BY THE COMPTROLLER GENERAL

Report To The Chairman, Subcommittee On Defense, Committee On Appropriations, House Of Representatives

OF THE UNITED STATES

Recommended Reductions To Fiscal Year 1983 Ammunition Procurement And Modernization Programs

At the request of the Chairman, Subcommittee on Defense, House Committee on Appropriations, GAO reviewed the military services' requests for funds to purchase conventional ammunition and to modernize ammunition production facilities.

GAO recommends that the Committee (1) reduce the services' $4 billion request for ammunition items by $625.1 million, (2) reduce the Army's $433.4 million request for the ammunition production base by $15.5 million, and (3) closely monitor ammunition programs for three items until problems are resolved.

GAO/PLRD-82-92
AUGUST 10, 1982

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON D.C. 20548

B-207875

The Honorable Joseph P. Addabbo
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

Your October 7, 1981, letter asked us to review the military services' justifications for their fiscal year 1983 appropriation requests for procuring conventional ammunition and the ammunition production base.

As requested, we limited our review primarily to evaluating (1) ammunition items involving the largest dollar amounts, being bought for the first time, and those having production and/or performance problems and (2) Army projects for establishing, modernizing, and expanding the ammunition production base. On the basis of our evaluations, we are recommending that the Committee reduce the military services' requests by $640.6 million and closely monitor three ammunition items to assure that corrective actions are taken.

On March 18, 1982, we gave your Office the requested fact sheets and questions for use during the Committee's appropriations hearings. This report provides additional information on the results of our review.

As arranged with your Office, we are not including the Viper light antitank weapon in this report because our concerns about the weapon were presented in our report to the Secretary of Defense, entitled "Concerns About the Army's Viper Light Antitank Weapon" (C-MASAD-81-19, July 28, 1981), a copy of which was provided to you.

As directed by the Subcommittee, we did not obtain agency comments on the matters discussed in this report. We did, however, discuss the report with program officials and incorporated their views where appropriate.

As arranged with your Office, we are sending copies of this report to the Chairmen, House Committees on Armed Services and on Government Operations and Senate Committees on Appropriations, on Armed Services, and on Governmental Affairs; the Director, Office of Management and Budget; the Secretaries of Defense, the Army, the Navy, and the Air Force; and the Commandant of the Marine Corps. Copies will also be made available to other interested parties upon request.

Sincerely yours,

Charles A. Bowsher

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE CHAIRMAN, SUBCOMMITTEE ON DEFENSE, HOUSE COMMITTEE ON APPROPRIATIONS

RECOMMENDED REDUCTIONS TO FISCAL YEAR 1983 AMMUNITION PROCUREMENT AND MODERNIZATION PROGRAMS

D I G E S T

The President's fiscal year 1983 budget request included $4 billion for ammunition and $433.4 million for ammunition production base support facilities. The Subcommittee asked GAO to evaluate the adequacy of the services' justifications for the amounts requested and to recommend adjustments where warranted.

AMMUNITION

GAO primarily reviewed the justifications for items involving large dollar amounts, those being bought for the first time, and those with production and/or performance problems. Most items were adequately justified. However, GAO concluded that the request for ammunition should be reduced by $625.1 million, or about 16 percent. Most of these reductions are for newer munitions still in the developmental stage, such as laser-guided projectiles, antiarmor cluster munitions, and area denial artillery munitions. Sizable backlogs have accumulated for some of these items because of production and performance problems.

Army

GAO reviewed 94 items representing $1.6 billion, or 73 percent, of the Army's $2.2 billion request and recommends that the requests for 19 items be reduced by $464.3 million for the following reasons:

--$260.7 million for three items should not be provided because of production, technical, and performance problems. (See pp. 5 to 12.)

--$120.6 million for ten items is not needed because requirements can be satisfied with inventory already on hand or on order. (See pp. 12 to 19.)

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Tear Sheet

--$81.2 million for four items is premature because large quantities have been funded in prior years but not yet delivered. (See pp. 19 to 23.)

--$1.8 million for two items is not needed because less expensive packaging can be used for blank training rounds. (See pp. 23 to 24.)

This report also discusses current problems with 155-mm. improved conventional munitions, the new 155-mm. training round, and the 105-mm. high explosive antitank round. These problems will require special management attention by the Army and warrant close monitoring by the Subcommittee. (See pp. 24 to 27.)

Navy

GAO reviewed 46 items representing $183 million, or 55 percent, of the Navy's $335.4 million request and recommends that requests for 7 items be reduced by $24 million for the following reasons:

--$5.7 million for five items is not needed because inventory will exceed requirements. (See pp. 28 to 30.)

--$18.3 million for two items is unnecessary because of large quantities funded in prior years but not yet delivered. (See pp. 31 to 32.)

Marine Corps

GAO reviewed 19 items representing $475.4 million, or 75 percent, of the Marine Corps' $630.2 million request and recommends that requests for six items be reduced by $62.7 million for the following reasons:

--$20.9 million for 155-mm. Copperhead projectiles is not needed because of significant production, technical, and operational problems. (See p. 32.)

--$37.5 million for 155-mm. area denial artillery munitions and remote antiarmor mine system projectiles is premature because large quantities funded in prior years have not yet been delivered and the Marine

Corps overstated its unit costs. (See pp. 32 to 34.)

--$4.3 million for three items is not needed because the Marine Corps overstated the unit costs. (See p. 33.)

Air Force

GAO reviewed 19 items representing $702.5 million, or 83 percent, of the Air Force's $845.6 million request and recommends that requests for four items be reduced by $74.1 million for the following reasons:

--$54.4 million for CBU-90/B antiarmor cluster munitions is premature because of significant developmental problems and the program's future is uncertain. (See pp. 35 to 37.)

--$13.8 million for M-206 infrared cartridge flares is not needed because it can be procured at a lower cost than estimated in the budget. (See pp. 37 to 38.)

--$5.0 million for BDU-33 practice bombs is not needed because of decreased consumption forecasts. (See pp. 38 to 39.)

--$900,000 for BSU-50 air inflatable retarders is not needed because a portion of the total program will not be delivered until after the fiscal year 1983 funded delivery period. (See p. 39.)

PRODUCTION BASE SUPPORT

GAO reviewed the justifications for seven projects representing $40.6 million, or 9 percent, of the $433.4 million request for production base support and recommends that requests for two projects be reduced by $15.5 million for the following reasons:

--$4.8 million for an automated grenade loading facility is premature because the prototype equipment has not been developed. (See pp. 40 to 42.)

--$10.7 million for expanding an antiarmor cluster munition facility is premature because of developmental problems and the Air Force is seriously considering canceling the program. (See p. 42.)

AGENCY COMMENTS

As directed by the Subcommittee, GAO did not obtain agency comments on matters discussed in this report. Instead, GAO discussed the report findings with program officials. They generally agreed with GAO's findings but did not agree with all of the recommended adjustments. Their views were incorporated in the report where appropriate.

Contents

ABBREVIATIONS

AAP	Army ammunition plant
ADAM	area denial artillery munition
DIVAD	division air defense
GAO	General Accounting Office
LAP	load, assemble, and pack
RAAMS	remote antiarmor mine systems

CHAPTER 1

INTRODUCTION

The military services' fiscal year 1983 appropriation request for ammunition was about $4.45 billion, including the Army's request for production base support for $433.4 million, as summarized below.

Appropriations	Budget lines	Amount (millions)
Procurement of Ammunition, Army		
Atomic materiel	3	$ 22.6
Conventional ammunition	36	2,107.5
Miscellaneous	4	75.5
Production base support	3	433.4
Total	46	2,639.0
Other Procurement, Navy		
Air-launched ordnance	16	208.1
Ship gun ammunition	5	90.2
Small arms ammunition	1	15.5
Pyrotechnics and demolition	1	21.6
Total	23	335.4
Procurement, Marine Corps		
Conventional ammunition	40	630.2
Other Procurement, Air Force		
Rockets and launchers	1	1.9
Cartridges	16	234.4
Bombs	12	440.3
Targets	2	8.4
Fuzes	5	37.7
Other items	12	122.9
Total	48	845.6
Total	157	$4,450.2

A summary of the Army's request for production base support is on the following page.

	Budget lines	Amount
		(millions)
Provision of industrial facilities:	1	
Modernization, expansion, and initial production facilities		$358.2
Production support and equipment replacement		33.6
Layaway of industrial facilities	1	17.2
Manufacturing technology program	1	24.4
Total	3	$433.4

The total fiscal year 1983 program is higher than the fiscal years 1981 and 1982 programs. Compared to the fiscal year 1982 program, Army and Marine Corps programs increased, while the Air Force and Navy programs decreased as shown below.

	Fiscal year program		
	1981	1982	1983
	---------(millions)---------		
Ammunition			
Army	$1,211.9	$1,990.6	$2,205.6
Air Force	344.4	1,076.5	845.6
Marine Corps	81.6	314.5	630.2
Navy	254.6	399.8	335.4
Total	1,892.5	3,781.4	4,016.8
Production base support			
Army	346.8	311.9	433.4
Total	$2,239.3	$4,093.3	$4,450.2

The services justified their ammunition requests on the basis of meeting training needs and building the war reserve stockpile. Much of the request is for newer munitions, such as laser-guided projectiles, rocket-assisted projectiles, improved conventional munitions, area denial artillery munitions, remote anti-armor mine systems, and antiarmor cluster munitions.

Production base support funds are intended to enhance ammunition production capacity by modernizing existing production facilities, building new facilities, properly laying away facilities not needed for peacetime production, and developing improved

manufacturing methods. In addition, the Army plans to improve support facilities, such as administration buildings and utilities.

OBJECTIVES, SCOPE, AND METHODOLOGY

Our review was made at the request of the Chairman, Subcommittee on Defense, House Committee on Appropriations. Our objectives were to assess the adequacy of justifications for the military services' fiscal year 1983 ammunition programs and the Army's production base support program.

As the Subcommittee requested, we evaluated requests involving large dollar amounts, items being bought for the first time, items that are having production and/or performance problems, and projects to establish, modernize, and expand the ammunition production base.

Because of the enormous size of the fiscal year 1983 program, complexity of the issues, and relatively short time frame, we could not assess all items. Therefore, as in the past, we reviewed basic factors, such as requirements, inventory positions, production problems, quality, testing and development, funded program status, field malfunctions, and past reprograming actions, for all items. Also, we determined whether the programs could be executed in an efficient and economic manner during the normal time period for fiscal year 1983 program delivery. In addition, we attempted to isolate items with production and performance problems of such magnitude that providing additional funding was questionable.

Because of time constraints, we did not make an extensive verification of data such as inventory, unit costs, and production schedules provided by the services. However, because of prior years' experience in reviewing many of the same items, we were able to assess whether the justification data was reasonable relative to previous data.

In reviewing the justification for specific ammunition items and projects, we interviewed officials involved in ammunition management and procurement and obtained documents, such as briefings, status reports, production problem meeting minutes, and budget support data, from the services at the following locations:

--Headquarters, Department of the Army, Washington, D.C.

--U.S. Army Armament Materiel Readiness Command, Rock Island, Illinois.

--U.S. Army Munitions Production Base Modernization Agency, Dover, New Jersey.

--U.S. Army Armament Research and Development Command, Dover, New Jersey.

--Project Manager, Division Air Defense Gun System, Dover, New Jersey.

--Project Manager, Cannon Artillery Weapons Systems, Dover, New Jersey.

--Product Manager's Office for 30-mm. Ammunition, Dover, New Jersey.

--Kansas Army Ammunition Plant, Parsons, Kansas.

--Volunteer Army Ammunition Plant, Chattanooga, Tennessee.

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

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

--Ships Parts Control Center, Mechanicsburg, Pennsylvania.

--Marine Corps Headquarters, Rosslyn, Virginia.

--U.S. Air Force Systems Command, Armament Division, Eglin Air Force Base, Florida.

--Ogden Air Logistics Center, Hill Air Force Base, Utah.

As directed by the Subcommittee, we did not obtain agency comments on matters in this report, but we did discuss a draft of this report with program officials of the Army's Office of the Deputy Chief of Staff for Research, Development, and Acquisition; the Navy's Office of the Deputy Chief of Naval Operations for Logistics; the Air Force's Office of the Deputy Chief of Staff for Logistics and Engineering; and the Marine Corps' Office of Deputy Chief of Staff for Installations and Logistics. We made changes to the report, where appropriate, to reflect the views of these program officials.

Our review was performed in accordance with our current "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

CHAPTER 2

ARMY AMMUNITION PROGRAM

The Army's fiscal year 1983 ammunition request includes $2.1 billion for conventional ammunition, $75.5 million for miscellaneous items, and $22.6 million for nuclear materials. We reviewed the Army's justification for 94 ammunition end items, costing $1.6 billion, or 73 percent, of the request. We concluded that $464.3 million should not be provided for the following reasons:

- --It is premature to provide $260.7 million for three items until production, technical, and performance problems are resolved.
- --A total of $120.6 million requested for 10 items is unnecessary because inventory will exceed requirements.
- --A total of $81.2 million requested for four items is not needed because large quantities have been funded in prior years but not yet delivered.
- --A total of $1.8 million of $38.6 million requested for two training items is not needed because less expensive packaging can be used.

Also, the Committee should be aware of production and performance problems with M483A1 improved conventional munitions and cost problems with M804 training projectiles. No fiscal year 1983 funds were requested for the M456A2, but production and performance problems exist with the fiscal year 1982 program.

PREMATURE PROCUREMENTS

The Army's fiscal year 1983 program includes premature requests of $260.7 million for the following three items:

- --$183.6 million for 155-mm. Copperhead projectiles.
- --$55.1 million for 30-mm. high explosive, dual purpose cartridges.
- --$22 million for 40-mm. high-explosive proximity-fuzed cartridges.

Copperhead

The Army requested $183.6 million for 7,629 Copperhead projectiles. 1/ The Copperhead was developed to provide a high

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1/In addition, the Marine Corps' request includes $20.9 million for 791 Copperhead projectiles.

probability of hitting either a moving or stationary target by homing on energy created by a laser beam hitting the target. We believe this request is not justified because (1) the Army has not achieved the 80-percent reliability level specified by the Secretary of Defense which must be attained before production can be increased, (2) deliveries are significantly behind schedule, (3) actions planned to contain costs have not beer implemented and the actual unit cost is uncertain, and (4) low reliability and high cost, coupled with the Copperhead's inherent operational performance limitations, could make its fielding impractical.

The Copperhead's production testing indicates technical deficiencies must be overcome before its reliability can reach the required level. Production tests include first article, initial production, and lot acceptance tests. Of the 20 projectiles tested during first article, only 13, or 65 percent, were scored as reliable. Of the seven failures, five were caused by such deficiencies as broken fins, inoperable wings, and improper gyroscope assembly. The remainder was caused by operational errors. Initial production testing was also not very successful. Of the 125 planned firings, only 77 had been made, with a 64-percent reliability. Project office officials said the failures were caused by deficiencies similar to those found during first article testing. The third type of production tests--lot acceptance testing--was planned for February 1982; but at the time of our review, testing had not begun.

Historically, the Copperhead's reliability has been uncertain. Based on operational and developmental testing in 1979, the Copperhead's estimated reliability ranged from a low of 45 percent, computed by the Army's Test and Materiel Evaluation Directorate, to a high of 72 percent, computed by the Copperhead's project office. Because of the low reliability, the Secretary of Defense has limited production to 200 projectiles a month, until reliability of at least 80 percent is achieved. A 75-round live firing test was scheduled for June 1982 to determine if the Copperhead had achieved 80 percent reliability. These tests started on June 18, 1982, but were stopped on July 8, 1982, after firing 45 rounds because only 67 percent were scored as reliable. New demonstration tests are scheduled for November 1982 to January 1983.

Also, the Army will receive far less than the expected deliveries before the contract is awarded for the fiscal year 1982 program since Copperhead projectiles are behind schedule. During fiscal year 1982 Defense appropriation hearings, the Army testified that 1,300 projectiles would be delivered at the time of full contract award in May 1982. However, as of May 1982, only 778 projectiles of the scheduled deliveries, or about 60 percent, had been delivered. The Copperhead project manager stated that the delays were primarily due to one subcontractor supplying a critical electronic component.

The Copperhead has also experienced significant cost growth, resulting in 58 percent fewer Copperhead rounds under contract or planned as compared to estimates made about 3 years ago, as shown in the table below.

Program at January 1979

	Fiscal year			
	1980	1981	1982	Total
Estimated quantities	4,000	7,000	10,000	21,000
Estimated funding (millions)	$ 66.3	$ 128.5	$ 122.0	$ 316.8
Estimated unit cost	$16,575	$18,357	$12,200	

Program at February 1982

	Fiscal year			
	1980	1981	1982	Total
Quantity under contract or planned	1,075	3,125	4,550	8,750
Funding provided (millions)	$ 71.2	$ 117.6	$ 141.5	$330.3
Actual or estimated unit cost (note a)	$44,952	$44,952	$31,099	

a/Fiscal years 1980 and 1981 unit costs were determined by dividing the combined procurement dollars for those years by the combined quantities because some 1980 projectiles were to be completed with 1981 funds in fiscal year 1981.

The Army orginally planned to procure large quantities of the Copperhead on a competitive basis. However, this competitive procurement strategy was abandoned when, according to Army officials, the approved total program was reduced from 110,236 rounds to 44,486 rounds because of the Copperhead's performance capabilities. These officials also said that the lack of competition, the quantity reduction, and a design change which required using titanium instead of plastic were the primary reasons for the increased cost.

The contractor has initiated actions to contain costs. For example, in March 1982, the contractor submitted proposals to convert the fiscal years 1980 and 1981 cost plus incentive fee contracts to firm-fixed price contracts. These proposals provided the project office with upper limits for unit costs, which the Army is using to develop cost and price objectives for negotiations and to identify areas for cost reductions.

Although we did not review the contractor's proposals, we did review preliminary Army planning information on fiscal years 1982 and 1983 procurements. Our analysis disclosed that the Army expects to pay $35,400 for each Copperhead projectile in fiscal year 1982 and $32,800 for each projectile in fiscal year 1983.

Even though the impact of the Copperhead's unit cost to the monthly quantity being produced had not been determined, Army representatives believed the monthly production rates partially caused the varying unit costs.

Finally, the Copperhead has inherent performance limitations. Because the Copperhead requires uninterrupted line-of-sight between (1) the forward observer and the target and (2) the projectile-in-flight and the target for a few seconds, numerous factors can degrade or negate its performance. Such factors include cloud cover, adverse weather, and enemy countermeasures.

As early as June 1979, the Army's Operational Test and Evaluation Agency concluded that in a favorable environment, the Copperhead is effective, but under battlefield conditions its contribution in an antiarmor battle is questionable. These test results and the Copperhead's limitations, technical difficulties during development, and other issues have been discussed in several of our reports. 1/

Army representatives said that they believed the Copperhead would achieve 80-percent reliability by June 1982 and that costs would be under control when negotiations are completed for a fiscal year 1982 firm-fixed price contract. We believe optimism in production deliveries may be warranted because Copperhead deliveries increased steadily from January to May 1982. However, the Copperhead's demonstrated reliability as of July 1982 was still only 67 percent. Army representatives now believe the Copperhead will achieve 80-percent reliability by January 1983. Further, while the firm fixed price contract will establish an upper limit for unit cost, the cost effectiveness of the projectile has to be demonstrated.

1/"Status of the Army's Copperhead and the Navy's 5-Inch and 8-Inch Guided Projectile Programs" (PSAD-77-26, Apr. 1, 1977); "Status of the Army's Copperhead and the Navy's 5-Inch and 8-Inch Guided Projectile Programs" (PSAD-78-38, May 1, 1978); "Army's Fiscal Year 1979 Programs for Procuring Conventional Ammunition and Related Production Base Support" (LCD-78-419, May 15, 1978); "The Army's Copperhead and the Navy's 5-Inch and 8-Inch Guided Projectile Programs" (PSAD-79-34, Feb. 20, 1979); "Army's FY 1980 Programs for Procuring Conventional Ammunition, Modernization, and Expansion" (LCD-79-416, June 15, 1979); "Future Procurements of Army's Copperhead Projectile Should Be Contingent on Improvements in Performance and Reliability" (C-PSAD-81-4, Nov. 13, 1980); and "Adjustments Recommended in Fiscal Year 1982 Ammunition Procurement and Modernization Programs" (PLRD-81-35, June 30, 1981).

Because of the Copperhead's technical deficiencies, low reliability, unit cost uncertainty, and performance limitations, further funding at this time is not justified. We believe no further funding should be provided for Copperhead until its reliability and cost effectiveness are demonstrated. Undelivered prior year programs can be stretched-out to maintain production continuity, although at a low rate, without the fiscal year 1983 buy.

As of May 1982, the Copperhead was expected to achieve 80-percent reliability in June 1982, when about 7,800 projectiles will remain undelivered. This quantity could provide production continuity through December 1984, at an average rate of about 260 projectiles a month. At that time, assuming a fiscal year 1984 buy is funded, deliveries could begin at a more economical production rate. The constrained production rate through December 1984 will probably cause some unit cost increase. However, it would be a less risky approach and without knowing the sensitivity of the Copperhead's unit cost to monthly production rates, the cost of this reduced rate cannot be determined.

30-mm. high explosive, dual purpose cartridge

The $64.1 million request for 30-mm. ammunition includes $55.1 million for 1,374,000 XM789 antiarmor/antipersonnel (tactical) rounds used in the XM230 chain gun. The chain gun and 2.75-inch rockets are the secondary armament systems for the AH-64 advanced attack helicopter. We believe this $55.1 million request is premature because the fiscal year 1982 program will provide adequate quantities of ammunition before the AH-64 is delivered and AH-64 deliveries may be later than planned because of delays in production approval.

The request for XM789 projectiles would provide large quantities of ammunition before the first AH-64 helicopter is delivered in fiscal year 1984. The Army's fiscal year 1983 request is for 613,000 target practice rounds and 1,374,000 tactical rounds. Based on the Army's production schedules for fiscal years 1982 and 1983, the Army would have about 400,000 target practice rounds and 1,064,000 tactical rounds before the first AH-64 is delivered. Deferring further procurements of the tactical round until fiscal year 1984 would still provide the 158,000 tactical rounds funded in fiscal year 1982 and the 400,000 target practice rounds funded in fiscal years 1982 and 1983.

Production approval for the AH-64, after being delayed twice, was obtained on March 26, 1982. In an earlier report, 1/

1/"The Army's Advanced Attack Helicopter Is Not Ready for Production" (MASAD-82-8, Dec. 1, 1981).

we stated that there were a number of risks and uncertainties about the AH-64 which warranted delaying the helicopter's production until better information and more analysis were provided. For example, we stated that:

--Production decision data included test results for two key subsystems--the target acquisition designation sight and the helicopter engine--whose configurations differed from the production aircraft subsystems.

--The contractor may not be ready to produce the helicopters.

We concluded that the scheduled production decision would be made relying on incomplete information, questionable evaluations, and optimistic projections.

The product manager expressed concern that deferment of the fiscal year 1983 ammunition program could result in a costly production interruption. He provided a preliminary delivery schedule, showing production continuity for fiscal years 1982, 1983, and 1984. The schedule showed an 8-month production gap if the program is not funded in fiscal year 1983. However, no estimate was made for the load, assemble, and pack (LAP) costs or for component supplier costs associated with an interrupted production. According to a production base modernization agency's facility project engineer, the tactical rounds and target practice rounds could be produced using the same LAP line, except for several unique modules required for tactical rounds. These modules, which have not been delivered, are scheduled for installation in August 1982 and their layaway costs will be minimal, according to the engineer. We found that the LAP line could operate at a minimum sustaining rate until fiscal year 1984 deliveries begin.

Army representatives said that the fiscal year 1983 program is required to maintain production continuity and is not driven by aircraft quantities on a year-by-year basis. They also said that the fiscal year 1983 program will provide adequate support to the 11 AH-64 helicopters being delivered through August 1984.

We believe the Army's request for additional XM789 tactical rounds in fiscal year 1983 is not needed because of delays in the fiscal year 1982 contract award and potential delays in AH-64 deliveries. Further, even without the fiscal year 1983 program, adequate quantities of ammunition will be available before the first AH-64 is delivered. A fiscal year 1984 request would allow more time to prove-out the new production facility and to phase in larger procurements.

40-mm. high explosive cartridge with proximity fuze

The $70.9 million requested for 40-mm. ammunition included funds for target practice rounds, high explosive rounds with point detonating fuzes, and proximity-fuzed rounds. We believe

the $51.4 million requested for 95,000 XM822 proximity-fuzed rounds should be reduced by $22 million because (1) a new propellant must be developed for the ammunition and (2) the request exceeds the amount required to meet an existing fixed-price contract option.

The fiscal year 1983 request for the proximity-fuzed rounds should be reduced to $29.4 million, the amount needed to exercise option 2 of the fixed price contract and the amount originally planned. Our review disclosed that the Army planned to request only $29.4 million for this round--$13 million for 24,700 proximity rounds and $16.4 million for long-leadtime components. However, the amount was increased by the Office of the Secretary of Defense to include $51.4 million for 95,000 complete rounds.

The proximity-fuzed round is used in the Army's new division air defense gun, commonly referred to as DIVAD, which was developed using a European 40-mm. gun and associated ammunition. A technology transfer, fabrication, and testing program was initiated to establish a U.S.-production capability for the foreign gun and its spare parts and ammunition. A critical part of this effort includes finding suitable U.S. sources for the foreign metals, plastics, and explosives and developing a compatible propellant for the U.S.-produced ammunition. Also, the new propellant must have a muzzle velocity which exceeds that demonstrated during testing with foreign-produced ammunition. The Army has concluded the increased muzzle velocity is cost effective because it reduces the number of rounds required to achieve kill levels at long-range targets.

Because of problems in developing a suitable propellant, the contractor failed to provide 10,000 target practice rounds for testing. Consequently, the contractor has proposed extending the technology transfer, fabrication, and testing program until October 1983. Until this program proves successful, proximity-fuzed rounds funded in fiscal year 1982 and requested in fiscal year 1983 cannot be produced in the United States. Therefore, the Army proposes to reduce the specified velocity and procure a propellant which will match the foreign velocity. All DIVAD ammunition, including inert target practice, high-explosive rounds with point detonating or proximity fuzes, were to use the U.S.-developed propellant to increase muzzle velocity. Army representatives said that this propellant would decrease performance of the proximity-fuzed rounds but would not affect performance of its other two rounds.

Army representatives told us that the contractor has embarked on a multifaceted propellant development program and that the results appear promising. Further, the Army plans to use an offshore propellant if the propellant is not available for initial ammunition quantities. This would reduce performance of the proximity-fuzed round.

The Army's request to procure large quantities of proximity-fuzed rounds in fiscal year 1983 is not justified because a propellant meeting specified velocity requirements is not available. Also, the Army's request exceeds, by about $22 million, the amount required to exercise a fixed-price contract option. In our opinion, this increased funding is premature because the U.S. round is not approved for production.

INVENTORY WILL EXCEED REQUIREMENTS

The Army's request should be reduced by $120.6 million for 10 items, including 2 items with a $58.1 million partial reduction, because inventory will exceed requirements. This request should be reduced by

--$6.4 million for 7.62-mm. ball and tracer cartridges,

--$1.8 million for three types of 14.5-mm. cartridges,

--$0.9 million for 20-mm. target practice ball cartridges,

--$31.2 million for 4.2-inch illumination cartridges,

--$1.1 million for violet smoke hand grenades,

--$21.1 million for .50 caliber ball and tracer cartridges,

--$3.6 million of $5 million for .50 caliber armor piercing incendiary tracer cartridges, and

--$54.5 million of $85.5 million for 105-mm. discarding sabot target practice cartridges.

7.62-mm. ball linked cartridges

The $52.7 million request for 7.62-mm. ammunition includes $6.4 million for 17,102,000 ball linked cartridges used in training with machine guns. However, because of a sharp decrease in forecasted training consumption, the existing inventory and quantities due in are more than enough to meet demand and maintain the inventory objective through May 1984, the end of the fiscal year 1983 program, as shown on the following page.

	Quantity
Inventory at September 30, 1981	21,343,600
Due in	28,352,000
Total	49,695,600
Less: Estimated losses through May 1984	43,576,509
Projected inventory at May 1984	6,119,091
Inventory objective	3,886,000
Difference	2,333,091

Army representatives did not agree that the fiscal year 1983 program was not needed. They cited data available at the time the budget backup data was prepared to support their position. However, our analysis summarized in the chart was based on more recent requirements estimates which showed that the projected training consumption has decreased and therefore the fiscal year 1983 program is no longer needed. In addition, deleting the fiscal year 1983 program should not adversely affect production because program quantities for other items will maintain production above the minimum sustaining rate.

14.5-mm. cartridges

The $1.8 million request for 14.5-mm. cartridges with three different type fuzes is not needed. The Army's inventory projections supporting the request are understated because

--December 31, 1981, inventories were much higher than projected and

--training loss projections appear to be overstated when compared to historical usage.

As shown below, projected inventories were understated greatly, and the Army has continually overstated training losses.

Type	December 1981 inventory Projected	Actual
3-second fuze	109,000	157,100
6-second fuze	60,000	130,300
Point detonating fuze	909,000	1,484,400
Total	1,078,000	1,771,800

Type	Average monthly losses		
	October 1979 to December 1981		January 1982 to July 1984 (note a)
	Projected	Actual	Projected
3-second fuze	4,378	1,244	4,710
6-second fuze	3,667	1,307	4,548
Point detonating fuze	52,556	17,448	50,097
Total	60,601	19,999	59,355

a/The fiscal year 1983 program is scheduled to be completed in July 1984.

As shown below, we estimate that inventories as of July 31, 1984, without the fiscal year 1983 program, will be well above the inventory's objectives.

Type	Projected inventory as of July 31, 1984, without the 1983 program	Inventory objective
3-second fuze	107,242	15,000
6-second fuze	79,150	14,000
Point detonating fuze	1,131,983	132,000

Our analysis was based on actual December 31, 1981, inventories, quantities due in from a prior year program, and estimated training losses based on more reasonable historical consumption.

Army representatives agreed that projected losses were overstated and that the fiscal year 1983 program is not needed. They stated that since the 14.5-mm. cartridge is manufactured commercially, it could be obtained rapidly if the demand were to increase.

20-mm. target practice ball cartridges

The $21.1 million for 20-mm. cartridges includes $900,000 for 235,000 target practice ball cartridges. These cartridges are no longer needed because, since the budget was sent to the Congress, future requirements have dropped to zero and sufficient inventory exists to meet demands. In fact, without a 1983 quantity, inventory at the end of the fiscal year 1983 program in July 1984 will be 171,000 cartridges against the zero inventory objective.

Army representatives agreed that the $900,000 requested for the target practice cartridges is no longer needed.

4.2-inch illuminating cartridge

The $55.3 million request for 4.2-inch ammunition includes $31.2 million for 136,000 illuminating cartridges used for target identification during low visibility. None of the request is needed because the existing inventory and quantities due in exceed requirements.

As shown in the table below, the existing inventory and quantities due in are adequate to meet demand and the inventory objective through September 1984, when the funded delivery period ends.

	Quantity
Inventory at September 30, 1981	396,000
Due in	525,000
Total	921,000
Less: Estimated losses through September 1984	551,000
Projected inventory at September 1984	370,000
Inventory objective	157,000
Difference	213,000

If the request for 136,000 cartridges is funded, the September 1984 projected inventory would be 506,000, more than triple the inventory objective.

The Army forecasted production at or above the monthly minimum sustaining rate of 17,000 for pre-fiscal year 1983 programs and well below this rate for the 1983 program. For fiscal year 1982 and prior programs, production was generally forecasted at 17,000 to 23,000 rounds and for the fiscal year 1983 program it was forecasted at 11,000 to 12,000 rounds.

Further, a variety of problems resulted in delivery of 76,000 fewer rounds during fiscal year 1981 than projected. These problems included rounds functioning before they were supposed to (resulting in production shutdown) and difficulties in obtaining components; that is, one supplier's plant burned and another supplier went bankrupt. The Army anticipates problems with component delivery until the start of fiscal year 1982 program production.

Army representatives agreed that the inventory of 4.2-inch illuminating cartridges would exceed requirements at the end of the fiscal year 1983 funded delivery period. They said that no

buys are programmed for fiscal years 1984 through 1988; consequently, a fiscal year 1983 program would not result in an excess inventory because the projected assets in fiscal year 1988 would be well below the stated requirements. Because additional cartridges are not needed in fiscal year 1983, we believe it is premature to provide additional funds for this item.

Violet smoke hand grenade

The $12.5 million request for hand grenades includes $1.1 million for 60,000 violet smoke hand grenades used for signaling. The $1.1 million request is not needed because, based on more current inventory data, the projected fiscal year 1984 inventory of 129,000 grenades, without the 1983 program, will exceed the Army's requirements of 66,000 grenades.

In computing requirements for this item, the Army estimated an inventory of 140,000 grenades at June 30, 1981. However, actual inventory was 200,000 grenades. This 60,000 difference is identical to the quantity requested in fiscal year 1983 and precludes the need for a fiscal year 1983 program. Sufficient quantities of other smoke hand grenades remain in the program to permit operating the production line above the minimum sustaining rate.

Army representatives agreed that the fiscal year 1983 request for these grenades is not needed.

.50 caliber cartridges

The $93.6 million request for .50 caliber cartridges includes $21.1 million for 11,810,000 ball and tracer cartridges and $5 million for 2,144,000 armor piercing incendiary tracer cartridges. Because inventories will exceed requirements through the end of the fiscal year 1983 program period, May 1984, none of the $21.1 million for ball and tracer cartridges is needed and $3.6 million of the $5 million request for armor piercing cartridges is not needed.

Using updated training loss projections, we found that sufficient quantities of ball and tracer cartridges are in the inventory and are due in to meet needs through May 1984, as shown in the following page.

	Quantity
Inventory at September 30, 1981	10,889,100
Due in	21,025,000
Total	31,914,100
Less: Estimated losses through May 1984	26,469,366
Projected inventory at May 1984	5,444,734
Inventory objective	1,217,000
Difference	4,227,734

Funding the fiscal year 1983 program would result in an even greater imbalance than not funding the program.

If the request for 2,144,000 armor piercing cartridges is funded, the assets on hand after the fiscal year 1983 program would exceed the inventory objective by about 1.5 million cartridges or about twice the inventory objective. Certainly, it is unreasonable to expect assets to exactly equal the inventory objective; however, the difference in the present case is excessive. Therefore, we believe the program should be reduced by 1.5 million cartridges, costing $3.6 million. This reduction will not adversely affect production levels because sufficient production is scheduled for other similar items.

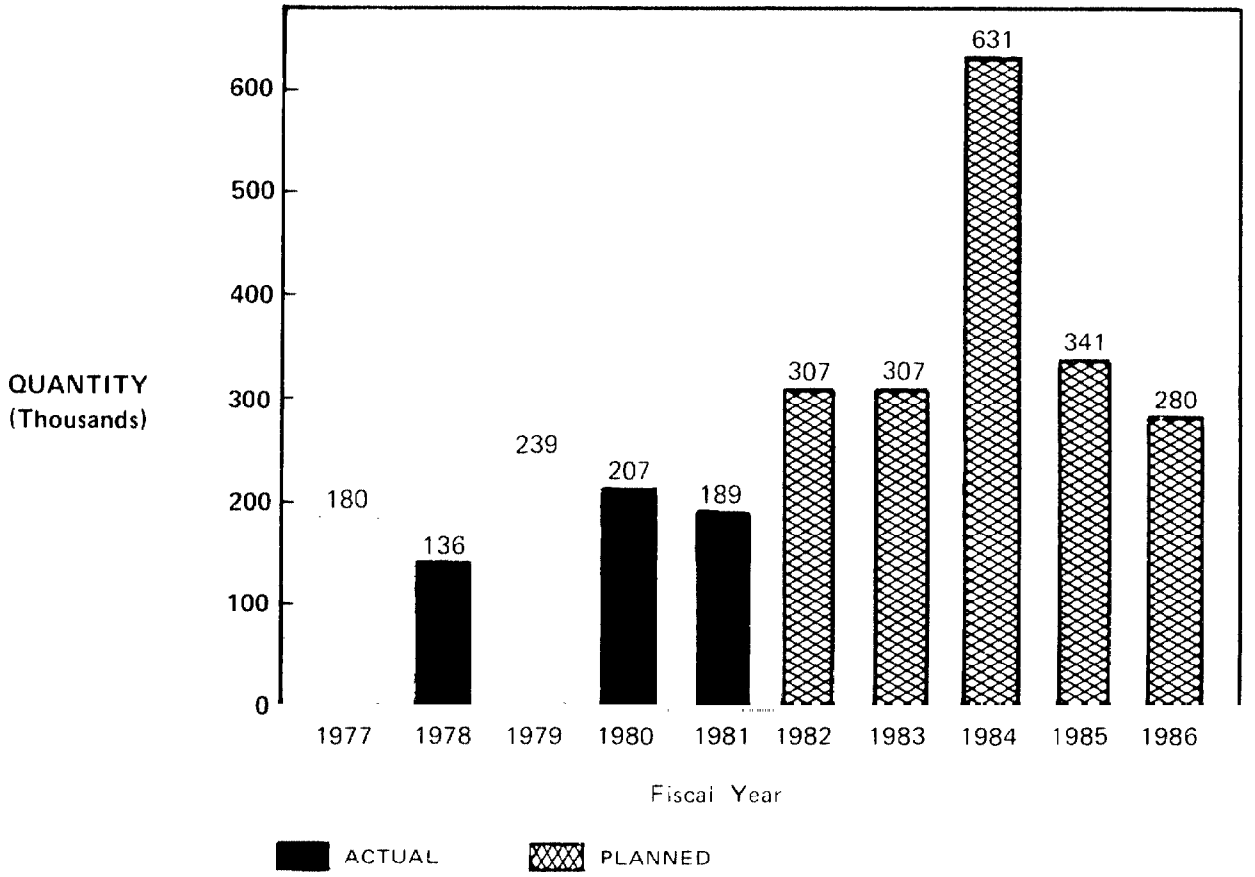
Army representatives did not agree that the fiscal year 1983 ball and tracer program was not needed. However, they did agree that $900,000 of the $5 million request for armor piercing cartridges was not needed. Their position was based on data available at the time they prepared the budget backup data. However, our analysis is based on more recent data.

105-mm. discarding sabot target practice cartridge

The $154.8 million request for 105-mm. ammunition includes $85.5 million for 397,000 M724 discarding sabot target practice cartridges used for training in tank mounted 105-mm. gun cannons. The request should be reduced by $54.5 million because the fiscal year 1984 training loss projection supporting the request is overstated.

Based, in part, on a fiscal year 1984 training loss estimate of 631,000 rounds, the Army is projecting an inventory level of 24,000 cartridges after the 1983 program, which is 61,000 cartridges less than the inventory objective of 85,000 cartridges. However, the training loss projection of 631,000 rounds appears

excessive when compared to training requirements for other years, as shown in the following chart.



Army representatives at the U.S. Army Armament Materiel Readiness Command agreed that the fiscal year 1984 training loss projection appeared excessive and requested that the Army's Office of the Deputy Chief of Staff for Operations reduce the fiscal year 1984 training projection. In discussing this matter with an Army representative in the Office of the Deputy Chief of Staff for Operations, we were told that this projection is the total amount of ammunition that the major commands estimate they will need for a given fiscal year. However, he was unable to explain why the fiscal year 1984 training projection was abnormally high when compared to actual consumptions from fiscal years 1977-81 and projected consumptions for fiscal years 1982-86.

If the request is reduced to 144,000 rounds, costing $31 million, then the inventory after the 1983 program will meet requirements of 85,000 and cover a fiscal year 1984 training loss of 318,700. This training loss approximates prior consumptions and future years' projections other than the fiscal year 1984 projection.

In addition, a warm production base will be maintained because production could be scheduled at 12,000 rounds a month on a one 8-hour shift a day for 5 days a week.

Finally, the XM797 developmental cartridge is scheduled to be procured in fiscal year 1985 as the training round for the M735 and the M774 tactical rounds. Therefore, an excessive inventory of M724 cartridges is not warranted.

Army representatives said that prior years' training losses have been constrained, this training round is one of the Army's highest training requirements, the fiscal year 1984 training loss projection is realistic, and no reduction to the fiscal year 1983 program is recommended. Our analysis clearly shows that actual or planned training consumption before and after fiscal year 1984 is substantially less than the Army's projected fiscal year 1984 training consumption. However, the Army was unable to explain why the fiscal year 1984 projection was abnormally high. Therefore, we believe that unless the Army can provide a better justification for the abnormally high training needs, the total requested amount should not be provided.

UNDELIVERED FUNDED PROGRAMS

The $190 million requested for the following items should be reduced by $81.2 million because significant quantities have been funded in prior years but not yet delivered.

--$26.1 million for area denial artillery munitions (ADAMs).

--$21.6 million for remote antiarmor mine systems (RAAMS).

--$24.1 million for 4.2-inch mortar ammunitions.

--$9.4 million for point detonating fuzes.

Although inventories of these items are well below the objectives, quantities cannot be delivered during the funded delivery period because of production backlogs. Total funding for these items would merely increase the size of the backlogs.

155-mm. area denial artillery munition and remote antiarmor mine system

The Army requested $57.9 million for 14,000 ADAMs and $98.6 million for 58,000 RAAMS. 1/ The request should be reduced because the programmed quantities cannot be produced within normal time frames for the fiscal year 1983 program.

1/As discussed in chapter 3, the Marine Corps requested $57.2 million for 12,711 ADAM projectiles and $38.1 million for 18,712 RAAMS projectiles.

The ADAM projectiles contain 36 antipersonnel mines and RAAMS projectiles contain nine antitank mines. Both systems use the M483 projectile carrier and disperse the mines while inflight. The mines are activated when disturbed or when a certain condition is sensed. The models in each system differ only in their preset self-destruct times.

According to Army officials, the quantities included in the fiscal year 1983 budget exceed those deliverable within the time specified in Army policy. To comply with Army guidance, the Army's Armament Systems Directorate recommended that the ADAM program be limited to 14,000 rounds (7,000 each for the Army and Marine Corps) and that the RAAMS program be limited to 52,000 rounds (35,000 for the Army and 17,000 for the Marine Corps). This action would reduce the Army's request by $47.7 million and the Marine Corps' request by $29.2 million.

The more appropriate quantities for fiscal year 1983 surfaced when the product manager analyzed the quantities funded since fiscal year 1979 and those not delivered within the specified delivery period. The manager found the following total Army and Marine Corps undelivered programs.

Fiscal year	Quantity	
	ADAM	RAAMS
1980 and prior	6,960	19,632
1981	9,000	23,672
1982	24,207	39,332
Total	40,167	82,636

The product manager said that production problems and excessive component reorder times caused delivery delays. The production problems apparently were resolved; however, the reorder problem remains. The reorder time for critical electronic components is now about 18 months rather than the estimated 12 months. The increased reorder time is significant when considering that the total time specified for reorder and delivery is 24 months divided equally between each activity. If the reorder time exceeds the 12 months, then less time is available for projectile deliveries. Since deliveries are generally preplanned at a production rate over the 12-month period, reducing the period causes undelivered projectiles at the end of the period and a backlog for any given fiscal year. This has occurred since fiscal year 1979 and backlogs will continue unless the production rate increases, the funded delivery period is extended, or the fiscal year quantities are adjusted.

The product manager evaluated alternatives to overcome the backlog condition, including an increase in production rates for ADAMs and multiple shifts. However, the rate could not be increased because the Louisiana Army Ammunition Plant (AAP) which produces this projectile also produces other rounds on the same production line. Multiple shift operation was considered, but was believed to be too costly and unnecessary.

To overcome late deliveries of ADAMs and RAAMS and enable deliveries of projectiles within the specified time, the Armament Systems Directorate has recommended that the quantities to be procured for fiscal year 1983 be reduced. We agree that these quantities should be limited to those that can be delivered within the specified funded delivery period and that the Army's request for these projectiles should be adjusted accordingly.

Army representatives agreed that the Army's request for ADAMs should be reduced by $26.1 million and that its request for RAAMS should be reduced by $21.6 million. They said that the Army will reprogram the funds to satisfy other funding requirements.

4.2-inch high explosive cartridge

The $55.3 million request for 4.2-inch ammunition includes $24.1 million for 177,000 high explosive cartridges that should not be funded because of production delays and ballistic test failures. At September 30, 1981, 557,000 rounds were undelivered from prior years' programs. Past production problems caused this backlog. For example, about 137,000 fewer rounds were accepted than forecasted from October 1979 through September 1981. This backlog represents about 40 months of production at the minimum sustaining rate of 14,000 cartridges a month, or enough to maintain production through January 1985.

Army representatives said that production problems have been resolved and that the backlog will be essentially eliminated during the fiscal year 1982 funded delivery period. Production problems included delays in obtaining production equipment for the projectile's metal parts, gaps between the explosive fill and the projectile base, and difficulties in producing the rubber obturator (a rubber ring used to seal the gap between the projectile and the mortar tube) within specifications.

We found that ballistic test failures were continuing. For example, three lots, consisting of 31,464 rounds, failed ballistic tests in November and December 1981 because of accuracy problems. In February 1982 the Army approved the contractor's recommendation to perform tests to identify the cause of the problems.

Considering past production experience, we believe the Army may not be able to eliminate the backlog and deliver the fiscal year

1983 program on time. Further, the Army needs time to resolve the problem of ballistic test failures. Therefore, funding the fiscal year 1983 program is unnecessary and would only increase the backlog. We believe delivery of fiscal year 1982 and prior years' programs should be scheduled at the minimum sustaining rate to give the Army time to completely resolve production and ballistic problems before additional funds are provided.

M739 point detonating fuze

The $108 million request for fuzes included $9.4 million for 467,000 M739 point detonating fuzes which are not needed because undelivered fuzes from prior years are sufficient to maintain production through the fiscal year 1983 program period. During fiscal years 1981 and 1982 congressional hearings, the Army said that it would eliminate the backlog; however, it did not do so because of production schedule slippages. As of September 30, 1981, the backlog was 1.8 million fuzes, only slightly less than last year's 2.1 million fuze backlog. The 1.8 million fuze backlog represents almost 13 months of production for the two current producers.

The following problems, dating back to 1978, have contributed to the backlog.

Problem	Delay
Delay in final certification of technical data package and contract award	5 months
Both manufacturers slipped first article tests due to startup problems and technical data package deficiencies	18 months
One manufacturer defaulted on its contract	7 months
Fuzes failed leak test	Unknown
Fuzes failed ballistic test	Unknown

Last year, the Army planned to increase production rates at all three contractors to eliminate the backlog before the fiscal year 1982 program began. Army officials are now predicting a 12-month delay, and the Army does not expect the fiscal year 1982 point detonating fuze program to be back on track until September 1983.

If the Army does eliminate the backlog, then another problem will surface. Planned future programs are not large enough to maintain two producers at the minimum sustaining rate. For example, the annual minimum sustaining rate for the two producers is 876,000 fuzes; however, the fiscal year 1983 program for all services and foreign military sales is only 531,000 fuzes.

To maintain both producers at the minimum sustaining rate, Army representatives estimated the fiscal year 1983 program would have to be increased by 345,000 fuzes.

The Army could eliminate the production backlog, meet inventory requirements, and maintain two active producers without a fiscal year 1983 program by using a more realistic production rate. For example, as of March 31, 1982, 2.5 million fuzes were undelivered from the fiscal year 1982 and prior programs. These fuzes could be produced over a 30-month period, from April 1982 to September 1984, using one manufacturer at a minimum sustaining rate and the other at a higher rate. The proposed fiscal years 1983 and 1984 programs could then be combined into one fiscal year 1984 program, of sufficient size to maintain two active producers.

According to an Army representative at the U.S. Army Armament Materiel Readiness Command, the Army is aware that future programs will not sustain two active producers and will result in the inventory exceeding requirements. The Army's immediate concern is to provide fuzes for all the projectiles in the inventory and to keep an active production base. However, this will result in producing more fuzes than projectiles. The Army representative agreed that with the fiscal year 1983 request the point detonating fuze inventory as of September 30, 1984, would exceed requirements by about 700,000 fuzes. However, even without a fiscal year 1983 request, the inventory would still exceed requirements by more than 300,000 fuzes.

Army representatives agreed that some backlog remains and that as of March 31, 1982, 2.5 million fuzes were undelivered from the fiscal years 1979 through 1982 programs. The table below gives the Army's projected average monthly deliveries.

	Monthly average
Apr. 1982 - Dec. 1982	167,444
Jan. 1983 - Dec. 1983	77,333
Jan. 1984 - Sept. 1984	33,777

We believe that this information clearly indicates that there are significant undelivered fuzes from prior years' programs which could be used to maintain production through the fiscal year 1983 program period.

EXCESSIVE PACKAGING COSTS

The Army's request included $22.7 million for 5.56-mm. blank cartridges and $15.9 million for 7.62-mm. blank cartridges. The 5.56-mm. blank cartridge request and the 7.62-mm. cartridge request

should be reduced by $0.8 million and $1 million, respectively, since the packaging material the Army is planning to use can be replaced with less expensive fiberboard containers.

In our 1981 report, 1/ we recommended that the Department of Defense use fiberboard containers instead of the more costly metal boxes and wirebound wood crates for small arms training ammunition. The Department of Defense agreed that the less expensive packaging material could be used for blank ammunition.

Army representatives agreed that less expensive packaging could be used and that the fiscal year 1983 request could be reduced by $1.8 million.

ITEMS REQUIRING SPECIAL ATTENTION

The Army is requesting $237.3 million to procure 155-mm. M483A1 improved conventional munition projectiles and $19.2 million to procure 155-mm. M804 training projectiles. However, both projectiles have encountered problems. For example, the 155-mm. M483A1 projectile has performance and production problems and the 155-mm. M804 training projectile has cost problems. Even though no fiscal year 1983 funds were requested for the M456A2, we are commenting on it because of continuing production and performance problems.

155-mm. high explosive improved conventional munitions

The Army's request includes $237.3 million for 428,000 M483A1 projectiles--more than double the fiscal year 1982 request. (The Marine Corps requested $131.7 million for 237,000 projectiles.) The M483A1 contains 88 dual-purpose grenades that are expelled during flight and dispersed over the target area, providing wider, more effective coverage than conventional projectiles.

In our 1981 report, 2/ we discussed ogive separations and cracked base plate problems and questioned whether the Army should continue a high volume of production considering these problems. The Army determined that ogive separations were an isolated incident and that the cracked base plates were a more serious problem. As a result, the projectiles are undergoing an expensive screening program that is expected to take 5 years and to cost about $22 million.

1/"DOD Can Save Millions by Using Less Expensive Packaging for Small Arms Training Ammunition" (PLRD-81-53, Aug. 18, 1981).

2/"Adjustments Recommended in Fiscal Year 1982 Ammunition Procurement and Modernization Programs" (PLRD-81-35, June 30, 1981).

The Army's malfunction investigation determined that the cracks could cause inbore detonations. Consequently, 1.4 million projectiles, representing 95 percent of the Army's inventory, were placed in an unserviceable category and restricted to emergency combat use until they are all screened. Preliminary results indicate that about 1 percent of the projectiles have cracked base plates. The Army has now instituted a new test at the manufacturer's plant to ensure earlier detection of base plate problems. The test adds only $.50 to the $555 projectile.

In addition, the Army has a large backlog of projectiles awaiting ballistic acceptance tests at the Army proving grounds. Consequently, the potential for costly rework programs exists. According to an Army official, in March 1982 about 150,000 M483A1 projectiles, representing about 4 months' production, were awaiting testing. If a problem is discovered during testing and the production line is stopped, the Army would still have to screen and/or rework 4 months' production. The testing backlog was caused by the following conditions:

--Bad weather at the proving grounds; that is, projectiles cannot be fired when the ground is snow covered or muddy because if the grenades do not detonate, they become a hazard to proving ground personnel.

--A temporary restriction on firing the M483A1 following the malfunction investigation.

--An increased workload at the proving grounds due to the need for testing new, as well as reworked, M483A1s.

Stored M483A1's reliability may also be a problem. The round performed satisfactorily on both the static and ballistic phases of its initial stockpile reliability test conducted from September to October 1980. But, the oldest lot tested performed the worst and, while the projectiles were less than 4 years old, some grenades had minor rust. In addition, stockpile reliability tests on similar improved conventional munition projectiles revealed high grenade malfunction rates. Consequently, the M483A1 stockpile should be closely monitored as stated in last year's report.

155-mm. training projectile

The Army's request includes $19.2 million for 151,000 155-mm. M804 training projectiles. This new inert projectile was intended to be a low-cost training alternative to the 155-mm. high explosive combat round. Although no M804 projectiles had been produced as of March 1982, an Army official said funding would probably stop after the fiscal years 1983 and 1984 programs because the round is too expensive. Currently, there is only a $21 difference between the M804 training round and combat rounds ($127 versus $148). A Marine Corps official said the Marine

Corps would not be interested in the training round unless its cost were reduced to about one fourth of the combat round cost.

Should the Army decide to discontinue funding the M804 round in the near future because of its cost, the Army should probably do so immediately because the funds requested for this round could be applied to the high explosive cartridge program. This would probably improve readiness and reduce unit costs for the high explosive round because of increased quantities.

105-mm. high explosive antitank cartridge

The Army did not request any fiscal year 1983 funds for the 105-mm. M456A2. However, we are reporting on this item because of numerous past problems and the current production backlog.

Last year we reported that the cartridge required special attention. It now appears the Army did not need the $53.1 million requested for the fiscal year 1982 program since production of the program is not scheduled to begin until October 1983 and therefore could have been accomplished with fiscal year 1983 funds.

During fiscal year 1981, only 11,000 of the scheduled 87,000 rounds, or 13 percent, were accepted into inventory. As of September 30, 1981, over 300,000 rounds remained to be delivered from previously funded programs. Completion is now scheduled for April 1985--more than 18 months late.

A series of technical and production problems contributed to the backlog. Specific problems include

--rounds cannot pass static tests, 1/

--the full frontal area impact switch does not function properly, and

--some projectiles are suspected of having cracks.

All these problems contributed to the fact that, at the time of our review, no acceptable rounds had been produced since March 1981.

The Army has been unable to produce any M546A2s that can pass static tests. However, the Army changed its test requirement and is now accepting these rounds as long as they pass a field dynamic test.

1/A laboratory test for penetrating ability.

Another problem confronting the M456A2 program is the failure of the full frontal area impact switch to function properly. This switch is supposed to increase the round's effectiveness against targets that it grazes rather than hits directly. However, the first three lots all failed the graze test. Since Army engineers could find no reason for the failures and since the switch did function against vertical targets, all three lots were accepted on waiver.

The Army encountered further problems with the M456A2 when it discovered that a manufacturer made unauthorized changes to quality control equipment. These changes, which allowed defective metal parts to go undetected, resulted in program delays and additional costs. Between the time the changes were made and new procedures were instituted, the manufacturer produced about 39,000 possibly defective projectiles. Some of these rounds were produced under an interim procedure authorized by a Government representative. The suspect projectiles must now be screened at a cost, estimated by one Army official, of up to $800,000. That official believes the Government is responsible for some of the cost because many of the suspect projectiles were produced under an authorized interim procedure.

CONCLUSIONS

We believe (1) it is premature to provide funding for three items until several production, technical, and operational problems are resolved, (2) funds should not be provided for eight items because inventory will exceed requirements, (3) the total amount requested should not be provided for two items because inventory will exceed requirements, and (4) funds should not be provided for four items because large quantities funded in prior years have not yet been delivered. We also believe lower cost packaging can be used for two training items.

In addition, the request for one item requires close attention because of current and potential problems. Funding for a new training item is questionable because its cost may result in the Army deleting it from future programs.

RECOMMENDATIONS

We recommend that the Committee reduce the Army's request by $464.3 million for 19 items under 13 budget lines as shown in appendix I. In addition, the Committee should closely consider the current and future impact of providing full funding for the 155-mm. improved conventional munitions on the ammunition production base. The Committee should also consider funding more tactical rounds, instead of the 155-mm. training round, because the training round's cost approximates that of the tactical round.

CHAPTER 3

NAVY AND MARINE CORPS AMMUNITION PROGRAMS

The Navy's fiscal year 1983 procurement program includes $335.4 million for Navy and $630.2 million for Marine Corps ammunition. We examined the Navy's justification for 46 items in 12 budget lines, representing $183.9 million, or 55 percent, of its ammunition request. Our examination of the Marine Corps' justification included 19 budget lines, representing $475.4 million, or 75 percent, of its ammunition request. We concluded that the Navy's request should be reduced by $24 million and the Marine Corps' request should be reduced by $62.7 million.

OTHER PROCUREMENT, NAVY APPROPRIATION

We believe the Navy's fiscal year 1983 ammunition program should be reduced by $24 million because:

--$5.7 million for five items is not needed since the inventory will exceed requirements.

--About $18.3 million for two items is premature because large quantities funded in prior years have not yet been delivered.

Inventory will exceed requirements

A total of $5.7 million of the Navy's request for the following items should not be funded because inventory will exceed requirements.

--$2.0 million for MK23 rocket motors.

--$1.3 million for MK25 marine location markers.

--$1.1 million for M18 grenades.

--$0.9 million for M127 signals.

--$0.4 million for 60-mm. mortar rounds.

MK 23 rocket motors

The $14.9 million request for jet-assisted takeoff motors includes $2 million for 442 MK23 rocket motors. These motors are not needed because the planned consumption used to determine the request is significantly higher than the consumption allocation

for fiscal years 1982, 1983, and 1984, as specified by the Chief of Naval Operations on October 7, 1981. Navy representatives said that the planned consumption used in the requirement study was based on the Chief of Naval Operations allocation of August 13, 1980, which was significantly higher than the October allocation.

After adjusting for the differences between planned consumption and the allocation specified by the Chief of Naval Operations, we found that the projected inventory after the fiscal year 1982 program would exceed the fiscal year 1983 program's needs. The projected inventory after the fiscal year 1982 program would be even larger if actual consumption was used because actual consumption during fiscal years 1979, 1980, and 1981 was lower than planned.

Navy representatives agreed that the fiscal year 1983 program is no longer needed.

MK25 marine location marker

The $6.4 million request for marine location markers includes $1.9 million for 57,200 MK25 markers. This request was based on, in part, an estimated consumption from September 30, 1981, through March 31, 1985, and assets due in from fiscal year 1982. These estimates are significantly higher than actual consumption. Further, the Navy used far fewer markers than forecasted during fiscal years 1979, 1980, and 1981.

We believe some of the requested funds are not needed because past consumption was overstated and assets due in were understated. After adjusting for the differences, we found that the Navy would need only about 18,000 marine markers to meet the fiscal year 1983 inventory objective at an estimated cost of $600,000, or $1.3 million less than the fiscal year 1983 request.

Navy representatives agreed that past consumption was lower than forecasted, but said that a lack of assets restricted use. However, our analysis disclosed that there were more than enough assets in the inventory to meet demand. We did not attempt to analyze the distribution of the inventory. Navy representatives agreed that assets due in were understated.

M18 smoke grenades

The $21.6 million request for pyrotechnic and demolition materials included $3 million for 175,000 M18 smoke grenades. If the Navy's request is approved, the inventory at the end of the fiscal year 1983 funded delivery period would exceed the total inventory objective for M18 grenades by 62,000.

Navy representatives said that they requested more than the inventory objective based on information supplied by the

Army at the time the budget was prepared. These representatives thought it was needed to achieve economic procurement quantities. However, our review disclosed that the annual minimum sustaining rate is 540,000 grenades. The fiscal year 1983 budget includes a total of 929,000 grenades for the Army, Navy, and Marine Corps, which is well above the minimum sustaining rate even with a 62,000-grenade reduction. In addition, we noted that the military services' total planned future procurements ranged from about 600,000 to 700,000 each year through fiscal year 1986. Therefore, the Navy's request in excess of the inventory objective could be deferred to future years. Navy representatives agreed that the fiscal year 1983 request for M18 grenades should be reduced by 62,000 grenades valued at $1.1 million.

M127 signals

The $21.6 million request for pyrotechnic and demolition materials also includes about $1.3 million for 60,012 M127 illuminating signals. If the Navy's request is approved, the inventory at the end of the fiscal year 1983 funded delivery period would exceed the inventory objective by 43,000 signals valued at about $900,000.

Navy representatives said that they requested more than the inventory objective based on information provided by the Army at the time the budget was prepared. They thought it was needed to achieve economic procurement quantities. However, we found that the economic order quantity is 60,000 and that the Army is requesting 90,000 signals for fiscal year 1983. Therefore, we believe it is not necessary for the Navy to exceed its inventory objective in order to obtain an economical procurement. Consequently, the request should be reduced by $900,000. Navy representatives agreed with this reduction.

60-mm. mortar rounds

The $15.5 million request for small arms ammunition includes about $1.3 million for 9,600 60-mm. high explosive mortar rounds. If the request is approved, the Navy's inventory at the end of the fiscal year 1983 funded delivery period would exceed requirements by about 3,200 rounds valued at $440,000. The Navy also ordered 3,600 mortar rounds in fiscal year 1979. These rounds should have been delivered no later than September 30, 1980; however, they were not and the Navy still does not know when it will get them. In addition, none of the 320,000 mortar rounds that the Army ordered in fiscal year 1979 or the 42,800 rounds the Marine Corps ordered in fiscal year 1980 have been delivered.

Since the Navy's projected inventory at the end of the fiscal year 1983 program would exceed requirements and in view of the undelivered program, we believe the request should be reduced by $440,000. Navy representatives agreed that the $400,000 requested for 60-mm. mortar rounds is no longer needed.

Undelivered funded programs

Because of undelivered funded programs, the Navy's request should be reduced by

--$15.8 million for MK83 bombs and

--$2.5 million for demolition charge kits.

MK83 bombs

The $18.4 million request for general purpose bombs includes a premature request of $15.8 million for 8,450 MK83 bombs. Our review of the Navy's planned production disclosed that none of the 8,450 bombs would be delivered during the funded delivery period which ends in September 1984. Furthermore, no deliveries have been made from the fiscal years 1981 and 1982 programs and the planned deliveries for these programs are now scheduled after their respective funded delivery periods.

Navy officials said that the MK83 bomb manufacturer is currently producing the MK84 bomb for the Air Force and that it would take about a year to change the production line so that MK83s could be produced. They did not know when the MK83 line would be set up. However, we noted that the Air Force's ammunition programs for fiscal years 1983 and 1984 include the MK84 bomb. Accordingly, we believe it is premature to fund the Navy's fiscal year 1983 request for MK83 bombs.

Navy representatives said that the MK84 bomb line has been shut down since February 1982 and that MK83 bomb production will start in April 1983. They expect delivery of all funded programs and the fiscal year 1983 program to be completed within the fiscal year 1983 funded delivery period. We did not have time to evaluate this information. However, the feasibility of producing 3 years' programs in a relatively short time period is questionable. Further, the impact of the MK84 bomb line shut down on the Air Force's fiscal year 1983 program must be assessed.

Demolition charge kits

The $21.6 million request for pyrotechnic and demolition material includes about $2.5 million for 1,600 demolition charge kits which should be deferred until production backlogs are eliminated. At the end of fiscal year 1981, the inventory included 2,167 serviceable kits and 3,685 kits due in from fiscal year 1982 and prior year programs. Our review disclosed that more than 2,000 kits which have been stored at the Crane Army Depot since March 1980 were not included in the Navy's fiscal year 1983 requirement computation.

At the time of our review, none of the demolition charge kits ordered in 1982 and prior years had been produced. The contractors were to deliver a preliminary quantity of 30 kits

by March 31, 1982, and first article testing was to be completed in April 1982. The contractors estimated it will take 4 months to prepare for full scale production at an anticipated rate of about 100 kits a month. Therefore, if production begins in September 1982, the current backlog of 3,685 kits would not be eliminated until about September 1985. Rather than add to the production backlog, we believe the Navy should concentrate on returning the stored kits to a ready-for-issue condition.

Navy representatives agreed that the fiscal year 1983 program is no longer needed.

PROCUREMENT, MARINE CORPS APPROPRIATION

A total of $62.7 million for six Marine Corps items is not needed for the following reasons:

--$20.9 million requested for one item (Copperhead) is premature until the Army resolves production, technical, operational, and cost growth problems.

--$36.5 million requested for two items (ADAM and RAAMS) is based on inappropriate cost estimates and is for a total quantity that cannot be produced within the normal funded delivery period.

--$4.3 million requested for three additional items is based on overstated cost estimates.

Premature procurement

The $20.9 million request for 791 Copperhead projectiles should not be funded because the Army is encountering significant production, technical, operational, and cost growth problems. While there is a definite need for this item, we believe more funds will not provide additional ordnance during the normal funded delivery period. (See pp. 5 to 9 for a detailed discussion.)

Marine Corps representatives said that the Army is resolving the problems with this round and that it should be procured in fiscal year 1983.

Undelivered quantities and overstated cost estimates

The Marine Corps requested $57.2 million for 12,711 155-mm. ADAMs and $38.1 million for 18,712 155-mm. RAAMS projectiles. Production problems with these items have caused substantial undelivered programs. (See pp. 19 to 20 for a detailed discussion.) As a result, we believe the fiscal year 1983 program should be

reduced by $25.7 million for 5,711 ADAM projectiles and by $3.5 million for 1,712 RAAMS projectiles, as suggested by the Army. We also believe that the remaining $31.5 million for ADAM and 34.6 million for RAAMS should be reduced by $2.6 million and $5.7 million, respectively, because the Marine Corps overstated the unit cost estimates in its budget submission. The Marine Corps' unit cost estimates were based on unit cost information provided by the single manager for conventional ammunition. However, we noted that the estimates were $370 higher for the ADAM and $336 higher for the RAAMS than Army estimates.

According to service officials, after reviewing the services' budgets, the Office of the Secretary of Defense directed them to use a lower inflation factor, delete first destination transportation from each budget line, and hold quantities constant. This, of course, decreased unit costs, and unit costs for Army items are lower in the President's budget than in the Army's original submission. However, the Army's unit costs for several items were not used by the Marine Corps because the Marine Corps adjusted costs for items under the conventional ammunition working capital fund. As a result, unit costs were not only overstated for the ADAM and RAAMS projectiles, but for three additional items we reviewed as shown in the following table:

Item	Unit cost (note a) Marine Corps	Army	Difference	Marine Corps quantity	Overstated amount
60-mm., HE, LWCMS	$ 137	$ 126	$11	26,195	$ 288,145
155-mm., Smoke, HC-BE	566	519	47	27,220	1,279,340
8-inch, HE, ICM, DP	1,247	1,184	63	42,827	2,698,101
Total					$4,265,586

a/Rounded to nearest dollar.

The Army adjusted its unit costs for these items because even though they are not directly under the conventional ammunition working capital fund, they are influenced by the fund since common components will be procured through the fund.

Marine Corps representatives said that the ADAM program can be reduced by 911 projectiles and the RAAMS program by 1,712 projectiles. However, they attribute this quantity reduction to increased unit costs rather than to production backlogs. While there may be an increase in unit costs, at least part of it is attributable to the Marine Corps' decision to have the Army produce the fiscal year 1983 program in an uneconomical manner. We noted that the Army is reducing both the program quantities and

dollars for these items. We believe the backlog should be eliminated, as suggested by the Army, and the programs reduced accordingly. The Marine Corps should not require the Army to produce the items in an uneconomical manner simply because it wants the items in the fiscal year 1983 program. Optimum production should be considered in the procurement decision.

Marine Corps representatives said that they did not adjust the cost of items not covered by the conventional ammunition working capital fund because the program budget decision limited adjustments to items covered by the fund. We believe the Army used the right approach since some items not directly under the fund will be influenced by the fund. In any event, the services should be requesting like funding for like items.

CONCLUSIONS

We believe that (1) amounts requested for five items are greater than needed, (2) funding five additional items, including three Marine Corps items, is premature, and (3) unit costs for five items in the Marine Corps request were overstated. The Marine Corps' request is about twice the fiscal year 1982 program and the projected fiscal year 1984 program. Such programming could result in an undesirable hump in the production curve or increase the production backlog--or both--for several items.

RECOMMENDATIONS

We recommend that the Committee reduce the Navy's fiscal year 1983 ammunition appropriation request by $24 million for the seven items shown in appendix II and the Marine Corps' fiscal year 1983 ammunition appropriation request by $62.7 million for six items as shown in appendix III.

Some of the reductions are partially attributable to the Navy and Marine Corps acting on questionable Army information. Therefore, the Committee should consider allowing the Navy and Marine Corps to substitute items for those deleted.

CHAPTER 4

AIR FORCE AMMUNITION PROGRAM

The Air Force's fiscal year 1983 appropriation request for ammunition was $845.6 million. We examined the Air Force's justification for 19 of the 48 items, representing $702.5 million, or 83 percent, of the request and concluded that the request should be reduced by $74.1 million for the following reasons:

--The $54.4 million requested for the CBU-90/B antiarmor cluster munition is not needed because of significant problems in the development program.

--The $52.5 million requested for the M-206 infrared cartridge flare should be reduced $13.8 million because a better price is available.

--The $29.4 million requested for the BDU-33 practice bomb should be reduced $5 million because more recent consumption forecasts decreased requirements.

--The $12.2 million requested for the BSU-50 inflatable retarder should be reduced $0.9 million because the last month's production extends beyond the fiscal year 1983 funded delivery period.

CLUSTER BOMB UNIT (CBU)-90/B ANTIARMOR CLUSTER MUNITION

The CBU-90/B antiarmor cluster munition is a developmental weapon that consists of 48 BLU-99/B submunitions contained in an SUU-65/B tactical munitions dispenser. The request includes $54.4 million for the initial production of 2,000 rounds. However, our review disclosed significant developmental problems which should be corrected before production begins. In fact, the Air Force is currently evaluating the entire program.

Weapon development problems

Technical weapon problems are associated with both the submunitions and the entire weapon system. Submunition problems included fuze failures, bending de-spin vanes, breaking chute boxes, and inverting chutes. System problems included interference of the dispenser panels with the submunitions when the dispenser opens and submunition high explosive blasts, affecting the orientation of other descending submunitions.

Six inert rounds and one live round had been tested as of February 9, 1982. Only 7 of the 48 submunitions functioned in the first round tested and, in subsequent rounds, 23 to 33 functioned in accordance with specifications. The malfunctions in the first five tests were primarily associated with fuze problems. Malfunctions in the last two tests were primarily associated with quality problems, such as poorly soldered electrical connections and improperly installed detonators. On the basis of the last two tests, Air Force officials believe that the fuze problem is solved.

Air Force officials stated that three additional tests of the munitions are planned before a critical design review in July 1982. Results of these tests will be used to determine if 170 rounds should be produced for developmental testing and evaluation and initial operational testing and evaluation. Our review disclosed that these tests and evaluations are not planned to begin until September 1982 and that the scheduled completion date has slipped from November 1982 to about September 1983. Present plans are to award the fiscal year 1983 initial production contract in February 1983, less than half way through the testing period. Only about 60 of the 170 rounds will be tested by then.

In addition, we found that the Air Force is seriously considering canceling the entire antiarmor cluster munition program. Air Force officials testified before the Senate Committee on Armed Services in March 1982 that the Air Force was reevaluating its antiarmor mission area and that a decision was expected in September 1982.

Production facility problems

Production facilities for antiarmor cluster munitions are being developed by the Army and include initial and expanded facilities to produce both the submunition and the dispenser, as well as a LAP facility. All of the facilities were scheduled to be completed by February 1984, but the current scheduled completion dates are July 1984 for the dispenser facility, August 1984 for the LAP initial production facility, and May 1985 for the LAP-expanded facility and the submunition production facility.

The Air Force's plans show initial deliveries to begin with 20 rounds in September 1984 and a gradual increase to 325 rounds in August 1985, the final month. The Army project engineer said that initial submunition production will start in September 1984, even though the facility will not be completed until May 1985. The scheduled September 1984 production is 960 units, enough for 20 rounds. However, it is unlikely that the initial delivery date for completed rounds will be met since submunition production is not scheduled to start until September 1984 and additional time will be needed for shipping the submunitions to the LAP facility

and for the LAP effort before delivery of complete rounds. Enough submunitions for 20 rounds a month could be made available from production for developmental and operational testing and evaluation and used to meet the first 2 months deliveries for complete rounds. Since the delivery schedule for completed rounds begins to increase in November 1984, the submunitions' initial production facility will be needed to meet the increased deliveries.

Based on the delays already experienced in completing the submunition production facility and the questionable starting of production 8 months prior to completion of the facility, it is doubtful that sufficient quantities of submunitions can be produced to meet the delivery schedule for completed antiarmor cluster munition rounds.

M206 INFRARED CARTRIDGE FLARE

This $52.5 million request is for 3 million M206 flares and M796 impulse cartridges, at an average unit cost of $17.50. The request should be reduced by about $13.8 million because the M206 flares can be obtained at a lower unit cost than estimated in the budget.

The fiscal year 1979 program was divided between the Longhorn AAP and a commercial source. The commercial source's flares failed six first article tests resulting in undelivered quantities totaling 244,000 before they finally passed in December 1981. The fiscal year 1980 program was canceled and the fiscal year 1981 program is being produced ahead of schedule by the Longhorn AAP.

The fiscal year 1982 program will be produced by both Longhorn AAP and commercial sources. According to the Air Force item manager, bids for the fiscal year 1982 program from commercial sources were for $7.00 and $7.80. For the fiscal year 1983 program, the Army's single manager for conventional ammunition plans to award 600,000 flares to Longhorn AAP and 2.4 million flares to commercial sources.

The Longhorn AAP's estimated unit cost for the fiscal year 1983 program is $23.20. On the basis of bids received from commercial sources for the fiscal year 1982 program, Army procurement representatives estimated that the fiscal year 1983 M206 flare program could be produced commercially for $9.00 a flare. This would result in a total program cost of about $38.7 million, as shown in the table on the following page, or $13.8 million less than the budget request.

Item	Source	Quantity	Cost	
			Unit	Total
				(millions)
M206 flare	Commercial	2,400,000	$ 9.00	$21.6
M206 flare	Longhorn AAP	600,000	23.20	13.9
M796 cartridge	Commercial	3,000,000	1.07	3.2
Total				$38.7

Army representatives agreed with our findings, and Air Force representatives were agreeable to the reduction if the requested quantity can be procured at the lower cost.

BDU-33 PRACTICE BOMB

The request of $29.4 million for 1,568,840 bombs should be reduced by about $5 million because more recent consumption forecasts have reduced total needs.

Our review of recent consumption data initially disclosed about a 444,000-bomb reduction, costing $8.3 million, as summarized in the following table.

Period	Forecasted consumption		
	Per budget request	As of 12/31/81 (note a)	Difference
July 1981 - Sept. 1983	3,471,089	2,840,180	-630,909
Oct. 1983 - Sept. 1984	1,156,480	1,343,576	187,096
Total	4,627,569	4,183,756	-443,813

a/Includes 6 months' actual consumption.

Air Force representatives said that the latest data indicate the fiscal year 1983 program exceeds requirements by 289,024 bombs valued at $5 million. However, they prefer to retain the entire fiscal year 1983 program as insurance against an increase in requirements.

Although we did not verify the Air Force's computation, we believe it should be used instead of our data since it was based on more current information. However, we also believe the program should be reduced to the level actually required because the

Air Force has no assurance that the requirements will not decrease further rather than increase.

BSU-50 AIR INFLATABLE RETARDER

The request includes $12.2 million for 7,300 BSU-50 air inflatable retarders used with 2,000-pound general purpose bombs. The request should be reduced $0.9 million because the scheduled delivery extends beyond the fiscal year 1983 funded delivery period.

The production schedule for the BSU-50 shows initial delivery of 100 in November 1983 and 600 a month from December 1983 through November 1984. Since the end of the fiscal year 1983 funded delivery period for this item is October 1984, the November 1984 production of 600 retarders should be funded in fiscal year 1984 rather than fiscal year 1983.

Air Force representatives said that the anticipated fiscal year 1984 leadtime will be 14 months and that planned deliveries in November will most likely change. Our review did not disclose any indication of such changes.

CONCLUSIONS

We believe the Committee should reduce the Air Force's request because:

--None of the request for antiarmor cluster munitions is needed due to significant development problems.

--Part of the request for M-206 cartridge flares is not needed because they can be procured at a lower price.

--Part of the request for BDU-33 practice bombs is not needed due to reduced requirements.

--Part of the amount requested for BSU-50 retarders is premature.

RECOMMENDATIONS

We recommend that the Committee reduce the Air Force's ammunition appropriation request by $74.1 million for four items as shown in appendix IV.

CHAPTER 5

AMMUNITION PLANT MODERNIZATION AND EXPANSION PROGRAM

The Army's fiscal year 1983 request included $433.4 million for production base support, of which $358.2 million was for 41 projects to modernize and expand the ammunition production base. (See app. V.) The Army plans to use the modernization and expansion funds for a wide variety of projects, such as

--establishing initial production facilities for 120-mm. ammunition for use in the M1E1 tank;

--establishing a facility in private industry to produce a binary round chemical component;

--meeting a shortfall in completing the Mississippi AAP;

--completing production lines for 5.56-mm. ammunition built under a small caliber ammunition modernization program;

--installing an electrical powerline at the Indiana AAP;

--correcting deficiencies in several existing facilities, such as ammonia oxidation plants at the Holston AAP and Sunflower AAP and TNT lines at the Volunteer AAP; and

--providing omnibus engineering funds for process equipment and construction designs.

Because of time constraints, we limited our review to seven modernization and expansion projects representing $40.6 million, or 9 percent, of the total production base support request. We concluded that the requests for two projects should be reduced by $15.5 million.

PROJECT 5832210

This $4.8 million project is to procure equipment developed or to be developed under the Army's manufacturing methods and technology program for loading M42/M46 grenades into the M483A1, 155-mm. improved conventional munitions projectiles. The equipment will be installed at the Kansas and Lone Star AAPs. The Army plans to procure 11 insertion machines and 5 machines that prepare grenades in layers for the insertion machines. In our opinion, funding these additional machines at this time is premature because

--the prototype grenade clustering machine has not yet been developed and

--the prototype grenade insertion machines have not yet been tested in a production environment.

Grenade clustering machine

The manufacturing methods and technology project funded to develop a grenade clustering machine to prepare live grenades for loading into the M483A1 projectile were unsuccessful. The existing method is labor intensive and automated equipment was intended to reduce the number of people on the production line and to lessen the danger when loading live grenades. The Kansas AAP's operating contractor developed a new design for the machine. However, the Army has not yet built prototype equipment to demonstrate the design's feasibility.

Grenade insertion machine

The automated insertion machine, developed by private industry, was scheduled for shipment to the Kansas AAP in March 1982 for production environment testing. The machine will load layers of eight grenades into the M483A1 projectile. The machine also assures that a slide mechanism has not operated, allowing a grenade to arm. This inspection function was designed into the machine before a simple slider clip lock was developed. When the clip lock is placed in the machine there is almost a 100-percent assurance that a grenade will not go off during insertion. Although the clip lock eliminates the need for the inspection function, it infringes on the spacing tolerance between the grenade and the insertion equipment. Therefore, a newer, more sophisticated clip lock is being considered. If a new clip lock is developed, the interface between it and the insertion equipment would have to be evaluated before approval.

The insertion machine with the slider clip lock in place has been tested with inert grenades. However, before any additional machines are procured, production environment testing should be completed to ensure that the machine

--properly interfaces with other production equipment on the line,

--properly performs the required inspection functions and does not interfere with the slider lock clip, and

--is reliable and maintainable under continuous operation.

Further, according to the operating contractor at the Kansas AAP, inserting live grenades in a production environment could reveal significant differences over a simulated production environment using inert grenades.

Army representatives agreed with our findings and that funds were not needed. They said that at the time of the budget review

the Army anticipated the manufacturing methods and technology project would provide a grenade clustering machine.

PROJECT 5830048

This $10.7 million project is for expanding the production facilities for the Air Force's CBU-90/B antiarmor cluster munition. In fiscal year 1982 about $21 million was approved for the initial production facility.

On pages 35 to 37, we stated that the CBU-90/B program was experiencing weapon development and production facility problems and that the Air Force may cancel the entire program. Consequently, the need for funding the fiscal year 1983 facility program is questionable.

Army representatives said that the Air Force lifted its hold on the development of this item in April 1982 and that the Air Force will decide in September 1982 if the program should continue beyond September. They also said that the need for this project is contingent on Air Force and congressional actions on the budget request for the CBU-90/B.

CONCLUSIONS

Project 5832210 is not ready for funding in fiscal year 1983 because (1) the prototype insertion equipment has not been tested in a production environment and (2) a prototype clustering machine has not yet been developed. Project 5830048 should be deleted because of development problems and a possible cancellation of the program.

RECOMMENDATIONS

We recommend that the Committee

--defer the $4.8 million request for the automated grenade loading facilities until prototype equipment is fully developed and tested and

--delete the $10.7 million request for the antiarmor cluster munition facility.

APPENDIX I

GAO-RECOMMENDED ADJUSTMENTS TO THE ARMY'S AMMUNITION REQUEST (note a)

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
4	Cartridge, 5.56-mm., all types	$ 70.0	$ -0.8	$ 69.2	Less expensive packaging for blank round. (See p. 23.)
5	Cartridge, 7.62-mm., all types	52.7	-7.4	45.3	Less expensive packaging for blank round. (See p. 23.) Inventory will exceed requirements for ball linked cartridge. (See p. 12.)
6	Cartridge, .22 cal., all types	1.2	-	1.2	No comment.
7	Cartridge, .45 cal., all types	4.6	-	4.6	No comment.
9	Cartridge, .50 cal., all types	93.6	-24.7	68.9	Inventory will exceed requirements for ball and tracer and armor piercing incendiary cartridges. (See p. 16.)
10	Cartridge, 14.5-mm., with fuze, all types	1.8	-1.8	-	Inventory will exceed requirements for all three types. (See p. 13.)
11	Cartridge, 20-mm., all types	21.1	-0.9	20.2	Target practice ball cartridge inventory will exceed requirements. (See p. 14.)
12	Cartridge, 30-mm., all types	64.1	-55.1	9.0	Tactical round funded quantities exceed requirements and weapon system problems exist. (See p. 9.)

APPENDIX I

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
14	Cartridge, 40-mm., DIVADS, all types	$ 70.9	$-22.0	$ 48.9	Propellant for proximity fuzed round is not available and technology transfer problems exist. (See p. 10.)
15	Cartridge, 40-mm., conventional, all types	10.1	-	10.1	No comment.
17	Cartridge, 81-mm., conventional, all types	25.6	-	25.6	No comment.
19	Cartridge, 4.2-inch, all types	55.3	-55.3	-	Illuminating cartridge inventory will exceed requirements. Undelivered program can be extended on high explosive round. (See pp. 15 and 21.)
20	Cartridge, 105-mm., HEAT/TP all types	53.3	-	53.3	Requires special attention. (See p. 26.)
21	Cartridge, 105-mm., APFSDS-T/TP,	154.8	-54.5	100.3	Inventory will exceed requirements for training round. (See p. 17.)
23	Projectile, 155-mm., conventional, all types	37.7	-	37.7	Training round requires special attention. (See p. 25.)
24	Projectile, 155-mm., HE, ICM	237.3	-	237.3	Requires special attention. (See p. 24.)

APPENDIX I

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
25	Projectile, 155-mm., HE RAP	$ 17.7	$ -	$ 17.7	No comment.
26	Projectile, 155-mm., ADAM/RAAMS	156.5	-47.7	108.8	Production problems exist on both rounds. (See p. 19.)
27	Projectile, 155-mm., HE Copperhead	183.6	-183.6	-	Technical deficiencies and production problems exist. (See p. 5.)
28	Projectile, 155-mm., WP smoke, screening	16.1	-	16.1	No comment.
30	Charge, propelling, all types	89.9	-	89.9	No comment.
31	Projectile, 8-inch, HE, ICM	104.2	-	104.2	No comment.
32	Projectile, 8-inch, HE, RAP	44.9	-	44.9	No comment.
33	Fuze, all types	108.0	-9.4	98.6	Point detonating fuze undelivered funded program can be extended. (See p. 22.)
37	Demolition munitions	16.4	-	16.4	No comment.
41	Hand grenades, all types	12.5	-1.1	11.4	Inventory will exceed requirements for violet smoke grenade. (See p. 16.)

APPENDIX I

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----- (millions) -----			
43	Signals, all types	$ 15.5	$ -	$ 15.5	No comment.
44	Simulators, all types	10.4	-	10.4	No comment.
46	Items less than $900,000	14.5	-	14.5	No comment.
	Total (note b)	$1,744.3	$-464.3	$1,280.0	
	Total (note c)	461.3	-	461.3	
Total		$2,205.6	$-464.3	$1,741.3	

a/Appropriation: Procurement of Ammunition, Army 21(07-15) 2034, Subfunction 051.

a/Total requested for these budget lines. GAO reviewed requests for ammunition end items totaling $1,620.4 million under these budget lines.

b/Total for budget lines not reviewed by GAO.

GAO-RECOMMENDED ADJUSTMENTS

TO THE NAVY'S AMMUNITION REQUEST (note a)

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
218	General purpose bombs	$ 18.4	$-15.8	$ 2.6	MK83 bomb undelivered program. (See p. 31.)
221	Zuni rocket	7.5	-	7.5	No comment.
222	2.75-inch rocket	10.5	-	10.5	No comment.
224	Machine gun ammunition	19.6	-	19.6	No comment.
225	Practice bombs	26.5	-	26.5	No comment.
229	Marine location markers	6.4	-1.3	5.1	MK25 marker inventory will exceed requirements. (See p. 29.)
232	Jet-assisted take off	14.9	-2.0	12.9	MK23 motor inventory will exceed requirements. (See p. 28.)
257	5 inch/54 caliber ammunition	28.0	-	28.0	No comment.
258	CIWS ammunition	20.4	-	20.4	No comment.
259	76-mm., ammunition	34.6	-	34.6	No comment.
287	Small arms ammunition	15.5	-0.4	15.1	60-mm. LWCMS inventory will exceed requirements. (See p. 30.)
288	Pyrotechnic and demolition material	21.6	-4.5	17.1	M18 grenade and M127 signal inventories will exceed requirements. (See pp. 29 to 30.) Demolition charge kit undelivered program. (See p. 31.)
	Total (note b)	223.9	-24.0	199.9	
	Total (note c)	111.5	-	111.5	
	Total	$335.4	$-24.0	$311.4	

a/Appropriation: Other Procurement, Navy 17(07-15) 1810, Subfunction 051.

b/GAO reviewed 82 percent of the amounts requested for the listed items ($183 million).

c/Total for items in budget lines not reviewed by GAO.

GAO-RECOMMENDED ADJUSTMENTS

TO THE MARINE CORPS' AMMUNITION REQUEST (note a)

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
1	Linear charge, HE, C4	$ 16.3	$ -	$ 16.3	No comment.
5	Cartridge, 5.56-mm., linked 4/1 (SAW)	8.1	-	8.1	No comment.
7	Cartridge, 5.56-mm., ball	16.5	-	16.5	No comment.
10	Cartridge, 5.56-mm., ball XM855	17.5	-	17.5	No comment.
14	Cartridge, 60-mm., HE, LWCMS	3.6	-0.3	3.3	Overstated cost estimate. (See p. 33.)
18	Projectile, 155-mm., smoke, HC-BE	15.4	-1.3	14.1	Overstated cost estimate. (See p. 33.)
19	Projectile, 155-mm., HE, ICM, DP	131.7	-	131.7	Requires special attention. (See p. 24.)
20	Charge propelling, 155-mm., white bag	50.9	-	50.9	No comment.
22	Projectile, 155-mm., illuminating	16.1	-	16.1	No comment.
25	Grenade, smoke, screening	1.7	-	1.7	No comment.
31	Rocket, HEAT, 70-mm., Viper	9.2	-	9.2	No comment.
33	Charge, propelling, 8-inch, white bag	11.3	-	11.3	No comment.
34	Cartridge, 105-mm., TK, WP-T	1.3	-	1.3	No comment.
37	Cartridge, 105-mm., DS-TP	4.6	-	4.6	No comment.

APPENDIX III

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
38	Cartridge, 105-mm., TP-T	$ 1.6	$ -	$ 1.6	No comment.
40	Projectile, 155-mm., ADAM	57.2	-28.3	28.9	Production backlog and overstated cost estimate. (See p. 32.)
41	Projectile, 155-mm., RAAMS	38.1	-9.2	28.9	Production backlog and overstated cost estimate (See p. 32.)
42	Projectile, 8-inch HE, ICM, DP	53.4	-2.7	50.7	Overstated cost estimate. See p. 33.)
43	Projectile, 155-mm., CLGP Copperhead	20.9	-20.9	-	Production, technical, and cost growth problems. (See p. 32.)
	Total	475.4	-62.7	412.7	
	Total (note b)	154.8	-	154.8	
Total		$630.2	$-62.7	$567.5	

a/Appropriation: Procurement, Marine Corps 17(07-15) 1109, Subfunction, 051.

b/Total for items in budget lines not reviewed by GAO.

GAO-RECOMMENDED ADJUSTMENTS TO THE

AIR FORCE'S AMMUNITION REQUEST (note a)

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
7	Cartridge, 20-mm., training	$ 1.1	$ -	$ 1.1	No comment.
8	Cartridge, 30-mm., training	84.9	-	84.9	No comment.
9	Cartridge, 30-mm., HEI	24.4	-	24.4	No comment.
10	Cartridge, 30-mm., API	65.6	-	65.6	No comment.
15	Cartridge, chaff RR-170	4.7	-	4.7	No comment.
19	Cartridge, MXU-4A/A engine starter	10.4	-	10.4	No comment.
23	MK-82 bomb, empty	32.2	-	32.2	No comment.
24	Airfield attack weapon	9.2	-	9.2	No comment.
25	BSU-49 inflatable retarder	52.2	-	52.2	No comment.
26	BSU-50 inflatable retarder	12.2	-0.9	11.3	Premature buy and requires special attention. (See p. 39.)
28	Laser bomb guidance kit	176.4	-	176.4	No comment.
29	GBU-15 guided weapon	47.3	-	47.3	No comment.
30	Bomb, practice BDU-33	29.4	-5.0	24.4	Changes in forecasted consumption. (See p. 38.)

APPENDIX IV

Budget line number	Item description	Budget request	Recommended adjustments	Adjusted request	Remarks
		----------(millions)----------			
34	CBU-89, TMD/GATOR	$ 20.5	$ -	$20.5	No comment.
36	CBU-90, ACM	54.4	-54.4	-	Production facilities are not ready, testing has identified significant problem, and testing completion delays. (See p. 35.)
39	Aerial tow target	7.5	-	7.5	No comment.
42	Flare, IR MJU-7B	9.3	-	9.3	No comment.
46	Flare, IR M206 Cartridge	52.5	-13.8	38.7	Overstated cost estimate. (See p. 37.)
56	Fuze, FMU 112/ FMU 139	8.3	-	8.3	No comment.
	Total	702.5	-74.1	628.4	
	Total (note b)	143.1	-	143.1	
Total		$845.6	$-74.1	$771.5	

a/Appropriation: Other Procurement, Air Force 57(07-15) 3080, Subfunction 051.

b/Total of conventional ammunition items, miscellaneous items, and nuclear items not reviewed by GAO.

GAO-RECOMMENDED ADJUSTMENTS TO THE ARMY'S

MODERNIZATION AND EXPANSION PROGRAM REQUEST (note a)

Project number	Description	Budget request	Recommended adjustments	Adjusted request
		----------(millions)----------		
Projects reviewed by GAO				
5830048	Expansion of production facilities for an Air Force antiarmor cluster munition in commercial industry	$ 10.67	$-10.67	b/-
5830050	Expansion of production facilities for an Air Force tactical munition dispenser in commerical industry	1.91	-	1.91
5832066	Construction of an electrical power tieline at Indiana AAP	3.60	-	3.60
5832127	Correct deficiencies on modernized TNT lines at Volunteer AAP	8.15	-	8.15
5832201	Complete SCAMP line 3 at Lake City AAP	4.05	-	4.05
5832210	Automatic clustering and insertion equipment to load M42/46 grenades	4.83	-4.83	c/-
5833605	Construction of a consolidated operations center at Kansas AAP	7.35	-	7.35
	Total	40.56	-15.50	25.06
	Total not reviewed	317.64	-	317.64
Total		$358.20	$-15.50	$342.70

a/Appropriation: Procurement of Ammunition, Army 21 (07-15) 2034, Subfunction 051.

b/Program is experiencing weapon development problems. (See p. 42.)

c/Prototype equipment must be fully developed and tested. (See p. 40.)

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