the Navy's current Trident II missile procurement profile through the fiscal year 1991 delivery period must consider planned procurements for both the United States and the United Kingdom and

Abbreviations

AAAM	Advanced Air-to-Air Missile
ASW	Anti-Submarine Warfare
ADCAP	advanced capability
ALWT	advanced lightweight torpedo
DOD	Department of Defense
FRG	Federal Republic of Germany
HARM	High Speed Anti-Radiation Missile
LRCSW	Long-Range Conventional Standoff Weapon
OSD	Office of the Secretary of Defense
RAM	Rolling Airframe Missile
RDT&E	research, development, test, and evaluation
SM	Standard Missile
VLA	Vertical Launched Anti-Submarine

Contents

Table 1: Potential Reductions and Rescissions to Navy Weapon Procurement Budgets

Dollars in millions

Program	Fiscal year 1991	1990	Total
Trident II	$113 5	$0	**$113.5**
Tomahawk	146 4	0	**146.4**
HARM	27.4	0	**27.4**
MK-48 ADCAP	19 7	21.4	**41.1**
MK-50 ALWT	49.3	4.3	**53.6**
16-inch gun ammunition	33 0	0	**33.0**
Total	**$389.3**	**$25.7**	**$415.0**

We also identified a potential reduction of $27.4 million to the Air Force's missile procurement fiscal year 1991 budget request for HARM, and a potential rescission of $2.2 million from the Navy's other procurement appropriated funds for fiscal years 1990 and 1988 for 16-inch gun ammunition. These reductions and rescissions result primarily from contract production and delivery problems and testing slippages and deficiencies for the various weapons programs.

In addition, we identified $290.5 million of fiscal years 1988 to 1990 funds that were no longer needed for purposes specified in the selected weapons procurement activities. These funds are being held in reserve by the Office of the Secretary of Defense (OSD) and the Navy Comptroller, pending allocation, reprogramming, or transfer, as described in appendix III.

Scope and Methodology

We conducted our work at OSD and the Department of the Navy, Arlington, Virginia. We interviewed budget and program officials and reviewed pertinent program documents and budget support data obtained from OSD and Navy program offices.

We analyzed data relating to actual contract costs, requirements, contract delays, and program status. In some cases, we relied on the information supplied by program officials. We did not conduct a detailed review of each program's requirements.

We performed our review from March to August 1990 in accordance with generally accepted government auditing standards.