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Report to Congressional Requesters

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WEAPONS ACQUISITIONS

Guided Weapon Plans Need to Be Reassessed

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International Affairs Division

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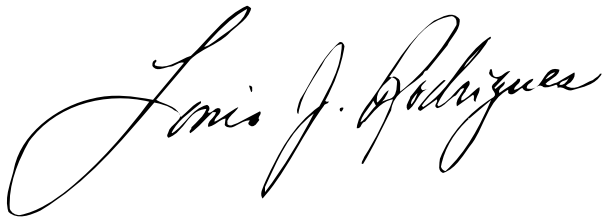
The Honorable C.W. Bill Young
Chairman, Subcommittee on National Security
Committee on Appropriations
House of Representatives

The Honorable Curt Weldon
Chairman, Subcommittee on Military
Research and Development
Committee on National Security
House of Representatives

As you requested, this report addresses the affordability and cost-effectiveness of guided weapons currently in development and production. We have concluded that the acquisition plans for guided weapons are based on optimistic funding projections, guided weapon requirements appear to be inflated, there is a proliferation of guided weapon capabilities and acquisition programs, and oversight of guided weapon requirements and acquisition programs needs improvement. The report makes a number of recommendations to the Secretary of Defense, including one to reevaluate the planned deep attack weapon acquisition programs in light of existing capabilities and the current budgetary and security environment.

We are sending copies of this report to the other defense committees and subcommittees; the Secretaries of Defense, the Army, the Air Force, and the Navy; the Commandant of the Marine Corps; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request.

Please call me at (202) 512-4841 if you or your staff have any questions concerning this report. Major contributors to this report are listed in appendix II.



Louis J. Rodrigues
Director, Defense Acquisitions Issues

Executive Summary

Purpose

Over the next 10 years—from fiscal year 1998 to 2007—the Department of Defense (DOD) plans to invest about $16.6 billion (then-year dollars) to procure guided weapons that can be used for deep attack missions.[1] Concerned about the affordability and cost-effectiveness of guided weapons currently under development and in production, the Chairmen of the National Security Subcommittee, House Committee on Appropriations, and of the Subcommittee on Military Research and Development, House Committee on National Security, requested that GAO examine major guided weapon programs. Specifically, the Chairmen requested that GAO determine whether (1) the services' plans for developing and/or procuring guided weapons can be carried out as proposed within relatively fixed defense budgets, (2) the number of guided weapons the services plan to buy is consistent with projected threats and modernization needs, (3) the current and planned guided weapon programs duplicate or overlap each other, and (4) DOD is providing effective oversight in the development and procurement of deep attack weapons.

Background

Guided weapons can be delivered more accurately to a target than unguided weapons because they have the capability for in-flight guidance correction. The choice of a specific guided weapon depends on the type of target, the target's distance from the launching platform, and the target's location.

Following the Persian Gulf War, DOD identified a number of improvements to its weapons that could increase the effectiveness of U.S. forces. These improvements were needed to ensure target destruction and yet minimize the number of missions and weapons used, unwanted collateral damage, and exposure of friendly aircraft to enemy defenses. Thus, in the 1990s, the services initiated several programs to upgrade existing weapons and produce new guided weapons. The acquisition programs now underway are expected to cost about $16.6 billion (then-year dollars) from fiscal year 1998 to 2007. These programs would almost double the existing inventory of guided weapons through the acquisition of 158,800 new guided weapons. For about 127,000 of the new guided weapons to be acquired, a guidance kit will be added to an existing unguided weapon.

In 1997, DOD released the results of a congressionally directed study on the size and mix of its deep attack weapons and subsequently issued its

[1]Deep attack missions are operations carried out beyond the areas where friendly ground forces operate.

Quadrennial Defense Review, which based its recommendations on the study's results.

Results in Brief

DOD's planned increase in procurement spending for guided weapons is based on overly optimistic funding projections. To acquire all the guided weapons now planned over the next 10 years, DOD plans to spend more than twice as much as it has on average between fiscal year 1993 and 1997. Without an increase in overall defense spending, increased resources may not be available as expected.[2] In addition, for the past several years DOD has been unable to increase its procurement budgets as planned, and other programs, such as tactical aircraft, could more than absorb any available increases.[3] Further, with rapid advances in weapons technology, more capable weapons are expected to be available in the coming years and will probably compete for the same resources. In the past, such resource conflicts were resolved by stretching out planned production, thus increasing unit costs and delaying deliveries.

While DOD has enough deep attack weapons (guided and unguided) in its inventory today to meet current national objectives, the services plan to add 158,800 additional guided weapons to the current inventory. Each of the new weapons has been justified by the services on a case-by-case basis and is projected to provide significant advantages in accuracy, lethality, delivery vehicle safety, and/or control of unintended damage. However, it is difficult to understand DOD's rationale for doubling its inventory of guided weapons in today's budgetary and security environment. Further, in calculating the number of weapons needed, the services use assumptions that overstate the potential threat and target base. As a result, the quantity requirements for guided weapons appear to be inflated, particularly in today's budgetary and security environment.

Most of the weapon types being developed or improved are unique to each service. Further, when reviewing the services' currently planned programs in the aggregate, GAO found (1) widespread overlap and duplication of guided weapon types and capabilities, (2) questionable quantities being procured for each target class, and (3) a preference for longer standoff[4] and more accurate weapons when other options may be as effective and

[2]Future Years Defense Program: DOD's 1998 Plan Has Substantial Risks in Execution (GAO/NSIAD-98-26, Oct. 23, 1997).

[3]Aircraft Acquisition: Affordability of DOD's Investment Strategy (GAO/NSIAD-97-88, Sept. 8, 1997).

[4]Standoff range is the distance between the weapon launcher and the target.

less costly. In contrast, DOD's Deep Attack Weapons Mix Study and Quadrennial Defense Review suggested only minor changes in guided weapon programs and did not address possible instances of duplication and overlap. GAO believes that DOD does not yet have a sound basis to ensure that it has the proper and cost-effective mix of deep attack weapon programs. While the Deep Attack Study was certainly a step in the right direction, independent reviewers of the study both within and outside the services have criticized its methodology and cite its reliance on computer models that have significant shortcomings.

DOD's oversight of the services' guided weapons programs has not prevented, among other things, inflated requirements or program overlap and duplication. Lacking an analysis of overall deep attack capabilities, including the incremental contribution of each new weapon, acquisition programs have proliferated and quantities have been overstated. The central oversight bodies and mechanisms already in place do not address requirements and capabilities on an aggregate basis and have had a very limited effect on guided weapon programs. No office is responsible for reviewing the services' aggregate needs and capabilities of guided weapons programs. The Office of the Secretary of Defense and the Joint Chiefs of Staff currently examine programs on a case-by-case basis but mostly defer to the services' requirements processes. Therefore, each of the services has justified unique weapons with relatively low production rates, thus increasing acquisition and logistics costs and inhibiting interoperability. Some DOD officials believe improved oversight is needed, and a proposal is under consideration to expand the purview of the Joint Tactical Air-to-Air Missile Office to include the coordination of air-to-ground weapon requirements and programs. Expanding the Air-to-Air Office's purview should, in GAO's view, provide some assurance that decisions in the deep attack area have been assessed from the perspective of the services' combined requirements, capabilities, and acquisition plans.

Principal Findings

Acquisition Plans for Guided Weapons Based on Optimistic Funding Projections

According to the fiscal year 1999 Future Years Defense Program and longer term program plans, planned annual expenditures for guided weapon procurement are slated to increase from about $775 million in fiscal year 1998 to more than $2 billion in fiscal year 2003. From fiscal

year 1998 to 2007, planned annual expenditures for guided weapon procurement will average about $1.7 billion. Such expenditures would be more than twice the average annual expenditures for such weapons over the past 5 fiscal years. GAO believes these cost projections are conservative because historically, acquisition programs have typically experienced cost growth of 20 percent or more.[5] At the same time, other proposed major guided weapon procurement programs, if approved, could compete for the same resources.

This increase in guided weapon procurement funding is planned as other major procurement programs are also forecasting major increases. However, the overall defense budget is expected to remain relatively constant in real dollars, and DOD's infrastructure reductions have not yet generated the savings expected to fund the increased weapons procurement. GAO believes there will be a major imbalance between the funds needed and the funds likely to be available for DOD's planned procurement programs, including the guided weapon programs. In the past, funding shortfalls have been dealt with by reducing annual procurement quantities and stretching out programs. However, this has significantly increased the unit cost of weapons and delayed deliveries. Of particular concern is DOD's possible inability to start procurement of weapons with potentially revolutionary capabilities because of excessive commitments to older weapon programs.

DOD Guided Weapon Requirements Appear Inflated

While DOD has enough deep attack weapons in its inventory today to meet current national objectives, the services plan to add 158,800 guided weapons to the inventory. Each program has been justified by the services on a case-by-case basis, but in the aggregate, DOD has not demonstrated the overall cost-effectiveness of almost doubling the total quantities of guided weapons. In today's budgetary and security environment, it is difficult to understand the rationale for DOD's guided weapon plans.

In a 1997 report, GAO discussed the use and effectiveness of guided and unguided weapons and other aspects of the air campaign during the Persian Gulf War.[6] Neither guided nor unguided weapons were as effective as expected because, among other things (1) higher altitude deliveries were used, (2) aircraft sensors had inherent limitations in identifying and acquiring targets, (3) DOD failed to gather intelligence information on some

[5]The services are attempting to manage cost growth through initiatives such as "cost as an independent variable." We have not evaluated the effectiveness of these initiatives.

[6]Operation Desert Storm: Evaluation of the Air Campaign (GAO/NSIAD-97-134, June 12, 1997).

critical targets, and (4) DOD was unable to collect and disseminate timely battle damage assessments. Since the War, DOD has undertaken initiatives to address many of these problems, including the development of specific design features of new guided weapons. However, the effectiveness of these initiatives has not yet been fully demonstrated. Nevertheless, DOD projects that its new guided weapons will significantly improve its warfighting capability.

Further, the assumptions used by the services to estimate individual weapon requirements, overstate the potential threat and target base, favor long range and accurate guided weapons, and require large quantities of reserve weapons. As a result, the quantity requirements for guided weapons appear to be inflated, particularly in today's budgetary and security environment.

Proliferation of Guided Weapon Capabilities and Acquisition Programs

The services have substantial quantities of many different guided weapons to attack most, if not all, targets. Taken individually, the services' acquisition plans for guided weapons can be justified and are expected to add significant capabilities. However, acquisition plans for most of these weapon types are largely service-unique and the services have missed several opportunities to consolidate the development and procurement of deep attack capabilities and create more efficient acquisition programs. For example, the Air Force and the Navy are developing the Joint Air-to-Surface Standoff Missile, while the Navy is developing the Standoff Land Attack Missile—Expanded Response, even though either missile could be used by both services.

When reviewing the services' planned programs in the aggregate, GAO found (1) widespread overlap and duplication of guided weapon types and capabilities, (2) questionable quantities being procured for each target class, and (3) a preference for longer standoff and more accurate weapons rather than for other options that may be as effective and less costly. For example, the services plan to acquire four new types of standoff guided weapons—at a cost of about $7.2 billion for over 12,000 weapons—to attack fixed hard and soft targets. Each of these weapons has similar capabilities, and a variety of weapons are already available to attack these types of targets.

DOD's 1997 Deep Attack Weapons Mix Study stopped short of recognizing cases of overlap or duplication and did not recommend curtailing or canceling any guided weapons programs. DOD's Quadrennial Defense

Review, which based its recommendations on the study's results, determined that the current deep attack weapon acquisition plans could continue with only minor adjustments. However, the Air Force, the Navy, and two DOD-sponsored independent reviews all conclude that the computer models used in the weapons mix study featured outdated assumptions from the Cold War and did not accurately represent modern warfare. In GAO's view, while the study was certainly a step in the right direction, DOD still does not have a sound basis to ensure that it has the proper and cost-effective mix of deep attack weapon programs. While modeling has a role, the ultimate decisions on the best mix will require sound military and business judgment. Officials from the Joint Chiefs of Staff said that they plan to reassess deep attack weapons mix and affordability issues in 1998.

Oversight of Guided Weapon Requirements and Acquisition Programs Needs Improvement

DOD is not providing effective management oversight and coordination of its deep attack capabilities and programs to contain development costs, control logistics impacts, maximize warfighting flexibility, and avoid production stretch-outs. Instead, the task of developing and procuring weapons rests with the services. DOD's oversight has not prevented duplication of development, service-unique programs, and production schedule stretch-outs.

DOD has no central oversight body or mechanism to examine guided weapon programs in the aggregate and to assess how many weapons are needed to meet national objectives or how many weapons DOD can afford. The central oversight bodies and mechanisms already in place do not address requirements and capabilities on an aggregate basis and have had very limited effect on guided weapon programs. Some DOD officials believe improved oversight is needed, and a proposal is under consideration to expand the purview of the Joint Tactical Air-to-Air Missile Office to include the coordination of air-to-ground weapon requirements and programs. The Air-to-Air Office has shown that the services can effectively coordinate requirements and establish joint programs for the acquisition of similar weapons. Expanding its purview to include guided weapons should, in GAO's view, provide some assurance that decisions in the deep attack area have been assessed from the perspective of the services' combined requirements, capabilities, and acquisition plans.

Recommendations

GAO recommends that the Secretary of Defense, in conjunction with the Chairman of the Joint Chiefs of Staff and the Secretaries of the Army, the Navy, and the Air Force,

- establish an aggregate requirement for deep attack capabilities;
- reevaluate the assumptions used in their guided weapon requirements determination processes to reflect better and more cost-effectively the new international situation, realistic target sets, enhanced weapon effectiveness, proper weapon selection, and the use of advanced tactics; and
- reevaluate the planned deep attack weapon acquisition programs in light of existing capabilities and the current budgetary and security environment to determine whether the procurement of all planned guided weapon types and quantities (1) is necessary and cost-effective in the aggregate and (2) can clearly be carried out as proposed within realistic, long-term projections of procurement funding.

Further, as GAO recommended in 1996 in its combat air power reports, the Secretary of Defense, along with the Chairman of the Joint Chiefs of Staff, should develop an assessment process that yields more comprehensive information on procurement requirements and aggregate capabilities in key mission areas such as deep attack. GAO has pointed out that this can be done by broadening the current joint warfare capabilities assessment process or by developing an alternative mechanism. One such alternative would be the establishment of a DOD-wide coordinating office, modeled after the Joint Tactical Air-to-Air Missile Office, to consider the services' combined requirements, capabilities, and acquisition plans for guided weapons.

Agency Comments

In written comments on a draft of this report, DOD partially concurred with GAO's recommendations, stating that the Joint Staff will conduct a follow-up to the Deep Attack Weapons Mix Study and that a coordinating office will be established to assess joint weapon requirements. DOD stated that the report does not recognize its significant efforts to improve its requirements, acquisition, and oversight processes.

The follow-on study to the Deep Attack Weapons Mix Study that DOD is conducting would be useful and GAO urges DOD to conclude the study with decisions on which programs to cut back and which to end, in order to ensure that its programs are fully executable within expected budgets. Also, as a partial solution to the need for more comprehensive

assessments, DOD's agreement to establish a body to review and deconflict joint air-to-surface requirements should be helpful. Also important is the agreement of DOD that a body such as this might better resolve issues among the services, with less DOD intervention. GAO urges DOD to pursue the establishment of such a body but believes the body should address all deep attack requirements, not just air-to-surface requirements.

GAO has considered DOD's efforts to improve its processes. In the recent past, GAO has examined in considerable depth DOD's requirements, acquisition, and oversight processes.[7] While GAO acknowledges DOD's efforts and progress to date in improving those processes, the problems discussed in this report of optimistic funding projections, inflated requirements, overlapping and duplicative programs, and service-unique programs continue. As GAO points out in the report, DOD needs to reexamine the oversight process in ways aimed at providing more discipline and fewer programs in order to be able to procure its requirements in the most cost-effective manner.

DOD officials told GAO that, due to the mismatch between commitments and resources, DOD plans to reduce fiscal year 2000 procurement quantities for several guided weapon programs. GAO believes that reductions in annual procurement quantities and stretch-outs in procurement schedules should not be the inevitable solutions to the mismatch between its commitments to programs and expected resources. It is important that every effort should be made to avoid these "pay more for less" outcomes.

DOD's comments on the draft report are included in their entirety in appendix I with GAO's responses.

[7]High Risk Series: Defense Weapon Systems Acquisition (GAO/HR-97-6, Feb. 1997) and Combat Air Power: Joint Mission Assessments Needed Before Making Program and Budget Decisions (GAO/NSIAD-96-177, Sept. 20, 1996).

Contents

Abbreviations

AGM	Air-to-Ground Guided Missile
ATACMS	Army Tactical Missile System
BAT	Brilliant Anti-Armor Submunition
BLU	Bomb/Live Unit
CALCM	Conventional Air-Launched Cruise Missile
CEM	combined effects munition
CINC	Commander in Chief
DIA	Defense Intelligence Agency
DOD	Department of Defense
GAM	GPS-Aided Munition
GBU	Guided Bomb Unit
GPS	Global Positioning System
HARM	High Speed Antiradiation Missile
JASSM	Joint Air-to-Surface Standoff Missile
JCS	Joint Chiefs of Staff
JDAM	Joint Direct Attack Munition
JROC	Joint Requirements Oversight Council
JSOW	Joint Standoff Weapon
SFW	Sensor Fuzed Weapon
SLAM	Standoff Land Attack Missile
SLAM-ER	Standoff Land Attack Missile-Expanded Response
TASM	Tomahawk Anti-Ship Missile
TLAM	Tomahawk Land Attack Missile
WCMD	Wind-Corrected Munitions Dispenser

Introduction

Following the Persian Gulf War, the Department of Defense (DOD) identified a number of problems with its deep attack weapons and suggested improvements designed to ensure target destruction with minimum casualties, delivery sorties, weapons, and unwanted collateral damage. In response, the services initiated a number of programs to upgrade existing guided weapons and to acquire new ones. However, because the defense budget, in accordance with the balanced budget agreement, is likely to be relatively fixed for the foreseeable future, Congress expressed concern about the need and affordability of all these programs.

Background

The Joint Chiefs of Staff (JCS) acknowledge that they are facing flat budgets and increasingly expensive readiness and modernization and that to retain effectiveness, the services must integrate their capabilities. The JCS anticipate leveraging technological opportunities to reach new levels of effectiveness in joint military operations.[1] The current military doctrine also recognizes that new technologies are a key component in increasing the effectiveness of military operations. Guided weapons play an important role in implementing this doctrine.

Guided weapons are more accurate than unguided weapons because they have the capability for in-flight guidance correction. They can be powered or unpowered. The range from which they can be launched varies from a few miles for the unpowered Guided Bomb Unit (GBU) series of weapons to several hundred miles for the Tomahawk cruise missile and the Conventional Air-Launched Cruise Missile (CALCM). Most guided weapons are launched from aircraft or helicopters, but the Tomahawk is launched from Navy surface ships and submarines; and the Army Tactical Missile System (ATACMS) is launched from the Multiple Launch Rocket System. They can be guided by the Global Positioning System (GPS), infrared sensors, electro-optical sensors, or lasers. Some weapons have single warheads, others carry many antipersonnel or antiarmor submunitions.

The specific guided weapon used depends on the type of target, the defenses around the target, and whether areas adjacent to the target must be avoided. Deep attack guided weapons are used for operations carried out beyond the areas where friendly ground forces are operating. These weapons can be released very close to the target or at standoff ranges many miles from the target, either vertically or horizontally. "Standoff" range is the distance between the weapon launcher and the target.

[1] Joint Vision 2010, America's Military: Preparing for Tomorrow, Joint Chiefs of Staff.

Persian Gulf War, Lessons Learned

Guided weapons were first used in the Vietnam War to destroy targets that previously required tons of unguided general purpose weapons. However, guided weapons proved their value in the Persian Gulf War, when the world watched them make precision attacks against targets in Iraq. Guided weapons were subsequently recognized as having the potential to revolutionize warfare.

Before the Gulf War, aircrew training focused on a potential Central European conflict and emphasized low-altitude tactics using aircraft and weapons designed for such missions. However, Iraqi air defenses included large numbers of antiaircraft artillery that could put up a "wall of iron" against low-flying aircraft. After several aircraft losses, and to avoid the risk of losing a B-52H to antiaircraft artillery, pilots were ordered to drop weapons from higher altitudes than anticipated. At these altitudes, however, bombing with general purpose bombs was not accurate, and wind forces became a factor. While guided weapons achieved better results, a relatively small number of them were used, and their effectiveness was often limited by weather, target location uncertainty, and other factors.[2] As a consequence, bombing accuracy was poor, and multiple weapons—in some cases multiple attacks—were used on each target. Incomplete and delayed bomb damage assessments were also a factor in the need for multiple attacks.

Following the Gulf War, several DOD studies identified a number of changes that could improve the accuracy, standoff range, and lethality of its guided weapons as well as target identification and damage assessment capabilities. The aim of these improvements is to ensure target destruction with the minimum number of delivery sorties and weapons and to avoid unwanted collateral damage and minimize exposure of friendly aircraft to enemy defenses.

In response, the services initiated a number of programs to upgrade existing guided weapons—such as CALCM, the Tomahawk cruise missile, the Standoff Land Attack Missile (SLAM), and Air-to-Ground Guided Missile (AGM) 130—and to acquire new guided weapons, including the Joint Direct Attack Munition (JDAM), the Wind-Corrected Munition Dispenser (WCMD), the Joint Standoff Weapon (JSOW), and the Joint Air-to-Surface Standoff Missile (JASSM). Still more guided weapon programs are planned.

To take full advantage of new and improved guided weapons, launch aircraft capabilities are improving. More than nine times as many F-16s

[2]Operation Desert Storm: Evaluation of the Air Campaign (GAO/NSIAD-97-134, June 12, 1997).

and many more F-15E fighters can employ guided weapons today than in 1991. All DOD combat aircraft will be able to use GPS by the end of fiscal year 2000 (GPS allows precise positioning and navigation and permits weapon release in all types of weather). Additionally, the number of aircraft with night-fighting and target acquisition capabilities has increased significantly since fiscal year 1991. Currently, more than 600 Air Force fighters can use all or part of the Low-Altitude Navigation Targeting Infrared for Night System, and hundreds of Navy F/A-18 aircraft have forward-looking infrared pods for night vision.

Recent Studies and Reports on Guided Weapon Issues

DOD's management of its guided weapon capabilities, requirements, and acquisition programs has been of interest to Congress and others for many years. In 1995, we reported that the services had bought or were developing 33 types of guided weapons with over 300,000 individual weapons to attack surface targets.[3] We also stated that the services had initiated development programs both to increase the number of guided weapons and to gain additional capability through technical improvements to weapons in the inventory.

The 1995 Report of the Commission on Roles and Missions of the Armed Forces recommended an assessment of the services' deep attack systems to determine the appropriate force size and mix. The report questioned whether DOD had the right mix, asserted that DOD may have greater quantities of deep attack weapon systems than it needs, and recommended a DOD-wide cost-effectiveness study to determine the appropriate mix. The report concluded that "only by approaching capabilities in the aggregate, from the Commanders in Chiefs' (CINC) perspective rather than the services', can this particular 'who needs what' question be answered."

The 1996 National Defense Authorization Act[4] required DOD to report to Congress on (1) the process for approving development of guided weapons, (2) the feasibility of the services' jointly developing weapons and integrating them in multiple aircraft, and (3) the cost-effectiveness of developing interim weapons or of procuring small quantities of weapons. DOD was also asked to provide a quantitative analysis of deep attack weapons mix options. In April 1996, the Secretary of Defense issued a

[3]Weapons Acquisition: Precision Guided Munitions in Inventory, Production, and Development (GAO/NSIAD-95-95, June 23, 1995).

[4]P.L. 104-106, sec. 261.

report[5] informing Congress of the steps DOD was taking to avoid duplicate and redundant guided weapon programs and explaining how requirements and inventory levels were being determined. DOD also responded to congressional concerns regarding the economy and effectiveness of the continued acquisition of smaller quantities of some guided weapons whose unit costs had increased over 50 percent since December 1, 1991. DOD's report to Congress is discussed in chapter 5.

In May 1997, DOD issued its report on the Quadrennial Defense Review.[6] The review was a comprehensive examination of America's defense needs from 1997 to 2015 and included military modernization programs and strategy. It was intended to serve as DOD's overall strategic planning document and made several recommendations involving guided weapons modernization programs. In November 1997, DOD reported on the results of its Deep Attack Weapons Mix Study.[7] The results of this study and the recommendations of the review are discussed in chapter 4.

In December 1997, the National Defense Panel reported on its congressionally directed assessment of DOD's Quadrennial Defense Review. The Panel considered the review a significant step in the adjustment of U.S. forces to reflect the collapse of the Warsaw Pact. However, the Panel differed over emphasis or priorities in a number of areas. We discuss the Panel's assessment in chapter 5.

Objectives, Scope, and Methodology

In response to the request of the Chairmen of the National Security Subcommittee, House Committee on Appropriations, and of the Subcommittee on Military Research and Development, House Committee on National Security, we sought to determine whether

- the services' plans for developing and/or procuring guided weapons can be carried out as proposed within relatively fixed defense budgets,
- the number of guided weapons the services plan to buy are consistent with projected threats and modernization requirements,
- the current and planned guided weapon programs duplicate or overlap each other, and

[5]Precision Guided Munitions Acquisitions Process Report, April 1996.

[6]The review was required by the Military Force Structure Review Act (P.L. 104-201, sec. 923).

[7]The results of the study were issued in November 1997 in two parts. Part 1 is the Weapons Mix Analysis, which we discuss in this report. Part 2 is the B-2 Force Tradeoff Analysis, which was directed by the President.

- DOD is providing effective oversight in the development and procurement of deep attack weapons.

To determine whether the services' plans for developing and/or procuring guided weapons can be carried out as proposed within expected defense budgets, we obtained program cost and schedule information from weapon program offices and compared current weapon procurement plans with previous procurement history. We discussed and obtained copies of weapon program plans at the Aeronautical Systems Center, Eglin Air Force Base, Florida; Ogden Air Logistic Center, Hill Air Force Base, Utah; and Naval Air Warfare Center, Point Mugu Naval Air Weapons Station, California.

To determine whether the numbers of guided weapons the services plan to buy are consistent with projected threats and modernization requirements, we obtained information on DOD's weapons inventories from the Office of the Joint Chiefs of Staff, Washington, D.C. We reviewed the Navy's nonnuclear ordnance requirement process and the Air Force's nonnuclear consumables annual analysis model with personnel from those offices in Washington, D.C. Worldwide threat information was obtained from the Defense Intelligence Agency, Washington, D.C. We discussed targeting procedures and weapon employment tactics with officials at the U.S. Central Command and Navy Central Command, MacDill Air Force Base, Florida, and the Air Force Central Command, Shaw Air Force Base, South Carolina. We also obtained and analyzed information from the Commander of U.S. Forces Korea on guided weapon requirements, capabilities, tactics, and operational plans. We visited the Office of the Joint Chiefs of Staff to determine its role in establishing weapon requirements, and we discussed out-year threats with personnel from the Defense Intelligence Agency, Washington, D.C. We also had discussions with DOD Inspector General personnel who were auditing the Navy and the Air Force requirements models.

To determine whether current and planned guided weapon programs are duplicative and/or overlapping, we compared weapon capabilities such as range, potential target sets, and warhead types of similar weapons. In the course of this examination, we visited the JASSM program office at Eglin Air Force Base, Florida; the JSOW program office at Patuxent River Naval Air Station, Maryland; and the Standoff Land Attack Missile—Expanded Response (SLAM-ER) test site at Naval Air Warfare Center, Point Mugu Naval Air Weapons Station, California. We also discussed acquisition responsibilities with personnel from the Office of the Joint Chiefs of Staff

and the Navy Aviation Requirements Branch, Washington, D.C., and the Air Combat Command, Langley Air Force Base, Virginia.

To assess DOD's oversight of the services' deep attack weapon requirements and acquisition programs, we evaluated oversight processes and procedures in place and the extent to which guided weapon requirements and programs were assessed in the aggregate. We discussed the effectiveness of the current oversight processes—as well as alternative processes—with officials from the Joint Chiefs of Staff and the Office of the Under Secretary of Defense (Acquisition & Technology). We also reviewed DOD's Deep Attack Weapons Mix Study and obtained documents and interviewed officials from the Office of the Joint Chiefs of Staff; Office of the Under Secretary of Defense (Comptroller/Chief Financial Officer), Program Analysis and Evaluation directorate; and the Institute for Defense Analyses.

We conducted our audit work from July 1997 through October 1998 in accordance with generally accepted government auditing standards.

Acquisition Plans for Guided Weapons Based on Optimistic Funding Projections

To acquire the guided weapons now planned during fiscal years 1998-2007, DOD plans to spend about $16.6 billion (then-year dollars) for 158,800 weapons—doubling its average yearly spending compared with fiscal years 1993-97. The current investment strategy for guided weapons may not be executable as proposed because of the potential imbalance between funds likely to be available for actual procurement and projected spending. The projected imbalance may be greater than it appears because acquisition programs have traditionally cost more than originally projected, and several other weapons programs are expected to be approved for procurement. Furthermore, technology improvements will likely offer better weapon investments in the years ahead, generating even more programs to compete for the same resources.

In the past, when faced with similar funding shortfalls, DOD's approach has been to stretch out programs, delay procurement, and reduce annual production quantities. These strategies increased unit production costs and delayed deliveries. They could also limit DOD's flexibility to shift resources from older weapons to more innovative systems.

DOD's Acquisition Plans for Guided Weapons Are Ambitious

According to the fiscal year 1999-2003 Future Years Defense Program and longer-term program plans, the services plan to continue procuring guided weapon systems now in low-rate initial or full-rate production such as WCMD, JDAM, the Sensor Fuzed Weapon (SFW), SLAM-ER, the Baseline version of JSOW, the ATACMS Block I, and the Longbow Hellfire missile. The services also plan to begin production of several guided weapon systems now under development. These include JASSM, the Brilliant Antiarmor (BAT) submunition, the Bomb/Live Unit (BLU)-108 and Unitary versions of JSOW, and the ATACMS Block II and IIA. For about 127,000 of the 158,800 guided weapons to be acquired, a guidance kit will be added to an existing unguided weapon. These weapons include JDAM and WCMD.

As shown in table 2.1, these programs range in dollar value from the $26-million procurement of AGM-130s to the $3.3-billion procurement of the ATACMS Block II and IIA, which includes the BAT submunition. Nine of these programs are expected to cost over $1 billion each.

Table 2.1: Planned Guided Weapon Procurement Programs (fiscal years 1998-2007)

Dollars in millions (then-year)

Weapon systems[a]	Planned production costs	Planned production quantity
ATACMS Block II/IIA[b]	$3,335	1,806
JSOW/Unitary	1,692	3,194
Longbow Hellfire	1,643	11,497
JSOW/Baseline and BLU-108 (Navy)	1,639	6,536
JSOW/Baseline and BLU-108 (Air Force)	1,356	4,496
JDAM (Air Force)	1,336	61,063
Tomahawk[c]	1,278	1,253
JASSM	1,278	2,245
SFW	1,150	[d]
WCMD	508	40,000
JDAM (Navy)	641	25,496
ATACMS Block 1A	392	406
SLAM-ER	265	423
Tomahawk Land Attack Missile (TLAM)	54	100
GBU-28	36	255
AGM-130	26	30
Total	**$16,629**	**158,800**

[a]The Air Force plans to convert additional Air-Launched Cruise Missiles to a conventional attack role, but the quantities and costs are classified.

[b]Includes the estimated procurement cost of $1.8 billion for 19,700 BAT submunitions.

[c]Reflects the Navy's plan to acquire a new Tactical Tomahawk.

[d]SFW quantities (3,413 units) are included in the WCMD total.

According to their procurement plans, the services plan to spend an average of $1.7 billion a year to procure guided weapons over the next 10 years—doubling the $848-million average yearly spending during fiscal years 1993-97. Figure 2.1 shows the planned annual procurement funding for guided weapons during fiscal years 1998-2007.

Figure 2.1: Planned Guided Weapon Procurement Funding (fiscal years 1998-2007)

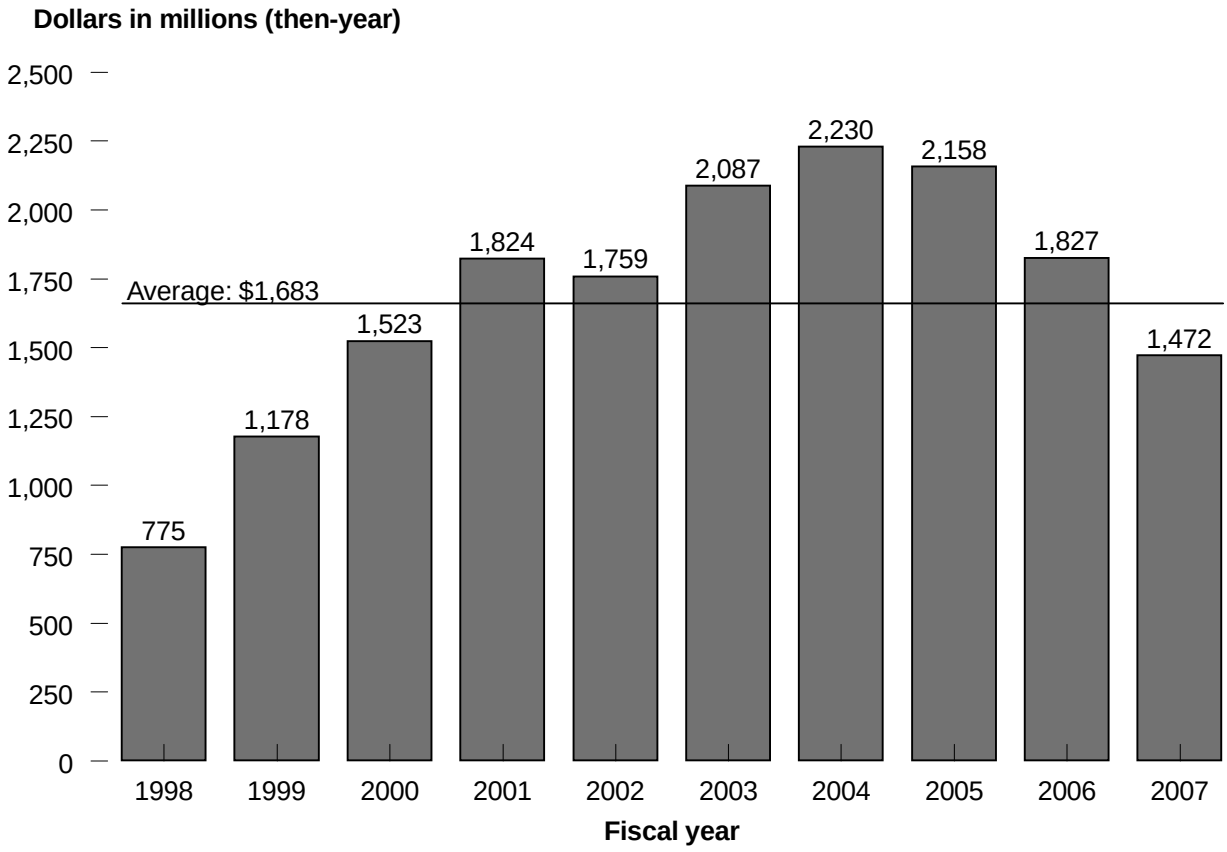


Table 2.1 and figure 2.1 do not include all of the costs for the services' planned modifications or upgrades to several existing guided weapons. For example, the Air Force and the Navy plan to equip approximately 500 GBU-24s and 500 GBU-27s with GPS guidance (which guides the weapon more accurately under all weather conditions). Additional quantities of these weapons may be upgraded in the future.

Also, table 2.1 and figure 2.1 do not include funding requirements for proposed guided weapon programs that have not yet been approved for procurement. For example, DOD has potential requirements for the Small Smart Bomb, Low Cost Autonomous Attack System, Unmanned Combat Air Vehicles, Land Attack Standard Missile, and the Navy's Vertical Gun.

Further, rapidly evolving weapons technology could offer better weapon investments in the years ahead, generating even more programs to compete for the same resources.

Last, acquisition programs, including guided weapon programs, have historically cost more than originally projected. Unanticipated cost growth has averaged at least 20 percent over the life of acquisition programs.[1] Any cost growth in DOD's guided weapon programs will increase the amount of funding needed to support them. (In the 1999 Future Years Defense Program, DOD included an acquisition program stability reserve to address unforeseeable cost growth that can result from technical risk and uncertainty. We have not evaluated the program stability reserve or the way DOD plans to implement it. However, the fund is budgeted at about $2.4 billion for fiscal years 2000-2003 to address possible cost growth in all defense programs. Further, the services are attempting to manage cost growth through initiatives such as "cost as an independent variable." We have not evaluated the effectiveness of these initiatives.)

Availability of Funding Needed for Guided Weapon Procurement Programs Is Uncertain

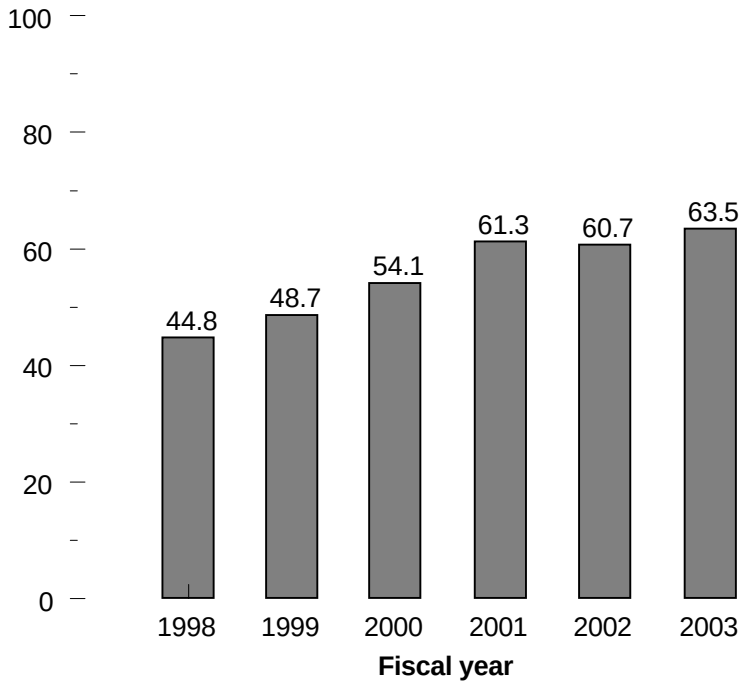
DOD's planned investment strategy for guided weapons is based on projections of increased procurement funding, as shown in figure 2.2, even though DOD's overall budget is expected to remain relatively fixed. In the balanced budget agreement, the President and Congress agreed that the total national defense budget[2] will remain relatively fixed in real terms at least through fiscal year 2002. While Congress has not discussed the defense budget beyond fiscal year 2002, DOD officials said their long-term planning now assumes no real growth in the defense budget.

Within a relatively fixed defense budget, any proposed increase in spending for a particular account or project must be offset elsewhere. However, DOD has not identified specific budget reductions to offset the proposed increases in procurement funding for guided weapons. Furthermore, DOD's other procurement programs, such as aircraft, shipbuilding, and missile defense, are also anticipating increases in procurement funding.

[1]CBO Papers: An Analysis of the Administration's Future Years Defense Program for 1995-99 Congressional Budget Office, January 1995 and The Effects of Management Initiatives on the Cost and Schedules of Defense Acquisition Programs, Institute for Defense Analyses, November 1992.

[2]The national defense budget includes the military activities of DOD, the atomic energy defense activities of the Department of Energy, and defense-related activities of other agencies.

Figure 2.2: DOD's Planned Procurement Funding During Fiscal Years 1998-2003



DOD expects to increase its overall procurement spending to about $63.5 billion in fiscal year 2003 from the fiscal year 1998 level of about $44.8 billion while keeping overall defense spending at current levels at least through fiscal year 2003. This is an increase of about 42 percent. DOD's planned procurement spending for guided weapon programs is projected to increase about 169 percent during the same period.

To increase procurement funding and keep overall defense spending unchanged, DOD proposes to reduce personnel, make some modest changes in force structure, achieve infrastructure savings through fundamental reforms and base realignments/closures, and continue to improve its business operations. However, we recently reported that by 2002, funding for military personnel, operations and maintenance, and research, development, testing, and evaluation is projected to be higher while procurement funding is projected to be lower than anticipated.[3] And

[3]Future Years Defense Program: DOD's 1998 Plan Has Substantial Risk in Execution (GAO/NSIAD-98-26, Oct. 23, 1997).

for the fourth straight budget year, DOD in 1998 did not achieve the procurement goals established in the previous Future Years Defense Programs. DOD consistently projects increased procurement funding for the latter years in each Future Years Defense Program but, as subsequent Future Years Defense Programs are developed, significantly reduces those projections in response to budget-year realities.

Savings from infrastructure reductions too often have not been as high as anticipated and have been absorbed by unplanned or underestimated expenses in day-to-day operations. According to DOD, the most common underestimated expenses are for depot and real property maintenance, military construction, and medical care. Because of unrealized savings, weapons modernization plans have repeatedly been underfunded.

In its review of the Quadrennial Defense Review, the National Defense Panel concluded that DOD's modernization plan has more budget risk than it acknowledges. The Panel considered DOD's key assumptions for maintaining a $60-billion annual procurement goal somewhat tenuous and concluded that, collectively, the assumptions represent a budget risk that could potentially undermine DOD's entire strategy.

Optimistic Funding Projections Have Often Led to Schedule Stretch-Outs and Higher Unit Costs

Weapon programs have typically projected annual procurement quantities and costs based on optimistic assumptions about funding availability. Our work has shown that the funds actually made available for procurement have often been much less than those projected when the program was proposed. When faced with funding shortfalls, DOD's traditional approach has been to reduce annual procurement quantities and extend production schedules, without eliminating programs. Such actions have usually resulted in significantly higher average unit procurement costs and delayed deliveries to operational units. For example, in 1997, we reported that production costs for 17 of 22 weapon systems we reviewed had increased by $10 billion (fiscal year 1996 dollars) above original estimates through fiscal year 1996 because completion of the weapons' production had been extended an average of 8 years (170 percent) longer than originally planned.[4] We found that actual production rates averaged less than half the originally planned rates. These stretch-outs were caused primarily by funding limitations.

[4]Weapons Acquisition: Better Use of Limited DOD Acquisition Funding Would Reduce Costs (GAO/NSIAD-97-23, Feb. 13, 1997).

The services' procurement of guided weapons between fiscal year 1993 and 1998 also had higher unit costs because of schedule slippage, reduced procurement quantities, and cost growth. For example, the Air Force at one time planned to procure about 4,000 AGM-130s but now plans to buy only 711. As a result, the unit procurement cost is about $832,000 versus earlier projections of under $300,000. Reductions in planned procurement funding for the SFW have forced the program to reduce annual procurement rates and stretch out the schedule. As a result, SFW unit costs have increased from about $320,000 to over $358,000. The BAT program has also been unstable, and its schedule has been extended by 5 years. BAT's procurement quantities have also dropped by 36 percent, while program costs have increased by almost 8 percent.

DOD Requirements for Guided Weapons Appear to Be Inflated

The existing inventory of 1.3 million weapons, which could be used for deep attack, contains many guided munitions and hundreds of thousands of general purpose bombs. The current inventory is considered sufficient to meet current national defense objectives. The deep attack weapons used in the Gulf War would represent about 17 percent of the current inventory. Yet DOD plans to add 158,800 guided weapons over the next 10 years, almost doubling its existing inventory of guided weapons. DOD expects the new weapons to enable warfighters to accomplish the same objectives with fewer weapons and casualties and less unintended collateral damage. We believe some new weapons may indeed be needed to resolve specific performance problems and to replace those retired or used in training. However, since DOD has not prepared an overall requirements estimate for weapons capable of deep attack (see chs. 4 and 5), we question DOD's rationale for nearly doubling its inventory of guided weapons.

The higher projected effectiveness of these new systems—in terms of accuracy, standoff range, and lethality—along with the employment of advanced tactics is expected to allow wartime objectives to be accomplished with fewer weapons. Further, changing world conditions have altered, perhaps for many years, the nature of the threats to U.S. interests. However, we believe the assumptions used by the services to estimate individual weapon requirements are conservative, overstate the potential threat and target base, favor long range and accurate guided weapons, and require large quantities of reserve weapons. As a result, the quantity requirements for guided weapons appear to be inflated, particularly in today's budgetary and security environments.

DOD's Current Inventory Is Considered Adequate to Meet Defense Needs

DOD retains about 1.3 million weapons that could be used for deep attack missions. They range from the accurate, long-range Tomahawk cruise missiles to hundreds of thousands of relatively inexpensive general purpose bombs. The total inventory of these weapons today is about 15 percent smaller than it was in 1992, soon after the end of the Cold War. Guided weapons currently account for about 12 percent of the total inventory of deep attack weapons. The guided weapons on hand or in procurement totaled over 170,000 units as of the end of fiscal year 1997. The current inventory includes AGM-130, AGM-142, CALCM, Harpoon, GBU-10, GBU-12, GBU-15, GBU-24, GBU-27, GBU-28, Maverick, SFW, ATACMS Block I, Hellfire II, High-Speed Anti-Radiation Missile (HARM), SLAM, Tomahawk Anti-Ship Missile (TASM), and Tomahawk Land Attack Missile (TLAM). As discussed in chapter 2, the services plan to add about 158,800 guided

weapons to the existing inventory through fiscal year 2007. Although some weapons would be used for testing, training, and other purposes, planned acquisitions would approximately double the current inventory.

To place the existing inventory in perspective, about 227,000 deep attack weapons, or about 17 percent of the current inventory, were used in the Persian Gulf air war. Of these weapons, 92 percent were unguided and 8 percent were guided. Of the guided weapons used, about half were laser-guided (GBU-10, 12, and 24) and the remainder used other types of guidance such as preprogrammed maps for the Tomahawk and an electro-optical sensor for the Maverick.

According to two recent Defense studies and discussions with U.S. Central Command officials, the current inventory of guided and unguided weapons is sufficient to accomplish current defense objectives. The national defense strategy directs the services to retain the capability to fight and win two overlapping major theater wars. Two regions containing significant military threats to U.S. interests are (1) East Asia and the Pacific Rim with its increased strategic significance and (2) the Middle East and South Asia where the United States has vital and enduring interests.

We believe some new weapons may indeed be needed to resolve specific performance problems and to replace those retired or used in training. The services, however, justify each of their weapon acquisition programs on a case-by-case basis, and DOD does not assess the DOD-wide capabilities and programs on an aggregate basis. Moreover, an overall requirements estimate for weapons capable of deep attack has not been established. As a result, DOD has not specifically justified doubling its inventory of guided weapons, as the services' current acquisition plans would do.

Modern Guided Weapons Have Been Justified as Significantly More Effective

New and improved guided weapons are expected to enable warfighting objectives to be accomplished with fewer weapons, lower aircraft attrition, and less unintended damage. Major improvements are projected in the areas of accuracy, standoff range, and lethality. A study by the Center For Naval Analysis examined the potential impact of guided weapons on the battlefield and concluded that substantially fewer weapons would be required when guided weapons are used extensively. The study estimated that guided weapons offer a 10 to 1 advantage over unguided general purpose bombs for strategic targets such as airfields or chemical storage facilities and about a 20 to 1 advantage for battlefield

targets such as armored vehicles and rocket launchers. Projecting these efficiencies to the Gulf War, the study estimated that had guided weapons been used extensively, the same damage levels could have been achieved with 60 percent fewer weapons. Other recent studies have come to similar conclusions. A Rand study, for example, found that for most targeting situations, one guided weapon could achieve the same destruction as 35 unguided weapons.

In our 1997 report, we discussed the use and effectiveness of guided and unguided weapons and other aspects of the air campaign during the Gulf War. Both guided and unguided weapons were less effective than expected because, among other things, (1) higher altitude deliveries were used to avoid Iraqi air defenses, (2) aircraft sensors had inherent limitations in identifying and acquiring targets, (3) DOD failed to gather intelligence information on some critical targets, and (4) DOD was unable to collect and disseminate timely battle damage assessments. DOD has undertaken initiatives since the war to address many of these problems, including the introduction of specific design features for new guided weapons. However, the effectiveness of some of the new guided weapons has not yet been fully demonstrated. Nevertheless, DOD projects that its new guided weapons will significantly improve warfighting capability in the areas of accuracy, standoff range, and lethality.

Accuracy

Accuracy is an important element of a weapon's effectiveness. A more accurate weapon can be smaller and carry less explosive power and yet still achieve desired damage levels. Since the Gulf War, the services have been acquiring GPS-based guidance kits for existing weapons (such as AGM-130, SLAM-ER, JDAM, and Tomahawk) and integrating this technology into new weapons (such as JSOW and JASSM) to improve accuracy from higher altitudes and greater distances and in bad weather. GPS is a global, day-night, all-weather, space-based navigation system that can provide highly accurate position, velocity, and time information to both civilian and military users. For military users, GPS is accurate to 9 to 12 meters and insensitive to weather or battlefield conditions. By using auxiliary systems such as ground based locators, the accuracy of GPS-based guidance systems can be further improved.

Under the JDAM program, GPS guidance systems are being added to over 86,000 unguided bombs. Some laser-guided bombs and long-range cruise missiles like SLAM-ER, Tomahawk, and CALCM either have or are to receive GPS guidance systems. (Once in the target area, some weapons—such as

SLAM-ER and Tomahawk—use other guidance systems to more precisely attack their targets.) DOD also plans to acquire 7,800 new JSOW-unitary guided weapons and 2,400 new JASSMs with GPS-aided guidance systems.

The services are also developing new weapons with submunition dispensers that use GPS guidance to reach mobile armor and other targets. These include ATACMS and JSOW. These systems carry submunitions that autonomously identify and attack specific targets after they are released in the battle area.

Standoff Range

Standoff range, as used in this report, is the distance between the launch vehicle and the target. Greater standoff range is important for the survival of the launch vehicle when enemy defenses are active in the target area. Some powered guided weapons such as CALCM and SLAM-ER have a standoff range of well over 100 miles, providing a high degree of launch vehicle safety. Launch vehicle safety is also enhanced by JSOW's long glide range, which enables launch aircraft to stand off outside the range of most target-area surface-to-air threat systems. Some protection is also obtained from antiaircraft guns and hand-held missile launchers through medium altitude launches of unpowered weapons such as JDAM. Similarly, the Air Force's WCMD kit is expected to provide some protection for launch aircraft from medium altitudes.

Lethality

In addition to better accuracy and longer range, the services are increasing the lethality of guided weapons by improving warhead cases and fuzes. This is accomplished by designing warhead cases that can withstand high-velocity impact and penetrate earth, reinforced concrete, and other barriers to reach a protected target before exploding. Unitary and submunition warheads are also being designed to maximize their blast effects on or above the battlefield, and improved fuze technology is expected to provide more control over warhead detonation. For example, modern warheads and fuzes can destroy a command bunker or an aircraft shelter by penetrating the protective structure and then exploding. Similarly, a warhead can be detonated above the battlefield to destroy a missile site, radar, or fuel cell. In addition, submunitions have been developed that are expected to autonomously identify and attack separate armored vehicles. Specially designed submunition dispensers and carriers have been developed to carry and launch submunitions over the target area. Such improvements to weapon lethality are expected to act as force multipliers, allowing fewer weapons to achieve the results of many.

Increased Effectiveness of Weapons Is Expected to Permit the Use of Advanced Tactics

The improved accuracy and lethality of the new deep attack weapons are expected to facilitate the use of advanced tactics, such as nodal targeting. Nodal targeting can be defined as attacking critical infrastructure targets that cripple an adversary's capability to attack with its forces. Nodal targets could include, for example, command centers, power plants, or logistics choke points such as bridges. Such tactics are also expected to reduce unwanted collateral damage and post-war reconstruction hardships. For example, to destroy a power plant in Iraq during the Gulf War, several 1-ton bombs were dropped over a 3-day period. The facility was completely destroyed, causing significant hardship to the residents of the neighboring town. Air Force officials told us they could have achieved the same objectives using one accurate weapon, thus allowing the facility to be repaired more quickly after the war. This strategy is possible only if there is high confidence in the precise location of the targets and the accuracy and the amount of damage that can be achieved from a given weapon. With its modern guided weapons and better battlefield information, DOD hopes to have this confidence in future conflicts.

Changing World Conditions Have Altered the Nature of Threats to U.S. Interests

Recent international trends, according to the Defense Intelligence Agency (DIA), argue against the likelihood of a large-scale regional war in the foreseeable future. The most pressing current challenges (terrorism, narcotics trafficking, and other criminal activity with national security implications) and the biggest emerging threats (weapons of mass destruction and missile proliferation) have limited use as the basis for sizing and defining future force requirements. Instead, it is more probable that U.S. involvement will occur along the lower end of the conflict spectrum with military assistance, various peacekeeping contingencies, or operations other than war. Limited local or regional conflicts may also occur.

The DIA Director reported to Congress in February 1997 (and reiterated again in January 1998) that the world is in the midst of an extended post-Cold War transition that will last at least another decade. From a national security standpoint, the threats facing the United States have diminished by an order of magnitude, and the Director believes the United States is unlikely to face a global military challenger on the scale of the former Soviet Union for at least the next two decades. World expenditures for military hardware are significantly less today than they were during the height of the Cold War. Despite these developments, the Director views this period of transition as complex and dangerous.

According to DIA, Iraq and North Korea are currently the most likely U.S. opponents in a major theater conflict, with weapons of mass destruction developing as an emerging threat.

- Iraq will remain a threat to U.S. regional policies and interests as long as the current government remains in power. However, its military capability continues to erode. There are significant weaknesses in leadership, morale, readiness, logistics, and training that would limit Iraq's effectiveness in combat. Iraq has rebuilt some key installations destroyed in the Gulf War, but their location, construction characteristics, and other factors are well known.
- North Korea is characterized as a failing state, and the potential for internal collapse, instability, and leadership change is rising. In the meantime, its overall military readiness continues to erode in line with its worsening economic situation.
- Some nations are building or acquiring weapons of mass destruction (i.e., nuclear, chemical, or biological weapons). Many states view the acquisition of these weapons as vital to countering U.S. conventional warfighting superiority and to providing a measure of power, respect, and deterrent value within a regional context. Chemical weapons are relatively easy to develop, deploy, and conceal and are based on readily available technology. The proliferation of weapons of mass destruction constitutes a direct threat to U.S. interests worldwide.

Services' Requirements Systems Inflate Quantities of Individual Weapons Needed

We believe the assumptions used by the services to estimate individual weapon requirements are conservative, overstate the potential threat and target base, favor long range and accurate guided weapons, and require large quantities of them among reserve weapons. As a result, the quantity requirements for each weapon appear to be inflated, particularly in today's budgetary and security environments.

The services use the capabilities-based munitions requirements process to determine their requirements for weapons procurement. Each year, the services analyze how many weapons and of what type are needed to fully support the CINCs' war plans and provide for post-war reserves, storage requirements, and other needs. These weapon requirements become the basis for the services' weapon procurement programs and budget requests.

The services rely on DIA to identify specific military targets in those regions specified in defense guidance for the period included in the Future Years Defense Program. The resulting out-year threat report is used by the

CINCs responsible for those regions to determine attack objectives for each type of target and to assign responsibility for target destruction to the services. Using this allocation of targets and destruction objectives, the services simulate combat to estimate the number of weapons needed.

Each of the services uses its own battle simulation models and other tools to determine the number of weapons needed to meet the CINCs war objectives. The models receive performance information for each type of weapon and delivery vehicle, as well as the construction characteristics of each type of target. The models then determine how many weapons of a specific type, delivered by a particular vehicle under various battle conditions, are needed to damage each target to a particular level. The factors influencing the modeling results include target lists and characteristics, weapon effectiveness, choice of weapons, and reserve requirements.

Target Lists

Despite DIA's projections on recent international trends, the sizable inventory of capable weapons, and the current budgetary situation, the services determine their weapons requirements and, in turn, the weapons to be acquired each year using worst-case scenarios for each of the two major theaters of war. Navy and Air Force requirements models include nearly all the targets identified in the regions specified by defense guidance. The target list includes thousands of mobile targets, including ships, surface-to-air missile batteries, armored combat vehicles, tanks, aircraft, artillery, trucks, and troops on the battlefield. It also includes thousands of fixed targets such as airfields, bridges, buildings, port facilities, radar sites, and power plants.

Central Command officials told us it is unlikely that all or even most of the identified targets would be attacked in a potential war in Southwest Asia (in the case of the Gulf War, the targets struck represented only a small portion of all identified targets). DIA has prepared a smaller list of critical targets with the highest military value, but the Central Command includes nearly all of the identified targets in its most comprehensive war plans and service allocations.

We believe the effects of including such a large target base are significant. For example, the Air Force and the Navy estimate that the number of guided weapons needed to damage and/or destroy all the potential targets in the Central Command target base for Southwest Asia would be significantly higher than the number of guided weapons used during the

Gulf War. It should be noted, however, that only a small fraction of the target base was attacked during the Gulf War. Central Command and service officials explained that including nearly all targets in the service models may inflate weapon requirements, but they do not want to risk having insufficient weapons, should some unforeseen conflict require them. After examining the CINCs' target distribution in 1997, the DOD Inspector General reported that more needs to be done to improve the threat distribution input provided to the services for generating munitions requirements. Specifically, the Inspector General recommended that the CINCs establish procedures that (1) identify and include the capabilities of emerging weapons, (2) identify post-major theater war missions, (3) distribute threats to coalition forces, and (4) establish procedures that document and coordinate the rationale for final threat distributions. Following the Inspector General's logic, we believe that using a smaller target list would reduce the number of weapons the services' models identify as required.

Choice of Weapons

The Air Force and Navy requirements models show a strong preference for using guided weapons against most targets. The models place a premium on avoiding any aircraft or aircrew losses or collateral damage. As a result, the models select weapons that are most effective in meeting those objectives. The weapons' target destruction capabilities and costs are secondary considerations.

The models tend to select the most accurate and longest standoff weapons, even though these may not have the best target-killing characteristics and may be much more costly than alternatives with better target-killing characteristics. For example, the Navy's model selects Tomahawk missiles, costing about $1 million each, for many types of targets, even against certain targets where its effectiveness is poor. While the specific situation may dictate the use of a Tomahawk due to target location or threat, other weapon choices could be more effective and less costly, if other factors such as aircraft attrition do not overcome the weapon's cost advantage.

According to service officials, this outcome reflects the models' tendency to use standoff weapons versus direct attack weapons (thereby avoiding enemy air defenses) and their preference for more accurate weapons. As a result, the models fail to recognize the full impact of defense suppression and may overstate the need for the more costly, highly precise standoff guided weapons. While these types of weapons are more effective against

some types of targets, direct attack guided weapons as well as unguided weapons are quite adequate against other targets, particularly when enemy defenses have been suppressed.

Reserve Requirements

The services' models also calculate the weapons needed by U.S. forces not directly engaged in major theaters of war and those needed to ensure U.S. forces are able to deter or, if necessary, fight a limited conflict following two major theaters of war. While these reserves represent only a portion of the total weapons requirement, they include several times more guided weapons than were used in the entire Gulf War. We believe strategic reserves of that magnitude are questionable in the current international security environment and would likely be reduced significantly if the models were revised to better reflect realistic target lists, weapon effectiveness factors, and choices of weapons.

Proliferation of Guided Weapon Capabilities and Acquisition Programs

DOD currently has substantial quantities of many different guided weapons to attack most, if not all, targets. Taken individually, DOD's acquisition plans for guided weapons can be justified and are expected to add significant capabilities. However, DOD reviews and justifies its deep attack weapon acquisition programs on a case-by-case basis and does not assess its existing and projected capabilities in this area on an aggregate basis. Although they are good candidates for joint programs, most of these new types of weapons are being integrated into only one service's platforms. When reviewing the services' currently planned programs in the aggregate, we found (1) widespread overlap and duplication of guided weapon types and capabilities, (2) questionable quantities being procured for each target class, and (3) a preference for longer standoff and more accurate weapons rather than for other options that may be as effective and less costly. When the services acquire multiple systems for similar purposes, they pay higher costs to develop, integrate, procure, and maintain these systems.

DOD's 1997 Deep Attack Weapons Mix Study was expected to critically review overall deep attack capabilities and to provide an analytical basis for recommendations about specific programs. However, the study stopped short of recognizing overlap and duplication and did not recommend curtailment or cancellation of any programs. DOD's Quadrennial Defense Review, which based its recommendations on the study's results, recommended that current acquisition plans for guided weapons continue with only modest adjustments. The Air Force, the Navy, and two DOD-sponsored independent reviews concluded that the computer models used in the study were outdated and did not adequately represent modern warfare. Accordingly, while we believe the study was certainly a step in the right direction, DOD still does not have a sound basis to ensure that it has the proper and cost-effective mix of deep attack weapon programs. While modeling plays a role, the ultimate decisions on that mix will require sound military and business judgment.

DOD Plans to Add to Its Capabilities to Attack All Classes of Targets

DOD categorizes ground and naval surface targets in five target classes. Two classes are for mobile targets—one for heavily armored targets such as tanks and artillery and a second for lightly armored or unprotected trucks, vans, and personnel. Two classes are for fixed targets—one for bridges and underground or heavily reinforced facilities and one for general purpose buildings, manufacturing facilities, roads, and rail yards. The fifth class is for maritime surface targets and includes ships at sea.[1]

[1]There are also target classes for airborne aircraft, tactical missiles, and maritime subsurface targets but they are not included in this review. DOD also has a target class for sites that emit radio frequency signals. However, when not emitting, these are considered in either the fixed or mobile soft classes.

DOD has several types of guided weapons in the inventory to attack each of the five target classes. DOD also has additional types of guided weapons in development and production to attack each of the five target classes. Table 4.1 lists the guided weapons in inventory, production, and development by target class. The list includes air-to-surface and surface-to-surface weapons.

Table 4.1: Guided Weapon Options by Target Class

Target class	In inventory	In production	In development
Mobile hard (includes tanks and artillery)	Maverick (AF/N) GBU-10 (AF/N) GBU-12 (AF/N) GBU-24 (AF/N) GBU-27 (AF) Walleye (N) GPS aided munition (AF) SFW (AF) Hellfire II (A)	SFW/WCMD (AF) Gator/WCMD (AF) JDAM (AF/N) Hellfire II (A) Longbow Hellfire (A)	ATACMS Block II/IIA /BAT Submunition /Improved BAT Submunition (A) JSOW/BLU-108 (AF/N)
Mobile soft (includes trucks, vans, and personnel carriers)	Maverick (AF/N) GBU-15 (AF) GAM (AF) TLAM (N) AGM-142 (AF) ATACMS Block I (A) Hellfire II (A) SFW /WCMD Gator/WCMD JSOW/Baseline (N/AF)	AGM-142 (AF) SFW/WCMD (AF) CEM/WCMD (AF) TLAM (N) JDAM (AF/N) JSOW Baseline (AF/N) ATACMS Block 1A (A) Hellfire II (A) Longbow Hellfire (A)	ATACMS Block II/IIA/BAT Submunition /Improved BAT Submunition (A) JSOW/BLU-108 (AF/N)
Fixed hard (includes bridges and underground or heavily reinforced facilities)	Maverick (AF/N) GBU-10 (AF/N) GBU-12 (AF/N) GBU-15 (AF) GBU-24 (AF/N) GBU-27 (AF) GBU-28 (AF) Walleye (N) GAM (AF) AGM-130 (AF) AGM-142 (AF) TLAM (N) SLAM (N)	AGM-130 (AF) AGM-142 (AF) GBU-28 (AF) TLAM (N) SLAM (N) SLAM-ER (N) JDAM (AF/N)	JSOW/Unitary (N) Tactical Tomahawk (N) SLAM-ER (N) JASSM (AF)

(continued)

Target class	In inventory	In production	In development
Fixed soft (includes general purpose buildings, manufacturing facilities, roads, and rail yards)	Maverick (AF/N) CALCM (AF) GBU-10 (AF/N) GBU-12 (AF/N) GBU-15 (AF) GBU-24 (AF/N) GBU-27 (AF) HARM (AF/N) Walleye (N) GAM (AF) AGM-130 (AF) AGM-142 (AF) TLAM (N) SLAM (N) ATACMS Block I (A)	AGM-130 (AF) ATACMS Block 1A (A) AGM-142 (AF) TLAM (N) SLAM (N) SLAM-ER (N) JDAM (AF/N) Gator/WCMD (AF) SFW/WCMD (AF) CEM/WCMD (AF) JSOW Baseline (AF/N)	ATACMS Block II/IIA/BAT Submunition/Improved BAT Submunition (A) JSOW/Unitary (N) Tactical Tomahawk (N) SLAM-ER (N) JASSM (AF)
Maritime surface (includes ships)	Maverick (AF/N) Harpoon (AF/N) Penguin (N) TASM (N) Walleye (N) GAM (AF) SLAM (N) AGM-142 (AF)	AGM-142 (AF) SLAM (N) SLAM-ER (N) JDAM (AF/N)	JSOW/Unitary (N) Tactical Tomahawk (N) SLAM-ER (N) JASSM (AF)

Note: The service or services that use each of the weapons are indicated in parentheses.
A = Army, N = Navy, AF = Air Force, and CEM = Combined Effects Munition.

According to Air Force and Navy officials, none of the guided weapons in the inventory will be retired in the foreseeable future.[2] The services are producing more types of available guided weapons and plan to add even more types when those currently under development transition to production.

Services Favor Single-Service Versus Joint Programs for Procurement of Guided Weapons

Most of the guided weapon types in the inventory or in production and development are expected to be used by only one service. While the JDAM, the BLU-108 and Baseline versions of JSOW, and the Hellfire are expected to be joint programs, all of the other development and production programs listed in table 4.1 involve only one service. Guided weapons are good candidates for joint programs because the services plan to use them for similar purposes and in similar ways. In addition, most guided weapons can be launched from several different platforms with relatively minor, if any, modifications.

[2]A small portion of the inventory of unguided weapons will be retired or converted to guided weapons.

Each service is responsible for identifying its own deficiencies in meeting the CINCs' target destruction allocations and for developing and obtaining approval of its mission need statements. If a service determines that a new weapon is required, its requirements branch establishes the operational requirements for the weapon. According to requirements personnel, both mission need and operational requirement documents are reviewed by the other services, making joint requirement plans possible. However, for most guided weapons now in development and production, a joint requirement either was not established or was not sustained.

For example, although the JASSM was designated as a joint program, Navy requirements officials have stated that the Navy does not currently plan to integrate the weapon in its aircraft and is not currently planning to buy any. Similarly, the Air Force plans to procure two JSOW variants (Baseline and BLU-108) but is not currently planning to integrate the Navy's Unitary variant of the JSOW in its aircraft and is not planning to buy any. Other single-service guided weapons (such as the WCMD and the SLAM-ER) could be modified and integrated for use with another service's platforms. But the services have not favored this option.

Questionable Acquisition Plans for Guided Weapons

DOD reviews and justifies its guided weapon acquisition programs on a case-by-case basis and does not assess its existing and projected capabilities in this area on an aggregate basis. When reviewing the services' currently planned programs from an aggregate perspective, we found (1) widespread overlap and duplication of guided weapon types and capabilities, (2) questionable quantities being procured for each target class, and (3) a preference for longer standoff and more accurate weapons rather than for options that may be as effective and less costly. Table 4.2 provides details of quantities, status, and production costs for the guided weapons planned to be acquired for use against four target classes.

Table 4.2: Capabilities Overlap in Guided Weapons

Target class	Munition	Status	Planned quantity	Unit production cost ($ in thousands)	Total estimated production cost ($ in millions)
Fixed hard Fixed soft	JSOW/Unitary (N)	Development	7,800	$509.4	$3,973.1
	JASSM (AF)	Development	2,400	537.0	1,288.8
	Tactical Tomahawk (N)	Development	1,253	1,120.8	1,404.4
	SLAM-ER (N)	Production	700[a]	709.1	496.4
Total			**12,153**		**$7,162.7**
Mobile hard	SFW/WCMD (AF)	Production	5,000	377.4[b]	1,887.1
	Gator/WCMD (AF)	Production	5,000	19.2[c]	96.1
	JSOW/BLU-108 (N/AF)	Development	4,200	366.9	1,540.8
	ATACMS Block II/BAT (A)		1,806	1,875.9	3,387.9
Total			**16,006**		**$6,911.9**
Fixed soft Fixed hard (area)	Combined Effects Munition CEM/WCMD (AF)	Production	30,000	19.2[c]	576.0
	JSOW/Baseline (N/F)	Production	11,800	225.3	2,658.0
	ATACMS Block 1A (A)	Production	652[d]	929.3	605.9
Total			**42,452**		**$3,839.9**

Note: The service or services that use each of the weapons are indicated in parentheses. A = Army, N = Navy, and AF = Air Force.

[a]Of the 700 units, 135 SLAM-ER were procured prior to fiscal year 1998.

[b]Includes Sensor Fuzed Weapon production costs.

[c]The CEM and Gator mine submunitions are already in the inventory.

[d]Of the 652, 237 ATACMS Block 1A were procured prior to fiscal year 1998.

Guided Weapons to Attack Fixed Targets

The total procurement cost for the Unitary version of the JSOW, JASSM, Tactical Tomahawk, and SLAM-ER is projected to be about $7.2 billion for 12,153 weapons. These weapons do not constitute all of the weapons potentially available against the fixed hard and soft target sets from a standoff distance. As shown in table 4.1, additional weapons such as the TLAM, AGM-130, AGM-142, and CALCM are also available.

Three weapons—SLAM-ER, Tactical Tomahawk, and JASSM—are designed to attack targets from outside the range of long-range enemy air defenses. A

fourth weapon, the Unitary variant of the JSOW, is a Navy-developed weapon designed to attack targets outside mid-range enemy air defenses. Each of these weapons will be used by a single service because only the developing service is currently planning to buy or integrate the weapon on its platforms.

Each of the weapons, considered alone, was justified by the services within DOD's system acquisition process as adding capability to the existing force. But considered in the aggregate and in terms of economy and efficiency, four new types of standoff guided weapons may not be needed to attack this target set in addition to other standoff guided weapons that are already available. The services also have several types of guided and unguided direct attack weapons that could be effectively used in a reduced threat environment against these targets. In addition, the Air Force has the F-117 stealth fighter for delivery of direct attack guided weapons against critical targets and has invested over $40 billion in the development and procurement of the B-2 bomber to penetrate heavily defended areas to attack high-value targets.

DOD's key directive on defense acquisition matters encourages modifying a current system to meet operational requirements before beginning development of a new system.[3] It would thus have been reasonable and technically feasible for the Navy to acquire additional SLAM-ERs in lieu of beginning development and production of the Unitary version of JSOW. Likewise, it would have been reasonable and technically feasible to modify SLAM-ER for the Air Force requirement for a long-range standoff weapon rather than develop and produce JASSM.

In addition, the need to add 12,153 new standoff guided weapons to those already in the inventory for this target set is questionable, particularly when the number of critical targets in defense guidance scenarios have declined and are projected to continue to do so. DOD has many guided weapons—mostly laser-guided bombs—in the inventory capable of attacking critical fixed targets. In addition to the new standoff weapons discussed above, DOD also plans to buy over 86,000 JDAMs (a direct attack weapon) for possible use against this same target set.

While the long-range, highly accurate, and expensive standoff weapons that DOD plans to procure are most effective in the early stages of a conflict—when enemy air defenses are expected to be most potent—they

[3]DOD Directive 5000.1, Defense Acquisition.

may not be needed in large numbers throughout an entire conflict.[4] As enemy air defenses decline, less costly but still accurate and effective direct attack weapons such as laser-guided bombs or JDAMs can be used. Using this generally accepted strategy, DOD developed a mix of weapons. However, the services plan to acquire both large numbers of new standoff guided weapons (2,400 JASSMs and 7,800 Unitary versions of JSOW) and new direct attack guided weapons (86,000 JDAMs and 40,000 WCMDs).

Furthermore, the services have not fully addressed the possibility of improving the accuracy of less costly direct attack guided weapons so as to reduce the number of more expensive standoff weapons. The Air Force planned to increase the accuracy of the JDAM, but the program is not currently funded. The Navy also expressed an interest in improving the JDAM's accuracy and has provided some funding for research. Both the Air Force and the Navy are funding an effort to add GPS to a limited number of GBU-24s and GBU-27s. The Air Force is buying some new GBU-28s with GPS guidance capability. DOD acknowledges the potential benefits of improving the accuracy of these guided weapons but has not assessed the potential effect on the numbers of weapons needed.

Guided Weapons for Attacking Area and Multiple Armored Targets

The weapons planned for attacking area targets[5] and multiple armored targets from medium ranges present a similar case of duplicative procurement plans when viewed in the aggregate. Together, the Army, the Navy, and the Air Force plan to buy over 58,000 weapons to attack these targets for an estimated cost of over $10.7 billion.

The Navy has begun production of the Baseline variant of JSOW, which can be used to attack area targets (such as runways and motor pools), and plans to start production in fiscal year 1999 of the BLU-108 variant, which can be used to attack multiple armored targets (such as tanks and armored personnel carriers). The Air Force and the Navy together plan to buy 16,000 of these two JSOW variants. However, since the JSOW variants were developed, the Air Force has also developed the WCMD tail kit for higher altitude release of weapons such as the SFW, the CEM, and the Gator mine munition. Each of these weapons, with the WCMD tail kit, can be used to attack the same target classes as the Baseline and BLU-108 versions of JSOW. The Air Force plans to buy 40,000 tail kits.

[4]A critical objective early in a conflict is to aggressively destroy and/or suppress the enemy's air defenses in order to minimize friendly aircraft losses. DOD plans to use highly accurate standoff weapons as well as high-speed antiradiation missiles and electronic attack assets in this role.

[5]An area target is a large parcel of ground on which there are many individual targets such as truck parks.

Also, the Army is buying 652 ATACMS Block IA missiles with antipersonnel, antimateriel submunitions for attacking area targets, and it is developing the BAT submunition to be carried in 1,806 ATACMS Block II/IIA missiles against multiple armored targets. With unit costs of about $929,300 for each ATACMS Block IA missile and $1.9 million for each ATACMS Block II/IIA missile with the BAT submunitions, these weapons are the most expensive of the three.

Each of these weapons has been justified as offering advantages, but when assessed in the aggregate, their combined capabilities overlap and duplicate each other and may be unnecessary, particularly when likely threats are in decline. In addition, the Air Force and the Navy have many Maverick missiles to attack individual armored targets after longer range air defenses are suppressed. The Army and the Marine Corps have procured over 13,000 Hellfire II missiles and plan to buy over 11,000 Longbow Hellfire missiles that could be used by attack helicopters against individual armored targets. Furthermore, the Army has procured over 1,800 ATACMS Block 1 missiles to attack area targets.

The 40,000 WCMD-equipped weapons are planned to be integrated only with Air Force aircraft. The Air Force configurations have several advantages over the Navy-developed JSOW variants: the WCMD/CEM variant for area targets costs less per unit[6] ($19,200 versus $225,300); the WCMD/SFW variant costs slightly more ($377,400 versus $366,900) but holds more antiarmor submunitions (40 versus 24); and more WCMD-equipped weapons can be carried on the B-1 bomber (30 versus 12). These facts would appear to make the Air Force variant more cost-effective and operationally efficient than its Navy-developed counterpart and could reduce the number of JSOW variants procured by the Air Force and the Navy together. The Navy, however, is not planning to modify its aircraft to carry the WCMD-equipped weapons.

Multiple Weapon Types Raise Acquisition and Support Expenditures

Officials from the Joint Chiefs of Staff and CINCs told us that having a variety of weapons allows flexibility in countering threats. These officials also acknowledged that the current deep attack capability is adequate to meet the current objectives of defense guidance. However, in terms of acquisition economy and efficiency, questions arise about duplicative development costs, higher than necessary unit production costs, larger

[6]The Air Force configuration uses CEM dispensers already in the inventory, while the Navy weapon features an entirely new weapon dispenser.

than necessary procurement quantities, higher than necessary logistics costs, and reduced interoperability.

First, each of these weapons has a distinct development cost. The total development cost for the weapons in production and development shown in table 4.2 is estimated at $5.2 billion (then-year dollars). If even just two or three development programs had been avoided, the savings could have been substantial. Considered singly, each of these weapons offers incrementally different capabilities, but considered in the aggregate, the services have individually incurred development costs for substantially similar capabilities. For example, each of the four weapons being acquired to attack fixed hard and soft targets is projected (1) to be launched beyond the range of at least mid-range if not long-range enemy air defenses, (2) to have pinpoint accuracy, and (3) to have improved lethality over currently available weapons. Moreover, there is a distinct cost to integrate each weapon into the aircraft[7] that will deliver it to the target area.

Second, the services have bought some weapons in extremely small quantities at high unit costs. For example, the Air Force procured 711 AGM-130s during fiscal years 1990-98 at an average unit cost of $832,000. It had originally planned to buy as many as 600 a year at an average unit cost of under $300,000, but it never bought more than 120 per year. In fiscal year 1998, the Navy plans to buy only 45 SLAM-ERS, fewer than it bought in fiscal year 1997. It also plans to buy an average of about 40 missiles per year until fiscal year 2011 at an average unit cost of about $709,100. The high average production unit cost is due at least in part to the low annual procurement quantities, which in turn are a result of the proliferation of individual systems being procured each year and the relatively fixed defense budget situation described in chapter 2.

Third, associated logistics costs increase if more types of weapons must be supported. For example, providing sufficient quantities of many weapon types to major theaters of war increases the resources that must be used in fuel and lift capacity.

Fourth, overall procurement quantities could be reduced with fewer weapon types because not all of the production quantity is used to support combat requirements. For example, for seven munitions cited in the Deep Attack Weapons Mix Study, an average of about 36 percent of the production units are expected to be used for reserves, training, and

[7]The Tactical Tomahawk is not launched from aircraft.

testing. With fewer types of weapons, quantities for testing and training could be reduced.

Fifth, fewer types of weapons increase interoperability among the services. By using the same weapon, the services have more opportunities for common training, preparation of training, maintenance manuals, and test equipment.

Weapons Mix Study and Quadrennial Defense Review Recommend Little Change in Acquisition Programs

The Deep Attack Weapons Mix Study was a significant undertaking by the Office of the Secretary of Defense and the Joint Staff (with input from the services) to assess the overall mix and affordability of existing and planned weapons. The study based its analysis on wartime scenarios defined by defense guidance and on threat levels and numbers of targets established by DIA. The study used 2006 as a base year and also developed results for conflicts in 1998 and 2014.

The study used two primary computer models: the tactical warfare model, which simulates air and ground combat, and the weapons optimization and resource requirements model, which provides an optimized weapons mix using predetermined budget constraints, weather, range, altitude, and the different phases of the war. (These models are used throughout DOD for a variety of purposes, including the determination of weapons quantity requirements.) The major variables used were weather, air defense threats, target identification, and force levels at the start of a conflict. The selection of weapons was limited to those in the inventory or in production and new ones already in development. The number and type of weapons bought were limited by a $10.5-billion ceiling for purchases from fiscal year 2005 for the baseline case. Cost data were supplied by the services.

The unclassified portions of the study's analysis concluded that the programmed weapon investment budget of about $10.5 billion was sufficient to maintain a qualitative advantage over potential aggressors. It recommended only modest adjustments to current programs and did not recommend the termination of any guided weapon programs.

DOD's Quadrennial Defense Review based its recommendations on the weapons mix study and determined that the current guided weapon programs, with modest adjustments, would provide the capability to defeat potential aggressors in the years ahead. Accordingly, the review recommended no change in procurement plans for the WCMD with CEM and

SFW submunitions, the ATACMS with BAT and BAT improved submunitions, and the Unitary version of the JSOW. The review said DOD would consider decreasing procurement quantities of the Baseline and BLU-108 versions of JSOW, increasing procurement quantities of JASSM and laser-guided bombs, and changing the mix of JDAM variants. Finally, DOD stated that it would continue procuring Hellfire II missiles while the Army analyzed the appropriate mix of Hellfire II and Longbow Hellfire missiles.

We compared the review's recommendations with DOD's most current plans in the fiscal year 1999 budget. We found little change in procurement plans for guided weapons as compared to previous plans. For example, the procurement quantities for the Baseline and BLU-108 variants of JSOW were unchanged, the number of ATACMS Block 1A missiles was reduced from 800 to 652, and no programs were eliminated. Further, DOD later concluded that it would continue as planned with its Longbow Hellfire procurement. While we believe the weapons study (and by extension the defense review) was a step in the right direction in the assessment of DOD-wide requirements for weapons, its impact was, at best, limited.

Independent Reviews Question Relevance of Computer Models Used in Weapons Mix Study

We did not make an independent review of the models used for the Deep Attack Weapons Mix Study, which provided the basis for DOD's strategy for developing and procuring deep attack weapons. According to several observations, however, the weapons study used outdated computer models and assumptions in developing its recommendations.

According to a congressionally directed assessment of the Quadrennial Defense Review by the National Defense Panel, one of the key models used in the weapons mix study was developed for the North Atlantic Treaty Organization-Warsaw Pact scenario and 10 years ago was seen as having significant shortcomings.[8] The Panel also found that the two models used in the study are even less relevant today because of improved weapons technology and changes in warfare. The Panel concluded that the Quadrennial Defense Review sees major theater warfare as a traditional force-on-force challenge (such as that envisioned in Central Europe during the Cold War) and "inhibits the transformation of the American military to fully exploit our advantages as well as the vulnerabilities of potential opponents."

[8]The National Defense Panel: Assessment of the May 1997 Quadrennial Defense Review, May 15, 1997.

The 1997 Defense Science Board Task Force on the Deep Attack Weapons Mix Study[9] and the services' official comments on the weapons mix study also contended that the models were limited in their analysis of potential future conflicts. The Task Force Board stated that the weapons mix study models were very limited in their representation of modern warfare maneuvers. The Board concluded that while the study was conducted with the best available methods, "our confidence in the modeling results must be limited, and our conclusions and acquisition plans must be shaped by military experience and common sense."

The Air Force concluded in its official remarks that the study clearly illustrated the limited ability of DOD's current models to analyze critical components such as suppression of enemy air defenses and the impacts of strategic attack and interdiction; nodal target analysis; logistics; and command, control, communications, computers, intelligence, surveillance, and reconnaissance. The Air Force said that such impacts, "if properly captured in future modeling efforts, may reduce the numbers of weapons required to achieve CINC objectives."

In its official statement, the Navy reported that any computer model output attempting to replicate the dynamic environment of the battlefield must be tempered with military judgment, experience, and common sense. The Navy further stated that the JCS conceptual doctrine of the future should be considered when developing a future weapons mix but that the models were incapable of doing this. Instead, an attrition, force-on-force war in direct opposition to Joint Vision 2010 was modeled.

The National Defense Panel, the Defense Science Board, and the Air Force recommended that new models be developed for future studies and decisions concerning ongoing force structure. DOD is developing a new warfighting model called the Joint Warfare System, but its introduction is several years away. The National Defense Panel said the Joint Warfare System and other potential models are essential for ongoing force structure decisions and recommended that DOD broaden the range of models and accelerate their availability. The Defense Science Board stated that its members know of no existing model that can assess the relative value of multimission weapon systems over a range of conflicts. The Board recommended that DOD develop innovative concepts for rapid evaluation of broad military force structure issues and concluded that the Joint Warfare System may provide the modeling capability to overcome

[9]Report of the Defense Science Board Task Force on Deep Attack Weapons Mix Study (DAWMS), Office of the Under Secretary of Defense for Acquisition and Technology, January 1997.

shortcomings in the current analytical process. The Air Force stated that, if properly developed, future modeling efforts may reduce the number of weapons needed to meet the CINCs' objectives. The Air Force also said that DOD's Joint Warfare System model may address some of these concerns but that, in the end, sound military judgment is the remedy for modeling limitations that may never be resolved.

Coupled with our findings of optimistic funding projections, inflated weapon requirements, duplicative guided weapon programs, and questionable quantities, we believe that DOD does not yet have a sound basis to ensure that it has the proper and cost-effective mix of deep attack weapon programs. While modeling is an important aspect in evaluating alternative mixes of weapons and associated risks, the ultimate decisions on the proper and cost-effective mix of weapons will require sound and disciplined military and business judgment.

Joint Staff Plans Another Weapons Mix/Affordability Study

The JCS Strike Joint Warfighting Capabilities Assessment working group will conduct another deep attack weapons mix/affordability assessment in 1998. This group, according to a JCS official, was not directly involved in the Deep Attack Weapons Mix Study. While plans for this assessment are not complete, it is not expected to re-do the weapons mix study. However, it will consider the weapons mix needed to meet CINC requirements and will also review the weapons requirement determination process. The results of the study will be presented to the JCS.

Oversight of Guided Weapon Requirements and Acquisition Programs Needs Improvement

DOD does not have a central oversight body or mechanism to examine weapon programs in the aggregate and to determine how many weapons it needs or how many it can afford. The task of developing and procuring weapons rests with the services, and DOD examines weapon requirements and capabilities on an individual basis rather than in the aggregate before beginning production. DOD's oversight has not prevented, among other things, duplication of development, service-unique programs, and production schedule stretch-outs. Some DOD officials believe improved oversight is needed, and DOD is considering a proposal to expand the Joint Tactical Air-to-Air Missile Office's responsibilities to include the coordination of air-to-ground weapon requirements and programs.

Oversight of Services' Guided Weapon Capabilities and Programs

DOD is not providing effective management oversight and coordination of the services' guided weapon capabilities and programs to contain development costs, control logistics impacts, maximize warfighting flexibility, and avoid production stretch-outs. This problem is not new. In 1996, in our review of combat air power, we reported that DOD has not been adequately examining its combat air power force structure and its modernization plans from a joint perspective.[1] We found that DOD does not routinely develop information on joint mission needs and aggregate capabilities and therefore has little assurance that decisions to buy, modify, or retire air power systems are sound. We concluded that the Chairman could better advise the Secretary of Defense on programs and budgets if he conducted more comprehensive assessments in key mission areas. We added that broader assessments that tackle the more controversial issues would enable the Chairman to better assist the Secretary of Defense in making the difficult trade-off decisions that will likely be required.

The Commission on Roles and Missions of the Armed Forces reported that it is not clear that DOD has the correct balance of deep attack weapons and stated that "currently, no one in DOD has specific responsibility for specifying the overall number and mix of deep attack systems." The report concluded that this situation illustrates the lack of a comprehensive process to review capabilities and requirements in the aggregate. Current institutional practices "allow the Services to develop and field new weapons without a rigorous, DOD-wide assessment of the need for these weapons and how they will be integrated with the other elements planned for our arsenal."

[1]Combat Air Power: Joint Mission Assessments Needed Before Making Program and Budget Decisions (GAO/NSIAD-96-177, Sept. 20, 1996).

The individual services have always been the primary players in the acquisition process and have been given broad responsibilities to organize, train, and equip their forces under title 10 of the U.S. Code. Officials in both the Office of the Joint Chiefs of Staff and the Office of the Secretary of Defense view their own role in determining weapon requirements and acquisition programs only as advisory. Neither office has taken responsibility for critically assessing the overall capability of the guided weapons in development, production, and inventory or for determining the long-term cost-effectiveness of the services' guided weapon acquisition plans.

To achieve a stronger joint orientation within DOD, Congress enacted the Goldwater-Nichols Department of Defense Reorganization Act of 1986. This act gave the Chairman of the Joint Chiefs of Staff and the CINCs of the combatant commands stronger roles in DOD matters, including the acquisition process. As principal military adviser to the Secretary of Defense, the Chairman is now expected to assess military requirements for defense acquisition programs from a joint warfighting military perspective and to advise the Secretary on the priority of requirements identified by the CINCs and the extent to which program recommendations and budget proposals of the military departments conform to these priorities. The Chairman is also expected to submit to the Secretary alternative program recommendations and budget proposals to achieve greater conformance with CINC priorities. Subsequent legislation has given the Chairman additional responsibilities to examine ways DOD can eliminate or reduce duplicative capabilities.[2]

Within the Joint Chiefs of Staff, the J8 Directorate tracks the progress of weapon acquisition programs, assesses the current capabilities available to CINCs, and advises the services of apparent deficiencies. In addition, a second group associated with JCS—the Joint Requirements Oversight Council (JROC)[3]—has the authority to advise the Chairman of the Joint Chiefs of Staff and the Secretary of Defense on CINC requirement priorities, assess military requirements for defense acquisition programs,[4] submit alternative program and budget recommendations, and prepare net assessments of capabilities. JROC validates the mission need statement required for initiating major acquisition programs as well as the key

[2]National Defense Authorization Act for Fiscal Year 1993 (P.L. 102-484, sec. 901).

[3]JROC is a cross-service, decisional council chaired by the Vice Chairman, JCS. Members include the Vice Chiefs of the Army, the Navy, the Air Force, and the Marine Corps.

[4]JROC is required to review the requirement for any program designated as a major acquisition program and can choose to review the requirement for other programs.

operational performance parameters for the proposed weapon. Finally, the Chairman of the Joint Chiefs of Staff evaluates the extent to which the services' proposed guided weapon budgets conform to the priorities established in DOD's strategic plans (such as the Quadrennial Defense Review) and to CINCs' requirements and makes recommendations to the Secretary of Defense.

The Defense Acquisition Board, chaired by the Under Secretary of Defense for Acquisition and Technology, is the senior advisory group within DOD chartered to oversee the defense acquisition process. The Board's mission is to help define and validate new system requirements, examine trade-offs between cost and performance, explore alternatives to new research and development, and recommend full-scale development and full-rate production. The Board has broad review responsibility for decision milestones during critical acquisition phases. In addition to reviewing the mission need statements and operational requirements documents in the initial phases of development, the Board also reviews the detailed analyses of alternative solutions prepared by the services. These analyses provide the rationale for one alternative over another and should include a comparison of current and upgraded weapons with new proposed weapons.

In 1996, Congress, in addition to asking DOD to conduct its Deep Attack Weapons Mix Study, requested a report on how DOD approves development of new guided weapons and avoids duplication and redundancy in guided weapon programs.[5] It also sought information on the feasibility of carrying out joint development and procurement of guided weapons. In response, the Secretary of Defense issued a report to Congress in April 1996 on the process for approving and initiating development programs.[6] The report noted that through reviews by JROC and the Defense Acquisition Board, several major guided weapon acquisition programs had been designated as joint programs. DOD concluded that redundancies and duplication in the services' weapon acquisitions had been minimized as a result of reviews by the Office of the Secretary of Defense and the Joint Chiefs of Staff.

To the contrary, DOD's oversight approach to the services' weapon acquisition and procurement has had very limited effect on guided weapon programs. DOD's oversight has not prevented inflated funding projections for guided weapons, as discussed in chapter 2; inflated requirements for guided weapons, as discussed in chapter 3; and instances of service-unique

[5]P.L. 104-106, sec. 261.

[6]Precision Guided Munitions Acquisitions Process Report, April 1996.

weapons, overlap and duplication, production inefficiencies, increased logistics burdens, and reduced interoperability, as discussed in chapter 4. For example, JROC and the Defense Acquisition Board have approved the acquisition of several guided weapon programs with very similar capabilities—JASSM, SLAM-ER, the Tactical Tomahawk, and the Unitary version of the JSOW—without adequate consideration of available aggregate capabilities or aggregate requirements for such weapons.

Limited Recognition of the Need to Improve Oversight and Coordination

Some DOD officials have recognized a need for increased oversight of guided weapon programs. According to these officials, the Department established an office to oversee acquisition of air-to-ground weapons within the Air Force Office of Requirements and within the Navy's Aviation Requirements Branch. However, these oversight responsibilities are adjunct to the regular duties of these offices, and no meetings have taken place in over 4 years.

DOD has had more success in providing oversight of air-to-air missile programs. In fiscal year 1989, in response to congressional concerns, the Joint Tactical Air-to-Air Missile Office was established to eliminate duplication in air-to-air missile programs. The Office has representatives from the Navy and the Air Force requirements branches, and its operations are guided by a memorandum of agreement and a charter. Representatives are assigned to the Office rather than fulfilling their duties as adjunct responsibilities. In recent years, the Office was successful in avoiding duplication in the services' air-to-air missile programs by ensuring the continued joint development and procurement of the Advanced Medium Range Air-to-Air Missile and the Air Intercept Missile-9X by the Navy and the Air Force.

Currently, no joint coordinating office exists for the requirements and acquisition of deep attack weapons. A proposal is circulating within the Air Force and the Navy to expand the responsibilities of the current Joint Tactical Air-to-Air Missile Office to include the coordination of air-to-ground weapons. Although the scope of such an office would have to be expanded significantly to address all guided weapons, the success of the Air-to-Air Missile Office has shown that the Air Force and the Navy can effectively coordinate their requirements and establish joint programs for the acquisition of similar weapons. Expanding the Office's purview to include guided weapons would, in our view, provide some assurance that decisions in the deep attack area have been assessed from the perspective of the services' combined requirements, capabilities, and acquisition plans.

Conclusions and Recommendations

Conclusions

DOD's current investment strategy for guided weapons may not be executable as proposed because it is contingent on sizable increases in procurement funding within a relatively fixed defense budget. As major commitments are made to the initial procurement of the planned guided weapon programs over the next several years, a significant imbalance is likely to result between funding requirements and available funds. As a result of understated cost estimates and overly optimistic funding assumptions, more programs have been approved than can be supported by available funds. Such imbalances have historically led to program stretch-outs, reduced annual procurement rates, higher unit costs, and delayed deliveries to operational units. Every effort needs to be made to avoid these "pay more for less" outcomes. Further, these imbalances may be long-term and may restrict DOD's flexibility to respond to unexpected requirements or to procure potentially innovative systems.

The current inventory of deep attack weapons (guided and unguided) is both large and capable, and DOD is improving some weapons to make them even more effective. Although the existing inventory is considered sufficient to support the current objectives of defense guidance, DOD's plans for individual weapons will, in the aggregate, almost double the size of the guided weapon inventory at a time when worldwide threats are stable or declining. DOD expects the new, more modern weapons to enable warfighters to accomplish the same objectives with fewer weapons and casualties and less unintended collateral damage.

DOD needs to establish an aggregate requirement for deep attack capabilities and assess the incremental contribution of its guided weapon acquisitions. Without such a requirement and analyses, it is difficult to understand DOD's rationale as to why, in the aggregate, it needs to almost double the size of its guided weapon inventory, particularly in today's budgetary and security environment. Further, the services' requirement processes are focused on individual systems and appear to inflate the quantity of each system needed. For example, the services use conservative assumptions concerning threats and target lists, appropriate weapon choices, the use of advanced tactics, and strategic reserves. The use of more realistic assumptions would lead to lower weapon requirements.

The services have had numerous opportunities to develop and procure guided weapons in a more cost-effective and economical manner. However, when reviewing the services' currently planned programs in the aggregate, we found (1) widespread overlap and duplication of guided

weapon types and capabilities, (2) questionable quantities being procured for each target class, and (3) a preference for longer standoff and more accurate weapons rather than for options that may be as effective and less costly.

DOD's Deep Attack Weapons Mix Study was an opportunity for DOD to critically assess its weapons procurement programs and provide a basis for restructuring them. However, despite the significant effort that went into the study, it still does not, in our view, give DOD the assurance that it has the proper and cost-effective mix of deep attack weapon programs. Therefore, DOD cannot be confident that force structure and modernization decisions will result in the most cost-effective mix of forces to fulfill the national military strategy.

Because DOD does not routinely develop information on joint mission needs and aggregate capabilities, it has little assurance that decisions to buy, modify, or retire deep attack weapons are sound. Broader assessments that tackle the more controversial deep attack issues would enable the Secretary of Defense to make the difficult trade-off decisions that will likely be required. Broadening the current joint warfare capabilities assessment processes would be a good starting point. Alternatively, the establishment of a DOD-wide coordinating office for requirements and possible joint programs for the acquisition of deep attack weapons, modeled after the Joint Tactical Air-to-Air Office, would provide some assurance that decisions in the deep attack area have been assessed from the perspective of the services' combined requirements, capabilities, and acquisition plans.

Recommendations

DOD's planned spending for guided weapons will escalate rapidly over the next few years, and key decisions will be made to start procurement of some very costly and possibly unneeded guided weapons. Instead of continuing to start procurement programs that may not be executable as proposed, DOD should determine how much procurement funding can realistically be expected to be available for guided weapons over the long term and cost-effectively execute those programs within that level of funding. In doing so, DOD should also consider the already large inventory of guided weapons and the advances in technologies that are expected to increase the effectiveness of future weapons as well as the current and projected decline in threat.

Therefore, we recommend that the Secretary of Defense, in conjunction with the Chairman of the Joint Chiefs of Staff and the Secretaries of the Army, the Navy, and the Air Force,

- establish an aggregate requirement for deep attack capabilities;
- reevaluate the assumptions used in guided weapon requirements determination processes to better reflect the new international situation, realistic target sets, enhanced weapon effectiveness, proper weapon selection, and the use of advanced tactics; and
- reevaluate the planned guided weapon acquisition programs in light of existing capabilities and the current budgetary and security environment to determine whether the procurement of all planned guided weapon types and quantities (1) is necessary and cost-effective in the aggregate and (2) can clearly be carried out as proposed within realistic, long-term projections of procurement funding.

Further, we recommend, as we did in 1996 in our combat air power reports, that the Secretary of Defense, with the Chairman of the Joint Chiefs of Staff, develop an assessment process that yields more comprehensive information on procurement requirements and aggregate capabilities in key mission areas such as deep attack. This can be done by broadening the current joint warfare capabilities assessment process or developing an alternative mechanism. One such alternative could be the establishment of a DOD-wide coordinating office to consider the services' combined requirements, capabilities, and acquisition plans for deep attack weapons. This office could be modeled after the Joint Tactical Air-to-Air Missile Office.

DOD Comments and Our Evaluation

In written comments on a draft of this report, DOD partially concurred with our recommendations, stating that the Joint Staff will be conducting a follow-up to the Deep Attack Weapons Mix Study and that a coordinating office will be established to assess joint weapon requirements. However, DOD stated that our report takes a snapshot of today's inventory and ignores how and why DOD got there and how it is profiting from that experience. DOD said our report fails to recognize its significant efforts to improve its requirements, acquisition, and oversight processes.

A follow-on study to the Deep Attack Weapons Mix Study is a good step but we urge DOD to conclude the study with decisions on which programs to cut back and which to end in order to ensure that its programs are fully executable within expected budgets. Also, as a partial solution to the need

for more comprehensive assessments, we see DOD's agreement to establish a body to review and deconflict joint air-to-surface requirements as important. We agree with DOD that such a body might better resolve issues among the services with less DOD intervention. We urge DOD to pursue the establishment of such a body and believe it should address all deep attack requirements, not just air-to-surface requirements.

This report focuses on DOD's plans to acquire additional guided weapons for deep attack missions within the context of the existing inventory of deep attack weapons. DOD has a variety of acquisition reform initiatives underway that may have an impact on the structure and management of individual acquisition programs. However, these initiatives have little bearing on the determination of DOD-wide requirements for deep attack weapons or on how to procure those requirements in the most cost-effective manner possible.

We have also considered DOD's efforts to improve its processes. In the recent past, we have examined in considerable depth DOD's requirements, acquisitions, and oversight processes.[1] While we acknowledge DOD's efforts and progress to date in improving those processes, the problems reported here of optimistic funding projections, inflated requirements, overlapping and duplicative programs, and service-unique programs continue. We urge DOD to continue its acquisition reforms and other initiatives but also to reexamine the oversight process to determine ways to provide more discipline in its processes and to fund fewer programs.

Although DOD's official comments do not address the mismatch between commitments and resources, DOD officials stated at the exit meeting on this report that, due to the mismatch between commitments and resources, DOD plans to reduce fiscal year 2000 procurement quantities for several guided weapon programs. Reductions in annual procurement quantities and stretch-outs in procurement schedules should not be the inevitable solutions to the mismatch between its commitments to programs and expected resources. Every effort should be made to avoid these "pay more for less" outcomes.

[1]High Risk Series (GAO/HR-97-6, Feb. 1997) and Combat Air Power (GAO/NSIAD-96-177, Sept. 20, 1996).

Comments From the Department of Defense

OFFICE OF THE UNDER SECRETARY OF DEFENSE

3000 DEFENSE PENTAGON
WASHINGTON DC 20301-3000

ACQUISITION AND TECHNOLOGY

16 SEP 1998

Mr. Louis J. Rodrigues
Director, Defense Acquisition Issues
National Security and International
Affairs Division
U. S. General Accounting Office
Washington, DC 20548

Dear Mr. Rodrigues:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report titled "Weapons Acquisition: Guided Weapon Plans Need To Be Reassessed," dated August 12, 1998 (GAO Code 707274/OSD Case 1671-X). The report fails to recognize the significant progress made in evaluating our deep attack weapon needs. It takes a snapshot of today's inventory and ignores how, and why, we got there and how the Department of Defense is profiting from that experience in weapons planning and acquisition. The draft report concentrates on the cumulative inventory bought using old rules, rather than today's sound direction in acquiring more effective, more flexible weapons with an intensified cost-conscious approach through acquisition reform. The report does not adequately describe the process by which the Department establishes requirements, allocates targets to the Services, determines the affordability, and chooses the quantity of weapons needed.

See comment 1.

We have increased our emphasis on looking at the weapon mix problem from a joint perspective. Examples include the Deep Attack Weapons Mix Study (DAWMS) and the Capabilities-Based Munitions Requirements (CBMR) process. DAWMS was the first study to trade munitions among all the Services in the context of a full campaign, and produced insights which broadened the weapons debate. We recognize that this initial look had limitations, and we are striving to overcome them.

See comment 2.

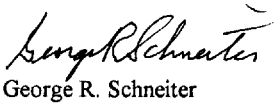
Affordability is a key tenet of our programs. Examples include the low production cost demonstrated by the Joint Direct Attack Munition program, the Joint Stand-Off Weapon cost metric, and recent "Cost As an Independent Variable" activities. Our new Joint Air-to-Surface Standoff Missile program has a cost Key Performance Parameter, making cost a real requirement for that program. The report gives little credit for our move to joint programs and suggests a preference for non-joint programs by an inappropriate comparison of numbers. The Department's position is clearly to support joint programs. Exceptions must be supported by strong affordability issues or outstanding Service unique requirements.

See comment 3.

See comment 4.

Pentagon oversight is adequate. To suggest otherwise ignores the roles of the Joint Staff and the Joint Requirements Oversight Council; the Milestone 0 review, where an Analysis of Alternatives and Mission Need Statement are required to begin any new program; the Department's role in assessing programs at each milestone; the CBMR process to define munitions requirements; and finally, the role of the Planning, Programming, and Budgeting System, in particular the Program Review, to show how the Department oversees Service programming. We are taking your recommendations to further improve our ongoing processes. Enclosed are our more-detailed comments on your recommendations and the draft report. A security review and a detailed list of comments and corrections have been provided under separate cover. The Department appreciates the opportunity to comment on the draft report.

Sincerely,



George R. Schneiter
Director
Strategic and Tactical Systems

Enclosures

GAO DRAFT REPORT - DATED AUGUST 12, 1998
(GAO CODE 707274) OSD CASE 1671-X

"WEAPONS ACQUISITION: GUIDED WEAPON PLANS NEED TO BE REASSESSED"

DOD COMMENTS TO THE GAO RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense, in conjunction with the Chairman of the Joint Chiefs of Staff and the Secretaries of the Army, Navy, and Air Force:

- establish an aggregate requirement for deep attack capabilities;
- reevaluate the assumptions used in their guided weapon requirements determination processes to better reflect the new international situation, realistic target sets, enhanced weapon effectiveness, proper weapon selection, and the use of advanced tactics; and
- reevaluate the planned deep attack weapon acquisition programs (in light of existing capabilities and the current budgetary and security environment) to determine if the procurement of all planned guided weapon types and quantities (1) is necessary and cost-effective in the aggregate and (2) can be clearly executable as proposed within realistic, long-term projections of procurement funding.

DOD RESPONSE: Partially Concur

The Department has made significant progress over the last few years in evaluating our deep attack weapon needs. In particular, we are involving the CINCs more and have increased our emphasis on looking at the weapon mix problem from a joint perspective. Examples include the Deep Attack Weapons Mix Study (DAWMS) and the Capabilities-Based Munitions Requirements (CBMR) process. DAWMS was the first study to trade munitions among all the Services in the context of a full campaign. It was a collaborative analysis that used the best tools available at that time (one of which was a relatively new optimization model – the Weapons Optimization and Resource Requirements Model (WORRM)). The study produced several insights, which broadened the weapons debate and impacted several programs in significant ways. We recognize that this initial look had limitations and we are striving to overcome them.

See comment 5.

Although we constantly strive to improve our processes, we believe they do currently capture the new international situation, realistic target sets, enhanced weapon effectiveness, proper weapon selection, and the use of advanced tactics as best we know them. These processes, by which the Department establishes requirements, allocate

See comment 6.

targets to the Services, determine the affordability, and choose the quantity of weapons needed. The effectiveness of these processes will continue to grow.

See comment 2.

With regard to affordability, there has been a lull in munitions procurement. This is partially due to the cancellation of the expensive Tri-Service Standoff Attack Missile program and the upcoming maturation of the primary three Joint programs - JDAM, JSOW, and JASSM. Now that we are ready to buy what has been in development - the next generation of weapons - our weapons procurement may increase over that expended in recent years. Affordability is a key tenet of our programs. Examples include the low production costs of the JDAM program, the JSOW Baseline cost metric, and the recent JSOW Unitary Cost as an Independent Variable (CAIV) activities. Our new JASSM program includes cost among the Key Performance Parameters, making CAIV a real requirement for that program. We believe our acquisition programs are necessary and cost-effective, and can be executed within budget limitations.

See comment 7.

See comment 4.

Pentagon oversight is adequate. To suggest otherwise ignores the role of the Joint Staff and the Joint Requirements Oversight Council; the Milestone 0 review, where an Analysis of Alternatives and a Mission Need Statement are required to begin any new program; OSD's role in assessing programs at each milestone; the CBMR process to define munitions requirements; and finally, the role of the Planning, Programming, and Budgeting System, in particular the Program Review to show how the Department oversees Service programming.

RECOMMENDATION 2: The GAO also reasserts its 1996 recommendation included in its combat air power reports that the Secretary of Defense, along with the Chairman of the Joint Chiefs of Staff, should develop an assessment process that yields more comprehensive information on procurement requirements and aggregate capabilities in key mission areas such as deep attack. The GAO pointed out that this can be done by broadening the current Joint Warfare Capabilities Assessment process or developing an alternative mechanism. The GAO suggested that one alternative would be the establishment of a DoD-wide coordinating office, modeled after the Joint Tactical Air-to-Air Missile Office, to consider the Services' combined requirements, capabilities, and acquisition plans for guided weapons.

DOD RESPONSE: Partially Concur

See comment 8.

The Department continues to improve our processes. We are currently looking at expanding the role of the Joint Tactical Air-to-Air Missile Office to look also at the Joint Air-to-Surface needs. This organization is a Service led effort to help deconflict program requirements and programs. Although it would be unreasonable to expect this group to take on the larger issues that you describe in the report, we do believe that such a body might better resolve issues among the Services with less OSD intervention.

The following are GAO's comments on the Department of Defense's (DOD) letter dated September 16, 1998.

GAO Comments

1. As we point out in the report, the Deep Attack Weapons Mix Study is not, in itself, a solution but a tool to help defense decisionmakers make the difficult but necessary decisions in the current budgetary and security environment. Nevertheless, the Weapons Mix Study was important in that it attempted to address the DOD-wide requirement for deep attack weapons; we urge DOD to continue and improve on the process.

2. We recognize that DOD has a number of initiatives underway to control the cost of ongoing programs. However, as our report points out, DOD needs to fully address the affordability of programs before they are approved. Even if DOD were to address the cost of each program, there are too many guided weapon procurement programs to be effectively supported with the limited amount of available procurement funding. This problem results in DOD stretching out its procurement programs and consequently increasing unit costs. We believe that this is an outcome DOD should work to avoid.

3. We believe that DOD could do much better in terms of following its policy on joint guided weapon programs. For example, the Joint Air-to-Surface Standoff Missile (JASSM) and the unitary variant of the Joint Standoff Weapon (JSOW) are joint in name only.

4. In the report, we have addressed the roles and responsibilities of those involved in oversight of requirements for and acquisition of guided weapons. As we stated in the report, the oversight processes need to be improved. The Office of the Secretary of Defense and the Joint Chiefs need to use not only military judgment but exercise sound business practices in their evaluation of the services' guided weapon plans.

5. We also believe that the weapons mix study process should continue and be improved. However, the process should rely on models for information, not answers, or as a substitute for sound military judgment and business practices.

6. We recognize that much effort has been exerted to improve the services' requirements processes. However, we believe that much more needs to be done. The current processes and models permit the use of conservative assumptions that unnecessarily inflate requirements.

7. DOD does not explain in its written comments how it believes it can execute its guided weapon acquisition programs as planned within budget limitations. However, at the exit conference for this report, DOD officials told us that they fully expect to reduce annual procurement quantities and stretch-out procurement schedules, thereby accepting higher unit costs.

8. We believe DOD's agreement to establish a body to review and deconflict joint air-to-surface requirements is a partial solution to the need for more comprehensive assessments. As DOD states, a body such as this might better resolve issues among the services with less DOD intervention. While we urge DOD to pursue the establishment of such a body, we believe it should address all deep attack requirements, not just air-to-surface requirements.

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