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ANTIARMOR WEAPONS ACQUISITIONS

Assessments Needed to Support Continued Need and Long-Term Affordability





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

National Security and
International Affairs Division

B-248672

March 4, 1993

The Honorable Les Aspin
The Secretary of Defense

Dear Mr. Secretary:

This report examines the process the Department of Defense uses to justify and acquire weapons with an antiarmor capability. It contains recommendations to you.

The head of a federal agency is required under 31 U.S.C. 720 to submit a written statement on actions taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report. A written statement must also be submitted to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the Chairmen and Ranking Minority Members of the above Committees and the House and Senate Committees on Armed Services; the Secretary of the Army; and the Director of the Office of Management and Budget. We will also make copies available to others upon request.

This report was prepared under the direction of Henry L. Hinton, Jr. He can be reached at (202) 275-6152 if you or your staff have any questions concerning this report. Other major contributors to this report are listed in appendix I.

Sincerely yours,

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

Antiarmor weapons are a critical part of U.S. military warfighting capability. The Office of the Secretary of Defense (OSD) estimates that in the fiscal year 1993 budget the services requested about \$1 billion for the acquisition of new antiarmor weapons. For the last 40 years, the major focus of U.S. defense planning has been the threat of a massive Soviet land attack in Europe where antiarmor weapons had a principal role. Since 1989, however, the former Soviet threat has diminished. U.S. officials now believe the most serious threat to U.S. interests is the potential for regional conflicts worldwide.

GAO reviewed the process the Department of Defense (DOD) uses to justify the need for new antiarmor weapon systems acquisitions. GAO's objectives were to determine if DOD's acquisition process evaluates whether the services are acquiring only those weapon systems that (1) are needed to defeat the threat, (2) do not duplicate current capabilities, and (3) are affordable.

Background

The Army, the Air Force, and the Marine Corps all have missions to destroy or suppress enemy armor and each is developing, acquiring, or has fielded weapons with antiarmor capabilities. Although the Navy does not have a direct antiarmor mission, it also has procured weapon systems with antiarmor capabilities. The services' universe of weapon systems with antiarmor capability includes both air- and ground-launched munitions, such as the Sensor Fuzed Weapon and the Sense and Destroy Armor munition. The Office of the Secretary of Defense has identified at least 33 weapon systems with an antiarmor capability: 16 currently fielded systems, 7 systems scheduled to be fielded before 1996, and 10 systems scheduled to be fielded after 1996. The Army has the largest number of weapon systems with an antiarmor capability.¹

In February 1991, OSD issued revised acquisition regulations—the DOD 5000 series—to establish a single, standardized, DOD-wide system for defense acquisitions. These revised regulations require the services to (1) analyze warfighting needs based on current and projected future threats, (2) assess the cost and operational effectiveness of alternative capabilities, and (3) assess the long-term affordability of acquisition programs. The services are to update their analyses, as necessary, at the various review milestones throughout the acquisition process. Outside of the structured acquisition review process, the services are to reexamine the need for new

¹As used in this report, antiarmor weapon systems include all systems with the capability to defeat threat armor, although DOD may have assigned the system another primary mission or role.

acquisitions when making funding decisions during the annual budgeting process.

Results in Brief

Since the Soviet threat has diminished, DOD has not conducted sufficient analyses of its antiarmor needs and alternative capabilities to meet mission requirements. DOD's acquisition regulations provide guidance for preparing the needed analyses at key milestone decision points. However, many of the systems have not had a milestone review since the threat changed. Generally, the services' latest detailed analyses supporting the need for current acquisitions were based on the need to defeat the previous threat—the Soviet and Warsaw Pact. According to OSD, the services consider the changes in threat and conduct informal analyses and special studies of the continued need for antiarmor acquisitions during annual budget reviews. These budget reviews, however, do not generally include analyses as are required for major milestones.

GAO's review of analyses prepared for milestone decision points since the 1991 revision to the DOD acquisition regulations disclosed that the services generally have not assessed whether their needs could be met by weapon systems with other missions or from other services. In addition, the services, although required to, have not assessed the affordability of major acquisitions through the end of procurement. This occurred, in part, because OSD has not issued supplementing instructions and procedures for conducting these reviews. Without these assessments, OSD and the services do not have reasonable assurances that the systems to be acquired are needed and affordable through the life of the program.

Principal Findings

Analyses Supporting Need Not Updated Since Threat Changed

Although the threat has changed, the services generally do not conduct detailed analyses to reassess warfighting needs until an acquisition program transitions to the next phase of acquisition. Each acquisition phase, such as engineering and manufacturing development, can take years. Officials stated that they consider the need to compare new acquisitions against the changed threat as part of the services' annual budgeting process. However, these officials also stated that budget decisions are not based on analyses with the rigor and depth required by

the acquisition regulations for milestone reviews, and the basis for decisions is not generally documented.

In addition, in response to the significant changes in threat, the Army and the Air Force are revising their doctrine. Set forth in August 1991, the emerging doctrine stresses the need for increased lethality, range, and long-range fires. It also emphasizes the need to project combat power from the continental United States using a smaller force. However, DOD's analyses supporting antiarmor acquisitions generally have not considered weapon systems' deployability.

**Analyses Supporting
Antiarmor Acquisitions
Often Limited to Single
Service or Mission**

Army and Air Force documentation and analyses, some prepared prior to the current regulations, but still used to justify current acquisitions, indicate that these services generally did not assess other services' weapon systems as required by the revised DOD 5000 regulations. For example, OSD and the services use cost and operational effectiveness analyses to trade off the capabilities and costs of weapon systems. However, GAO's review disclosed that all six cost and operational effectiveness analyses for major antiarmor acquisitions conducted from 1989 to 1991 only compared alternative capabilities from a single service or mission. In recognition of the changed threat environment and to establish the continued need for and priority among antiarmor alternatives, OSD is planning a 2-year study of the antiarmor mission. However, it is currently not funded.

The Joint Requirements Oversight Council is the DOD advisory group responsible for reviewing the need and requirements for major defense acquisition programs based, in part, on briefings provided by the services. As part of its review process, the Council is chartered to emphasize limiting redundant capabilities. However, as of March 1992, none of the services' five briefings to the Council on major antiarmor acquisitions provided an assessment of alternative capabilities in other services and missions. In July 1992, the Council revised its briefing guide to the services calling for an expanded assessment of alternative capabilities to justify new acquisitions. In September 1992, to minimize unnecessary duplication, the Council issued a policy memorandum requiring the services to cooperate and coordinate needs and requirements. The Council, however, has not specifically asked the services to compare capabilities from other related mission areas.

Long-Term Affordability of Acquisitions Not Fully Considered

Since August 1991, the DOD 5000 series regulations have required the services to prepare assessments of the long-term affordability of major weapons programs through the end of procurement. However, OSD has not established formal procedures to implement and enforce the regulations. In the interim, the Offices of the Deputy Secretary of Defense and Under Secretary of Defense for Acquisition require that all major programs undergoing review must either show funding in the approved 6-year budget plan or identify reductions in other programs to provide the required funding. However, this interim requirement does not require that the services demonstrate a program's affordability through the end of its procurement, as required by the regulations.

Recommendations

GAO recommends that the Secretary of Defense:

- Assess the continued need for the antiarmor acquisitions currently planned in light of the significant changes in threat.
- Ensure that the services are not acquiring antiarmor systems that unnecessarily duplicate existing capabilities because they did not adequately consider alternatives in other services.
- Require that the services comply with the regulations to conduct assessments of the long-term affordability of antiarmor acquisitions as required by the DOD 5000 regulations.

Agency Comments

GAO provided a draft of this report to DOD, but did not obtain fully coordinated comments from the Department. However, GAO discussed a draft of this report with officials from the Office of the Under Secretary of Defense for Acquisition; the Office of the Assistant Secretary of Defense for Program Analysis and Evaluation; the Office of the Joint Chiefs of Staff; the Office of the Assistant Secretary of the Army for Research, Development and Acquisition; the Army's Office of the Deputy Chief of Staff for Operations and Plans; the Air Force's Office of the Assistant Secretary; and the Marine Corps' Combat Development Command. They generally agreed with GAO's findings and recommendations. GAO has incorporated their comments and suggestions in the report where appropriate.

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Abbreviations

DOD	Department of Defense
GAO	General Accounting Office
OSD	Office of the Secretary of Defense
TOW	Tube-launched, Optically-tracked, Wire-guided

Introduction

The threat has historically been a determining factor in the Department of Defense's (DOD) acquisition of weapon systems. In response to the Soviet¹ armor threat, DOD developed and procured a broad range of weapon systems with antiarmor capabilities. Currently, DOD has weapon systems in early technical development (called technology base by DOD), acquisition, production, or inventory with the capability to defeat enemy armored vehicles. Armored vehicles include tanks, armored personnel carriers, infantry fighting vehicles, and self-propelled artillery. Of these vehicles, tanks are the most difficult to defeat.

In early 1991, DOD revised its DOD 5000 series regulations governing defense acquisitions. A primary purpose of these revisions was to establish a standardized, DOD-wide acquisition system that would strengthen the link between requirements, acquisitions, and funding.

Antiarmor Weapon Systems

The Army, Air Force, and Marine Corps each have missions that require them to have weapons with the capability to destroy or suppress enemy armored vehicles. All are developing, acquiring, or have fielded weapon systems with an antiarmor capability to perform their assigned missions. The Office of the Secretary of Defense (OSD) has identified at least 33 weapon systems with an antiarmor capability: 16 currently fielded systems, 7 systems scheduled to be fielded before 1996, and 10 systems scheduled to be fielded after 1996. OSD estimates that in the fiscal year 1993 budget the services requested about \$1 billion for the acquisition of new antiarmor weapons. The Army, as the primary ground force, has the largest number of antiarmor weapon systems. The Marine Corps' antiarmor needs parallel the Army's, and it acquires virtually all of its antiarmor weapons through the Army. The Air Force acquires antiarmor weapons, such as air-droppable munitions. Although the Navy does not have a direct antiarmor mission, it also has procured weapon systems with antiarmor capabilities.

Table 1.1 lists the weapon systems currently fielded or in development with the capability to defeat enemy armor. Some systems are planned as replacements for other systems; for example, the Javelin antitank weapon (formerly the Advanced Antitank Weapon System-Medium) is to replace the Dragon II antitank weapon. Other systems, such as the Line-of-Sight Antitank System, have been returned to the early technical development stage.

¹On December 21, 1991, the Union of Soviet Socialist Republics—the Soviet Union—was dismantled when the former Soviet states signed a declaration to establish the Commonwealth of Independent States.

**Chapter 1
Introduction**

Table 1.1: Antiarmor Capable Weapon Systems by Type and Projected Fielding Date

Weapon type	Currently fielded	Planned fielding	
		Prior to 1996	After 1996
Maneuver Infantry weapons			
Multipurpose	M72A2/3 Light Antitank Weapon AT-4 Antiarmor Weapon		Bunker Defeat Munition
Antitank	Shoulder-launched, Multipurpose, Assault Weapon with high explosive antiarmor cartridges		Short-range Antitank Weapon
Manportable antitank guided missile (medium)	Dragon II weapon	Javelin weapon	
Vehicles			
Crew-served, vehicle-mounted antitank guided missile	Tube-launched, Optically-tracked, Wire-guided (TOW) missile (TOW-2A to defeat reactive armor)	TOW-2B top attack missile	Line-of-Sight Antitank missile
Non-Line-of-Sight Antitank missile			Non-Line-of-Sight Antitank (combined arms)
Bradley main armament	25-mm M791 armor-piercing cartridge		
Tank main armament	120-mm M829 and M829A1 armor-piercing kinetic energy rounds	120-mm M829A2 kinetic energy round	Enhanced Kinetic Energy Weapon
	120-mm M830 high-explosive multipurpose antitank chemical energy round		Smart Target Activated Fire and Forget Round
	105-mm M456A2 high-explosive antitank round 105-mm M833 and M900A1 armor-piercing rounds		
Volcano mine system	BLU-91B Gator antitank mines		
Artillery			
Cannon	155-mm M483A1 and M864 (Baseburner) dual-purpose improved conventional munitions	155-mm Sense and Destroy Armor projectile with 5.8-inch diameter submunitions	
	155-mm M712 (Copperhead) projectile		
	155-mm M718 and M741 Remote Antiarmor Mines		
Multiple Launch Rocket System	Dual-Purpose Improved Conventional Munitions	Sense and Destroy Armor munition with 6.9-inch diameter submunitions	Low Cost Antiarmor submunition
Army Tactical Missile System	Antipersonnel/Antimateriel Munition		Brilliant Antiarmor Submunition (Tri-service Standoff Attack Missile)

(continued)

**Chapter 1
Introduction**

Weapon type	Currently fielded	Planned fielding	
		Prior to 1996	After 1996
Rotary wing aircraft			
Air-to-Ground Missile System	Hellfire missile	Hellfire II missile	Longbow (Hellfire Fire and Forget) missile
Volcano mine system	BLU-91B Gator antitank mines		
Fixed-wing aircraft			
	Maverick missile	Sensor Fuzed Weapon (Tactical Munitions Dispenser)	Sensor Fuzed Weapon (Joint Service Standoff Weapon)
	CBU-87 Combined Effects Munition		
	Rockeye bomb		
	BLU-91B Gator antitank mines	Wide area mines	
	30-mm GAU-8A cartridges		

Source: GAO analysis of DOD budget and OSD-provided documents.

In addition, the services have systems such as the advanced tank cannon, electric guns, and the very wide area mine in early technological development, which, assuming all the technological problems are solved, are potential future antiarmor weapon systems.

Revised Regulations for the Materiel Acquisition Process

In February 1991, OSD issued a revised series of acquisition regulations—the 5000 series—including DOD Directive 5000.1, Defense Acquisition; DOD Instruction 5000.2, Defense Acquisition Management Policies and Procedures; and DOD Manual 5000.2-M, Defense Acquisition Management Documentation and Reports. These revisions created a new single, standardized, DOD-wide system for acquisitions. Previously, each service had its own acquisition system, complete with separate regulations, policies, and procedures to determine and establish priorities for resource requirements. Each service prepared its unique requirements documents of varying scope and content. For major acquisitions—those programs requiring estimated research and development expenditures of \$300 million or procurement of \$1.8 billion in 1990 constant dollars—the service identified a mission need and OSD approved program initiation and funding. Under the new system, the services are limited to standardized requirements documents and, prior to seeking approval from OSD for program initiation, are required to study the alternatives to satisfy the mission need. Under the DOD 5000 regulations, OSD must approve major acquisitions before the programs are funded. Programs having acquisition

milestone reviews since August 1991 have been subjected to the new requirements.

The DOD acquisition regulations were revised in response to the 1989 defense management review and legislation² to (1) create a uniform system for defense acquisitions, (2) discipline and streamline the process, and (3) address such problems as the disconnection between acquisitions and the requirements and budgeting processes. The revised regulations established a standardized acquisition system with four program categories, based on cost, and decision authority at the lowest practical level.

The regulations require the Joint Requirements Oversight Council to review major acquisition programs to validate the need and program requirements. Non-major programs are reviewed at the service level. Acquisitions in the first two program categories—programs requiring more than \$540 million for procurement (in 1990 constant dollars)—consume roughly 85 percent of DOD's total acquisition budget. Smaller programs in the third and fourth categories represent more than 94 percent of acquisition programs.

The regulations established five review points for acquisitions, from early need determination through deployment. The regulations require a minimum set of standardized documents for all programs to identify needs, performance objectives, and operational requirements, based on analysis of threat, long-term affordability, and the cost and operational effectiveness of alternative capabilities. Depending on a program's risk and status, the regulations permit the services to limit the formality of program review and documentation. The services update their analyses, as necessary, at the various review milestones throughout the acquisition process.

Objectives, Scope, and Methodology

We reviewed the process by which DOD justifies the need for antiarmor systems acquisitions. Our objectives were to determine if DOD's acquisition process evaluates whether the services are acquiring only those weapon systems that (1) are needed to defeat the threat, (2) do not duplicate current capabilities, and (3) are affordable.

²Goldwater-Nichols Department of Defense Reorganization Act of 1986 (P.L. 99-433, Oct. 1, 1986, as amended).

We focused our review primarily on the Army's process for identifying and justifying antiarmor acquisitions because Army investment in antiarmor weapon systems has been the largest among the services. However, we also conducted a limited review of other services' processes to acquire weapon systems with an antiarmor capability.

On the basis of an examination of budget documents and service weapons system descriptive documents, we identified antiarmor capable weapon systems in the early stages of development, acquisition, or inventory. We selected 11 major acquisition programs that, at the time of our review, collectively represented the majority of antiarmor modernization efforts across the services and differing stages of development. Our selection included seven Army programs, three joint Army-Marine Corps programs, and one Air Force program. The programs are (1) the Armored Gun System (Army), (2) the Javelin antitank weapon (Army and Marine Corps), (3) the Sense and Destroy Armor munition (Army), (4) the Hellfire missile and its variants (Army and Marine Corps), (5) the Longbow Apache System (Army), (6) the Army Tactical Missile System (Army), (7) the Sensor Fuzed Weapon System (Air Force), (8) the tow missile and its variants (Army and Marine Corps), (9) the Block III tank (Army), (10) the Non-Line-of-Sight Antitank missile (Army), and (11) the Line-of-Sight Antitank missile (Army).

During our review, the Army moved the Block III tank, the Non-Line-of-Sight Antitank missile, and Line-of-Sight Antitank missile programs back to early technical development (called technology base).

We reviewed the DOD 5000 series regulations on defense acquisition; DOD and service regulations governing acquisitions (most of them were replaced by the revised DOD 5000 series); planning and budgeting regulations; policies, procedures, and the charter for the Joint Requirements Oversight Council; and recent defense intelligence and threat assessment documents. For each of the 11 antiarmor acquisition programs, we examined acquisition documents required by the DOD 5000 series regulations (where available), such as the mission needs statement, the operational requirements document, the cost and operational effectiveness analysis, and the system threat assessment report.

We discussed DOD's process to justify current acquisitions of antiarmor weapon systems with officials at the headquarters of the Departments of Defense, the Army, the Navy, and the Air Force, Washington, D.C.; the Marine Corps Combat Development Command, Quantico, Virginia; the

Army Combined Arms Command, Fort Leavenworth, Kansas; the Army Training and Doctrine Command, Fort Monroe, Virginia; the Defense Intelligence Agency, Washington, D.C.; the DOD Inspector General's Office, Arlington, Virginia; the Army Materiel Command, Alexandria, Virginia; the Army Audit Agency's Southeastern Region, Glen Burnie, Maryland; and the Army Intelligence Agency, Alexandria, Virginia.

We performed our work from April 1991 to October 1992 in accordance with generally accepted government auditing standards. We provided a draft of this report to DOD, but did not obtain fully coordinated comments from the Department. However, we discussed a draft of this report with officials from the Office of the Under Secretary of Defense for Acquisition; the Office of the Assistant Secretary of Defense for Program Analysis and Evaluation; the Office of the Joint Chiefs of Staff; the Office of the Assistant Secretary of the Army for Research, Development and Acquisition; the Army's Office of the Deputy Chief of Staff for Operations and Plans; the Air Force's Office of the Assistant Secretary; and the Marine Corps' Combat Development Command. They generally agreed with our findings and recommendations. We have incorporated their comments and suggestions in the report where appropriate.

Analyses Supporting Need Not Updated Since Threat Changed

During the Cold War, U.S. military planners designed an antiarmor force to protect against a Soviet-launched armored attack. Threat assessments described the former Warsaw Pact alliance as a numerically superior, increasingly capable, heavy mechanized force. For the last 40 years, the Army's response to this threat was to forward deploy heavy forces in Western Europe. Over the last few years, the collapse of the Soviet Union, the dissolution of the Warsaw Pact, and the continuing turmoil within the former Soviet Union have severely diminished this threat, while creating new ones. A number of major antiarmor weapons programs currently being acquired were originally justified on the old threat.

In response to the recent significant changes in threat, the Army and the Air Force jointly developed and proposed a new doctrine for ground forces. The Army is using this emerging doctrine to determine what changes it needs to make in its organization and equipment. It places a premium on deployability and long-range weapon systems. However, our review indicated most antiarmor weapons programs have not been justified using the emerging doctrine.

In general, the services conduct analyses of the changing threat and needs at acquisition milestones. For individual acquisition programs, they prepare a series of requirements documents outlined in the DOD 5000 series regulations. Outside of milestone reviews, DOD has made some changes to ongoing acquisitions during the annual budgeting process to respond to the changed threat. Although DOD conducts informal analyses and special studies, DOD's decisions were generally not supported by the analyses that are required for acquisition milestones.

Acquisitions Were Not Justified on the Current Threat

Since 1989, the Soviet threat has diminished. In January 1992, the Director of the Defense Intelligence Agency reported that the former Soviet Union's ability to directly threaten the United States and the North Atlantic Treaty Organization with large-scale military operations has greatly diminished. The Director concluded that the most serious threats to U.S. national security interests over the next 10 years fall into two broad categories: (1) the potential for regional conflicts worldwide and (2) the proliferation of weapon systems from the former Soviet Union and other countries.

Although the intelligence community and DOD generally agree that the threat has changed, there is no consensus on the extent to which the threat has changed or its effect on the need for antiarmor capability. OSD officials stated that Soviet equipment is still the threat used to justify new

acquisitions because the former Soviet states will continue to develop and sell armored weapons to Third World countries. Further, the Director of the Defense Intelligence Agency reported that (1) the former Soviet states had reduced defense spending and (2) Russia appeared to cut its defense budget proposal for the first quarter of 1992 by about 80 percent and might reduce research and development by as much as 30 percent in 1992.

The DOD 5000 series regulations require the services to assess the need and establish operational requirements for new acquisitions based on the threat. Our review of requirements documents supporting major antiarmor acquisitions ongoing at the time of our review disclosed that requirements were based on the need to defeat expected advances in Soviet armor. These programs were the (1) Javelin weapon; (2) Sense and Destroy Armor munition; (3) Army Tactical Missile System; (4) TOW missiles, including upgrades; (5) Hellfire missiles, including upgrades; (6) Line-of-Sight Antitank System; (7) Block III tank program; (8) Sensor Fuzed Weapon System; and (9) Longbow. In three cases, supporting documentation was prepared prior to the collapse of the Soviet Union. For two remaining programs we reviewed, the Non-Line-of-Sight Antitank system's supporting documentation identified the threat as Soviet and Third World weapons proliferation and the Armored Gun System's required operational capability statement did not discuss the threat. An October 1991 updated cost and operational effectiveness analysis for the Armored Gun System was based on regional threat scenarios.

The cost and operational effectiveness analysis is the major method the services are to use in evaluating the costs and benefits of alternative weapon systems to meet a warfighting need based on the threat. According to an official of OSD's Office of Program Analysis and Evaluation, the threat information contained in the cost and operational effectiveness analysis is the threat used in evaluating the weapon system. The analyses used models to evaluate alternative solutions based on simulated battles across a range of scenarios. The scenarios represented potential warfighting situations and included the capabilities of potential threat systems. Army Combined Arms Command officials said that Army analysts are in the process of updating the scenarios to reflect the changed threat; however, officials estimated that it would be mid-1994 before regional threat scenarios are developed. The Army has updated the threat assessment in the cost and operational effectiveness analysis document for one of the nine antiarmor programs for which analyses were prepared—the Armored Gun System.

Current Acquisitions Were Not Justified on the Emerging Doctrine

The AirLand Battle doctrine has driven the Army's warfighting concepts for the last decade, shaping the force structure needed on the battlefield. However, the Army is using a group of studies collectively titled "AirLand Battle Future" to determine what changes are needed in its doctrine, organization, and equipment. As a result of these studies, the Army and the Air Force jointly published on August 1, 1991, a pamphlet entitled AirLand Operations to disseminate emerging battlefield concepts. Both services approved the AirLand Operations concept. According to an official of the Army's Combined Arms Command, full acceptance and implementation of the emerging doctrine could take 3 to 5 years. The Army is drafting a manual to implement the emerging doctrine. A fundamental principle of this doctrine is force projection to contingencies worldwide; however, the doctrine will continue to emphasize the requirements of forward-deployed forces.

According to an OSD official, the original AirLand Battle doctrine addressed the broad spectrum of battle scenarios. The doctrine focused on deterring Soviet aggression in Europe and contributing to regional stability through forward deployments. The Army designed antiarmor weapon systems for a U.S.-Soviet conflict in Central Europe involving close combat of high-density ground maneuver forces.

The emerging AirLand Operations doctrine results, in part, from significant technological advances, coupled with projected fiscal constraints. Technological advances make it possible to field surveillance systems that allow the Army to know the location of large enemy forces. According to the emerging doctrine, increases in lethality, range, and accuracy of modern weapon systems will enable the Army to engage large enemy forces using longer range weapons. However, the enemy may be able to do the same, requiring U.S. forces to disperse to survive. The need to disperse forces will result in a future battlefield with frequent large gaps between forces. The Army calls this a "nonlinear battlefield."

The emerging AirLand Operations doctrine places a premium on antiarmor weapon systems that are more mobile, more deployable, and longer range than those required by the AirLand Battle doctrine. The emerging doctrine emphasizes the projection of combat power from the continental United States, using a smaller force, instead of large forward deployments. Army forces are to be prepared to deploy to troubled locations on short notice. Intelligence-gathering and target acquisition systems are expected to provide the opportunity to achieve greater accuracy and lethal fire from

long ranges. Weapon systems are to be agile—to evade enemy counter fire and to move and generate combat firepower quickly.

Our review of operational requirements documents and cost and operational effectiveness analyses supporting selected major antiarmor acquisitions disclosed that all were originally justified based on the current AirLand Battle doctrine—except the Armored Gun System.¹ For the remaining antiarmor programs, the services have not reassessed the need for continued acquisition based on an updated operational requirements document or cost and operational effectiveness analysis. In addition, according to officials of the Army's Combined Arms Command, cost and operational effectiveness analyses were not fully capable of modeling all emerging doctrinal needs. For example, a weapon system that is deployable is an important feature of the emerging doctrine; however, the analysis models used started with the weapon systems positioned for battle, excluding systems deployment.

Decisions Are Not Supported by Analyses

The collapse of the Soviet Union, dissolution of the Warsaw Pact threat, and an emerging AirLand Operations doctrine could affect the kinds of weapon systems needed to defeat the current and future threat. The military services are beginning to consider changing needs to assess individual weapon systems programs at acquisition milestones. In addition, in response to the dramatic changes in threat and the decreasing defense budget, the services have made changes to acquisition programs as part of their annual budgeting process. However, according to OSD officials, these decisions generally have not been based on analyses as are required at major milestones.

As required by the DOD 5000 series regulations, the services conduct extensive in-depth analyses of the need for continued acquisition of weapon systems when programs are scheduled to transition to the next phase in the acquisition process. However, according to an OSD Program Analysis and Evaluation official, due, in part, to cost considerations and time constraints, the services usually do not update their analyses between program milestones. Completing each phase of acquisition, such as engineering and manufacturing development, can take years. In addition, the DOD 5000 regulations do not require the services to conduct analyses to reassess the continued need for new weapon systems after the program

¹The analysis for the Armored Gun System, prepared in October 1991, was based on the emerging AirLand Operations doctrine.

enters production. According to an OSD official, the services update portions of cost and operational effectiveness analyses.

In response to changing needs, the services have reduced procurement quantities, restructured and extended schedules, and discontinued acquisition programs during the annual budgeting process. For example, the Army moved the Line-of-Sight Antitank system back to early technical development. According to OSD and Army officials, this demonstrates that the Army considers the current threat and emerging doctrine to assess the need for new acquisitions. However, decisions made during the budgeting process—such as the decision to discontinue the Armored Systems Modernization program—were not based on analyses as are required at acquisition program milestones. We could not verify the extent to which threat and emerging doctrine were considered in DOD's decision-making process because officials did not provide supporting documentation.

In January 1992, in response to threat changes and the need to maintain a technological advantage in future conflicts, the then Secretary of Defense announced a new approach to materiel acquisition that was to devote more time toward developing and evaluating new technologies before approving weapons production. The approach emphasizes verifying the need for a new weapon system prior to production and upgrading existing systems using proven technologies. However, the new approach does not require the services to evaluate the need for acquisitions already in production.

Conclusions and Recommendation

The changed threat environment could affect current and future warfighting needs. A new emerging doctrine emphasizes the importance of weapon systems' deployability, mobility, and long-range fire capability. However, many of the Army's current antiarmor acquisitions were justified on threat projections that predated those changes and the emerging doctrine. DOD does not usually conduct analyses of the need for new weapon systems except when programs transition to the next phase of acquisition. DOD officials stated that they consider the changed threat as part of the annual budgeting process, but decisions at that point have not been based on analyses as are required at acquisition program milestones. Without analyses of ongoing acquisition programs against current threat and emerging doctrinal needs, DOD and the services do not have reasonable assurances that antiarmor capable weapon systems in acquisition reflect current and projected future warfighting needs.

Chapter 2
Analyses Supporting Need Not Updated
Since Threat Changed

We recommend that the Secretary of Defense assess the continued need for the antiarmor acquisitions currently planned in light of the significant changes in threat.

Assessments Supporting Antiarmor Acquisitions Often Limited in Scope

In light of current and expected future reductions in the defense budget, the Secretary of Defense has emphasized the increasing need for the services to avoid funding new weapon systems with unnecessarily redundant capabilities. In addition, officials of the OSD Office of Program Analysis and Evaluation have stressed the need for the services to conduct more broad-based analyses of alternatives. They proposed that the services assess trade-offs between alternatives in differing mission areas, such as the capability of artillery versus tanks or the Army versus the Air Force, to satisfy a warfighting need.

Our review of Army and Air Force analyses to support ongoing acquisitions disclosed that many of the analyses did not assess alternative weapon systems in related mission areas. Therefore, the process does not ensure that new acquisitions do not unnecessarily duplicate existing capabilities. To establish the continued need for antiarmor alternative weapon systems, the Office of Program Analysis and Evaluation is planning a 2-year study of the antiarmor mission, yet it is currently not funded.

Analyses Do Not Assess a Full Range of Alternatives

To justify the need for a new acquisition, DOD regulations require the services to identify and document alternative capabilities in a mission needs statement and evaluate those capabilities in an operational requirements document. In addition, the services are required to prepare a cost and operational effectiveness analysis to assess the trade-offs and costs of possible alternative weapon systems. The operational requirements document and the cost and operational effectiveness analysis are to be updated over the course of the acquisition.

As the acquisition proceeds, the purpose of analyses changes from justifying the need for new weapon systems to establishing their operational parameters. The updates generally narrow the range of alternative systems assessed. Analyses prepared during a system's later stages of development contain fewer alternatives because the scope of alternatives has already been narrowed.

Our review of the most current cost and operational effectiveness analyses for six Army antiarmor acquisition programs disclosed that the analyses did not include assessments of a range of alternatives to satisfy the mission need. In general, the analyses did not include capabilities in related missions and other services. Although DOD approved these six programs for continued acquisition, DOD subsequently terminated one and

returned two to the technology base for further development. As discussed below, except for the Armored Gun System analysis, all analyses were prepared prior to the implementation of the revised DOD 5000 regulations.

- The analysis for the TOW missile's Sight Improvement Program, dated January 1991, compared the program to only one other missile sight program. Although approved, DOD subsequently terminated the program in fiscal year 1992.
- The analysis for the Kinetic Energy Missile used with the Line-of-Sight Antitank system, prepared for a 1990 acquisition milestone, compared the missile to another missile system and to the Kinetic Energy Missile on another platform. Although approved, DOD subsequently returned the program to the technology base in fiscal year 1992.
- The analysis for the Block III tank, prepared for a 1990 acquisition milestone, compared the tank to two other tank systems. Although approved, DOD subsequently returned the program to the technology base in fiscal year 1992.
- The analysis for the Longbow missile system, dated April 1990, compared the missile system to two other missile systems.
- The analysis for the Javelin weapon, prepared for a 1989 acquisition milestone, compared three possible Javelin technologies to one fielded antitank system.
- The analysis for the Armored Gun System, prepared for a 1991 acquisition milestone, compared two versions of the system and three alternatives. One of the alternatives was a Marine Corps system. However, all systems were from the same mission area.

According to DOD officials, cost and operational effectiveness analyses do not include all alternative weapon systems the services considered. They said the services consider and reject alternative systems before preparing the analyses. However, the rationale for rejecting such alternatives is not documented. As such, the analyses do not provide an assessment of a range of alternative capabilities and, thus, lack the assurances that the planned acquisitions do not unnecessarily duplicate existing capabilities. Although we requested, Army officials did not provide documentation that they had assessed the need for these acquisitions against alternatives across DOD.

DOD regulations require the services to identify alternative weapon systems in a mission needs statement and evaluate them in an operational requirements document. However, our review of mission needs and the operational requirements documents the Army used to support major

antiarmor acquisitions, ongoing at the time of our review, disclosed that, with one exception,¹ acquisition programs were not justified based on an assessment of the alternative capabilities of current and planned weapon systems. For four acquisition programs—the Army Tactical Missile System, the Longbow system, the TOW missile, and the Hellfire missile—the documentation did not include any assessment of alternative capabilities. Documentation justified the acquisition of four other new weapon systems—the Javelin, the Line-of-Sight Antitank system, the Armored Gun System, and the Block III tank—based on the need to replace a fielded system, without an assessment of alternative capabilities.

Our review disclosed that when the services did assess alternatives they tended to limit their analyses of alternative capabilities to their own weapon systems—while recognizing that similar capabilities were available beyond service lines. For example, the Air Force's operational requirements document for the Sensor Fuzed Weapon stated that the Army's Sense and Destroy Armor munition had similar capabilities. However, both the operational requirements document and the cost and operational effectiveness analysis for the Sensor Fuzed Weapon limited the comparison of alternative capabilities to four air-launched weapon systems, all of which were weapons used by the Air Force. These documents did not include an assessment of the similar capabilities of the Army's Sense and Destroy Armor munition nor did they document the reasons why this alternative weapon was not assessed. Both acquisitions are cluster-type weapon systems consisting of a munitions dispenser containing submunitions. The Sensor Fuzed Weapon and Sense and Destroy Armor munition are similar in design and capability, but have differing range capabilities. In both systems, the dispenser releases the submunitions over a target area, submunition sensors scan the target area, and if the sensor detects a target, the submunition fires a penetrator into the target. Both are ongoing acquisition programs.

We concluded in an August 1991 report² that the Air Force's cost and operational effectiveness analysis for the Sensor Fuzed Weapon system was incomplete because it did not compare the system to a range of weapons that could be used to interdict enemy forces, such as Air Force mines and Army surface-to-surface and air-to-surface missiles. According to an Air Force official, the Air Force generally limits its assessment of

¹The mission needs statement for the Non-Line-of-Sight Antitank missile program identified the capabilities of existing artillery munitions, the Multiple Launch Rocket System, Wide Area Mine munitions, Mortars, Army Attack helicopters, and fixed-wing close air support.

²Munitions Procurement: Resolve Questions Before Proceeding With Sensor Fuzed Weapon Production (GAO/NSIAD-91-235, Aug. 16, 1991).

alternatives to Air Force systems. Likewise, the mission need statement for the Army's Sense and Destroy Armor munition only identified other Army systems and capabilities and did not identify the capabilities of other services. The Sense and Destroy Armor munition's operational requirements document did not examine any alternatives.

To establish the continued need for antiarmor alternative weapon systems, the Office of Program Analysis and Evaluation is planning a 2-year study of the antiarmor mission. Current plans are to examine the effectiveness of selected mixes of weapon systems and munitions against projected armor threats and to develop recommendations on the disposition of antiarmor programs currently under consideration by DOD. The review is expected to identify trade-offs among alternative sets of antiarmor programs from each of the services by comparing force effectiveness, cost, and affordability. However, the study is currently not funded and does not have a start date.

Oversight Council Responsible for Minimizing Redundancy

To initiate a major acquisition program, the DOD 5000 series regulations require the Joint Requirements Oversight Council to ensure that the services first assess a range of alternative weapon systems across DOD to meet a warfighting need. The purpose is to minimize parallel and unnecessarily redundant development efforts.

To validate the need for a new weapon system, the system proponent is to brief the five-member Council on the warfighting need. When reviewing a system, the Council relies upon analyses provided by system proponents. Its procedures call for the service to compare the proposed acquisition with existing concepts, systems, or programs with similar capabilities. The system proponent selects the systems for comparison and, when there are redundant capabilities, explains why the new system is needed.

As of March 1992, the Council had reviewed five antiarmor programs—the Army Tactical Missile, the Armored Systems Modernization, the Longbow with the Apache helicopter, the Sensor Fuzed Weapon, and the Javelin. (The Council reviewed the Javelin program twice.) Documentation for the first Javelin briefing, as well as documentation for the Army Tactical Missile System and the Armored Systems Modernization program, did not include a comparison of the proposed acquisition to alternative weapon systems. A fourth briefing document, for the Longbow Apache program, included only a comparison of the Longbow Apache missile to other Apache configurations. These reviews were conducted during 1990 and early 1991. In March 1991, the Council issued a briefing guide to the

services requiring that the services include a chart comparing available capabilities to operational needs. The two remaining briefing documents included comparison charts, but the scope of alternatives assessed was incomplete. The documentation for the second Javelin briefing compared the Javelin to two weapon systems, an Army system and a foreign-built system, both with the same mission. The Sensor Fuzed Weapon documentation compared the program to five systems, all of which were used by the Air Force.

In July 1992, the Joint Requirements Oversight Council issued a revised briefing guide calling for an expanded assessment of alternative capabilities. For the first acquisition milestone, the guide calls for the services to assess alternative systems with similar characteristics from across service lines. At subsequent milestones, the services are asked to compare, at a minimum, those systems compared in the cost and operational effectiveness analysis. Service representatives are to be prepared to defend before the Council the alternatives selected. The revised guide, however, does not specifically call for the services to compare capabilities with other related missions.

In September 1992, the Joint Requirements Oversight Council issued a policy memorandum assigning the services the responsibility for eliminating duplication of capabilities through effective cooperation and coordination with other services and DOD agencies. The policy requires the services to coordinate mission needs with affected services and agencies. The policy statement, however, does not establish criteria on which the services are to evaluate the documents.

Conclusions and Recommendation

The DOD 5000 acquisition regulations require the services to assess the need for a new acquisition against alternatives in other services. The services, however, have not fully implemented the new regulations. In general, cost and operational effectiveness analyses prepared by the Army and the Air Force did not assess other services' systems with antiarmor capabilities. Operational requirement documents either did not assess alternative weapon systems or conducted a limited assessment. OSD is planning a 2-year study of the antiarmor mission that is expected to include an examination of the continued need for antiarmor alternatives to recognize the changed threat environment. However, the study is currently not funded.

The Joint Requirements Oversight Council has the responsibility for ensuring that in justifying the acquisition of a new weapon system, the services assess a complete range of alternative systems. The briefings presented to the Council either contained no evidence of such an assessment or evidence of only limited assessments. The Council recently issued guidance to the services calling for a broad assessment of alternative capabilities and has issued policy guidance for them to coordinate needs documentation and limit capability redundancies.

We recommend that the Secretary of Defense ensure that the services are not acquiring antiarmor systems that unnecessarily duplicate existing capabilities because they did not adequately consider alternatives in other services.

DOD's Process Does Not Ensure the Long-Term Affordability of Antiarmor Acquisitions

In light of expected reductions in future defense budgets, it is increasingly important that the services consider the long-term affordability of their antiarmor acquisitions. The DOD 5000 regulations require the services to assess the affordability of major acquisition programs to the end of procurement. However, according to an OSD official, the services have prepared few assessments of the long-term affordability of their antiarmor acquisition programs. Moreover, OSD has not issued guidance on how to assess the long-term affordability of programs. In the interim, OSD requires that a program's affordability be assessed, but not to the extent required by the DOD 5000 regulations. As such, DOD has less assurance that antiarmor weapon systems currently in development will be affordable when the programs reach production.

DOD Has Prepared Few Assessments of the Long-Term Affordability of Acquisitions

The regulations require that beginning in August 1991, the services must prepare affordability assessments for new acquisitions prior to program initiation and at subsequent acquisition milestones. The goal of this regulation is to promote program stability and ensure that programs are affordable through an early and thorough assessment of funding needs and constraints. The services are required to assess the near-term affordability of weapon systems in DOD's approved Future Years Defense Program, which identifies and allocates total resources to the various defense missions over a 6-year period. In addition, the regulations require the services to compare resource needs with affordability constraints for the life of the program. OSD drafted guidance on how to prepare the required affordability assessments, but it has not finalized the guidance.

An official from the Office of the Under Secretary of Defense for Acquisition said that the services have not prepared affordability assessments that would satisfy current regulations. He also said that the services may not have the analytical resources to assess an acquisition's affordability. OSD is working with the services to prepare the assessments. As of March 1992, DOD had completed affordability assessments for 2 of the 11 acquisition programs we reviewed. The first assessment, of the Army's Armored Systems Modernization Program, was completed before the revised DOD 5000 series regulations were issued. The second, of the Air Force's Sensor Fuzed Weapon System, was dated March 1992. This assessment used Air Force cost estimates to compare (1) the estimated program costs to resources programmed in the 6-year Future Years Defense Program and (2) the total estimated costs of missile development efforts to the estimated budget for the 6-year period beyond the Future Years Defense Program. The OSD Cost Analysis Improvement Group

reviewed the Air Force's program cost estimates and determined that they were too optimistic. However, the Deputy Assistant Secretary for OSD Program Analysis and Evaluation and the Deputy Director for Acquisition Policy and Program Integration in the Office of the Under Secretary of Defense for Acquisition concluded that the system was affordable—assuming stable outyear funding.

In the absence of procedures for preparing affordability assessments, the Deputy Secretary of Defense and the Under Secretary of Defense for Acquisition require the services to demonstrate affordability for each weapon system subject to a defense review. Within the 6-year Future Years Defense Program, the services must identify acquisition funds available or indicate reductions in other programs to provide funds. If funding is not expected to be available, the services may consider possible trade-offs to change or replace the program. However, the new policy requirement does not fully implement the DOD 5000 series regulations that require the services to identify funding needs and availability through procurement of the program.

In September 1992 we reported¹ that OSD had increased its efforts to require that the services address potential funding shortfalls during the budget process; however, the budget reviews may not occur until months after a program has been approved for continued acquisition. In addition, budget documentation did not always link funding for the identified shortfall to reductions in specific programs.

Conclusions and Recommendation

The DOD 5000 series regulations require the services to prepare affordability assessments of acquisition programs in the Future Years Defense Program and through the end of procurement. However, according to an OSD official, DOD has prepared few assessments of the long-term affordability of antiarmor acquisition programs. OSD drafted implementing guidance to prepare affordability assessments and has issued interim guidance requiring the services to demonstrate a program's affordability within the Future Years Defense Program and the following 6-year period. However, OSD does not require the services to demonstrate the affordability of a program through procurement. As such, DOD does not have adequate assurances that antiarmor programs currently in development will be affordable through the end of procurement.

¹Weapons Acquisition: Implementation of the 1991 DOD Full Funding Policy (GAO/NSIAD-92-238, Sept. 24, 1992).

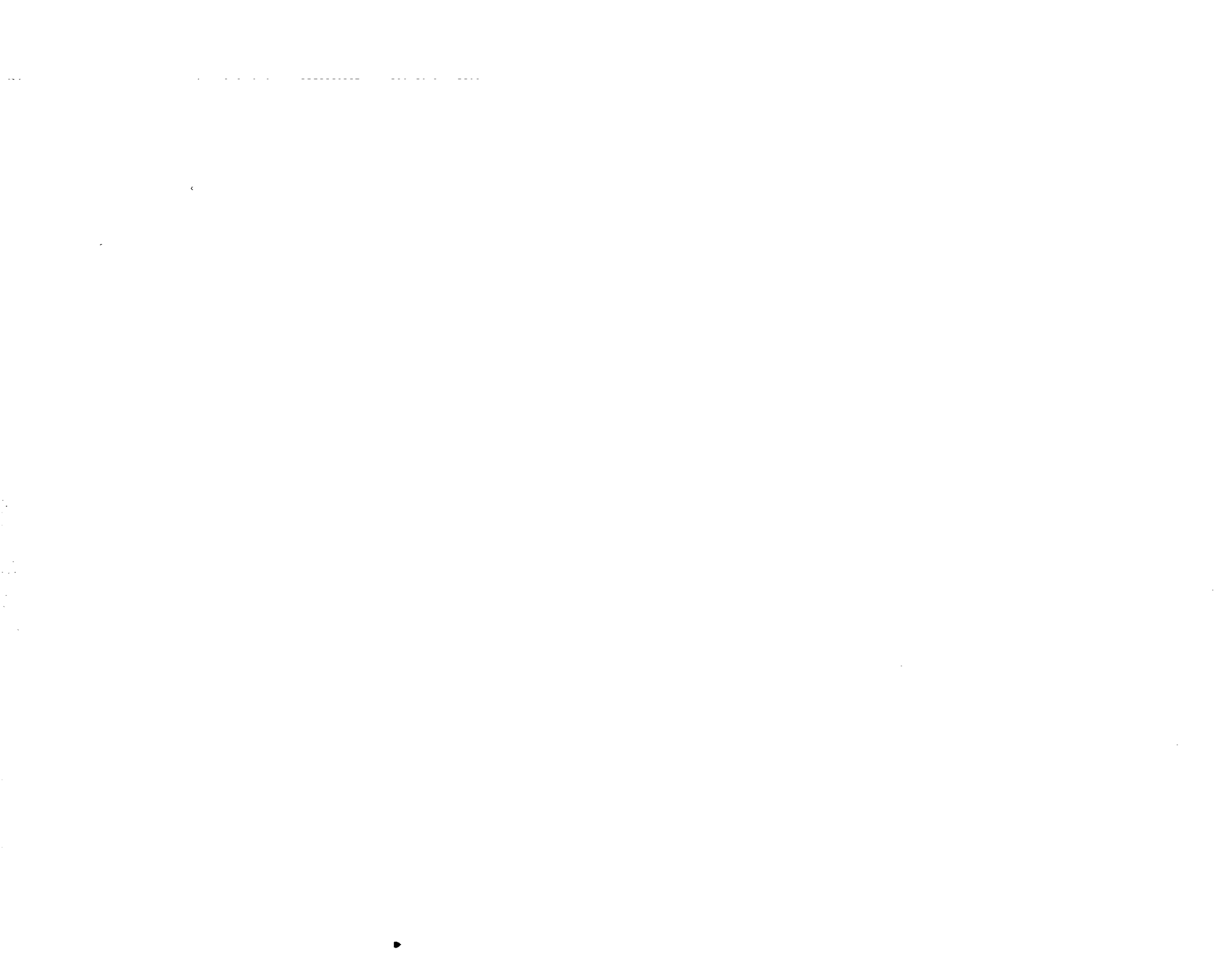
Chapter 4
DOD's Process Does Not Ensure the
Long-Term Affordability of Antiarmor
Acquisitions

We recommend that the Secretary of Defense require that the services comply with the regulations to conduct assessments of the long-term affordability of antiarmor acquisitions as required by the DOD 5000 regulations.

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