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1994 DEFENSE BUDGET

Potential Reductions, Rescissions, and Restrictions to RDT&E Programs



150025



National Security and
International Affairs Division

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Congressional Committees

We examined the Department of Defense's (DOD) fiscal year 1994 budget request and prior years' appropriations for selected research, development, test, and evaluation (RDT&E) programs. Our objectives were to identify potential reductions to the fiscal year 1994 budget request and potential rescissions to prior year appropriations. We also identified potential restrictions the Congress can place on the obligational authority for certain RDT&E programs. This report summarizes information and briefings provided to your staffs from May to September 1993. This is one of a series of reports that examines defense budget issues.

Our review showed that schedule delays, program requirements changes, and uncertainties have affected RDT&E funding requirements for fiscal year 1994 as well as prior years' appropriations. As shown in table 1, we identified potential budget reductions of about \$472.6 million and rescissions from prior years' appropriations of about \$42.7 million. We also identified approximately \$958.3 million in requested funding that the Congress can restrict.

Table 1: Potential Reductions, Rescissions, and Restrictions to RDT&E Programs

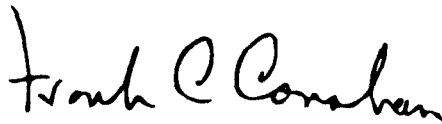
Dollars in millions			
Agency	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions
Army (app. I)	\$14.1	\$16.8	\$21.9
Navy (app. II)	8.4	18.5	•
Air Force (app. III)	415.3	7.4	142.4
Multiservice (app. IV)	34.8	•	27.2
Defensewide (app.V)	•	•	766.8
Total	\$472.6	\$42.7	\$958.3

We focused on program cost, schedule, and performance issues and examined expenditure documents to determine whether requests were adequately justified and whether unobligated funds from prior appropriations should be retained. We also evaluated budgetary implications of program changes resulting from threat changes DOD identified. Appendix VI provides information regarding our scope and methodology.

We did not obtain written agency comments on a draft of this report. However, we did discuss the details in this report with Office of the Secretary of Defense and program officials and incorporated their comments where appropriate.

We are sending copies of this report to the Secretaries of Defense, the Army, the Navy, and the Air Force; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

This report was prepared under the direction of Louis J. Rodrigues, Director, Systems Development and Production Issues, who may be reached on (202) 512-4841 if you or your staffs have any questions. Other major contributors are listed in appendix VII.



Frank C. Conahan
Assistant Comptroller General

List of Congressional Committees

The Honorable Sam Nunn
Chairman
The Honorable Strom Thurmond
Ranking Minority Member
Committee on Armed Services
United States Senate

The Honorable Daniel K. Inouye
Chairman
The Honorable Ted Stevens
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Committee on Appropriations
United States Senate

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Committee on Armed Services
House of Representatives

The Honorable John P. Murtha
Chairman
The Honorable Joseph M. McDade
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Subcommittee on Defense
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Contents

Letter		1
Appendix I		8
Potential Reductions, Rescissions, and Restrictions to Army Research, Development, Test, and Evaluation Programs	Environmental Quality Technology	8
	Line-of-Sight, Antitank	9
	Tri-Service Standoff Attack Missile	10
	Javelin	11
	Brilliant Antiarmor Submunition	12
	Aviation-Advanced Development	14
	Other Missile Product Improvement Programs	14
Appendix II		17
Potential Reductions and Rescissions in Navy RDT&E Programs	Generic Logistics Research and Development Technology Demonstrations	17
	Advanced Anti-Submarine Warfare Technology	18
	Satellite Laser Communications	18
	Electronic Warfare Development	19
Appendix III		21
Potential Reductions, Rescissions, and Restrictions to Air Force RDT&E Programs	National Aero-Space Plane Technology Program	21
	Advanced Cruise Missile Program	23
	Defense Support Program-Ground Station Upgrade	24
	Specialized Undergraduate Pilot Training	24
	F-22 Advanced Tactical Fighter	26
	Night/Precision Attack	27
	F-16 Squadrons	28
	Spacelifter	29
Appendix IV		31
Potential Reductions and Restrictions to Multiservice RDT&E Programs	Advanced Tactical Air Reconnaissance System	31

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<p>Appendix V Potential Restrictions to Defensewide RDT&E Programs</p>	<p>Theater Missile Defenses Theater Missile Defenses (Engineering and Manufacturing Development)</p>	<p>33 33 35</p>
<hr/>		
<p>Appendix VI Scope and Methodology</p>		<p>37</p>
<hr/>		
<p>Appendix VII Major Contributors to This Report</p>		<p>38</p>
<hr/>		
<p>Tables</p>	<p>Table 1: Potential Reductions, Rescissions, and Restrictions to RDT&E Programs Table I.1: Summary of Potential Reductions, Rescissions, and Restrictions to Army Programs Table I.2: Environmental Quality Technology Funding/Request and Potential Rescission Table I.3: Line-of-Sight, Antitank Funding and Potential Rescission Table I.4: Tri-Service Standoff Attack Missile Request and Potential Reduction Table I.5: Javelin Funding/Request and Potential Reduction Table I.6: Brilliant Antiarmor Submunition Funding/Request and Potential Reduction and Restriction Table I.7: Aviation-Advanced Development Funding/Request and Potential Rescission Table I.8: Other Missile Product Improvement Programs Funding/Request and Potential Restriction Table II.1: Summary of Potential Reductions and Rescissions in Navy Programs Table II.2: Generic Logistics Research and Development Technology Demonstrations Funding/Request and Potential Rescission Table II.3: Advanced Anti-Submarine Warfare Technology Funding/Request and Potential Rescission</p>	<p>1 8 9 9 11 12 14 14 16 17 17 18</p>

Table II.4: Satellite Laser Communications Funding and Potential Rescission	19
Table II.5: Electronic Warfare Development Funding/Request and Potential Reduction	20
Table III.1: Summary of Potential Reductions, Rescissions, and Restrictions to Air Force Programs	21
Table III.2: National Aero-Space Plane Technology Program Funding/Request and Potential Restriction	23
Table III.3: Advanced Cruise Missile Funding/Request and Potential Rescission	23
Table III.4: Defense Support Program-Ground Station Upgrade Funding/Request and Potential Rescission	24
Table III.5: Specialized Undergraduate Pilot Training Funding/Request and Potential Reduction	26
Table III.6: F-22 Advanced Tactical Fighter Funding/Request and Potential Reduction	27
Table III.7: Night/Precision Attack Funding/Request and Potential Reduction and Restriction	28
Table III.8: F-16 Squadrons Funding/Request and Potential Reduction and Restriction	29
Table III.9: Spacelifter Funding/Request and Potential Restriction	30
Table IV.1: Summary of Potential Reductions and Restrictions to Multiservice Programs	31
Table IV.2: Advanced Tactical Air Reconnaissance System Funding/Request and Potential Reduction and Restriction	32
Table V.1: Summary of Potential Restrictions to Defensewide Programs	33
Table V.2: Theater Missile Defenses Funding/Request and Potential Restriction	35
Table V.3: Theater Missile Defenses Funding/Request and Potential Restriction	36

Abbreviations

BMDO	Ballistic Missile Defense Organization
DOD	Department of Defense
NASA	National Aeronautics and Space Administration
PAC-3	Patriot Advanced Capability-Three
RDT&E	research, development, test, and evaluation

Potential Reductions, Rescissions, and Restrictions to Army Research, Development, Test, and Evaluation Programs

We identified about \$14.1 million in potential reductions in the Army's fiscal year 1994 research, development, test, and evaluation (RDT&E) request, \$16.8 million in potential rescissions in the Army's fiscal years 1992 and 1993 funding, and \$21.9 million in potential restrictions to the Army's obligational authority for fiscal year 1994 requests. The following section provides a brief description of our analysis and proposed actions by program. The proposed actions are summarized in table I.1.

Table I.1: Summary of Potential Reductions, Rescissions, and Restrictions to Army Programs

Dollars in millions

Program	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions	See page
Environmental Quality Technology	•	\$10.400	•	8
Line-of-Sight, Antitank	•	4.000	•	9
Tri-Service Standoff Attack Missile	\$4.933	•	•	10
Javelin	2.200	•	•	11
Brilliant Antiarmor Submunition	7.000	•	\$5.000	12
Aviation-Advanced Development	•	2.400	•	14
Other Missile Product Improvement Programs	•	•	16.900	14
Total	\$14.133	\$16.800	\$21.900	

Environmental Quality Technology

For fiscal year 1993, the Congress provided about \$62.9 million to the Army for the Environmental Quality Technology program. Included in the amount was \$14.6 million for Biodegradable Packaging Technology. This program is a joint Department of Defense (DOD), Department of Agriculture, and industry effort to commercialize biodegradable packaging.

Results of Analysis

The Congress can rescind \$10.4 million of the Army's fiscal year 1993 unobligated funds for the Environmental Quality Technology program because the Army has not released these funds to the responsible program office and has not established a requirement for the funds. An Army official said that these funds are being held for other future requirements.

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

**Table I.2: Environmental Quality
Technology Funding/Request and
Potential Rescission**

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
23	\$29.487	\$62.875	\$21.229
Potential rescission	•	10.400	•

Line-of-Sight, Antitank

The Line-of-Sight, Antitank weapon system is a kinetic-energy, direct-fire missile that is mounted on a Bradley Fighting Vehicle chassis. The missile uses high speed and a heavy metal rod, rather than an explosive warhead, to destroy tanks. The missile is intended to replace the Improved Tube-Launched, Optically Tracked, Wire-Guided missile, which is mounted on a M113 vehicle chassis.

Results of Analysis

The Army did not request funds for the weapon system in fiscal year 1994. However, \$4 million can be rescinded from the fiscal year 1993 unobligated funding because the Office of the Secretary of Defense does not plan to permit the \$4 million to be expended for the weapon system.

The Army had planned to begin Line-of-Sight, Antitank engineering and manufacturing development in fiscal year 1993. However, the Office of the Secretary of Defense required the weapon system to continue in advanced technology development and withheld \$47 million of the fiscal year 1993 appropriation—\$43 million to fund the program in fiscal year 1994 and \$4 million to be reprogrammed to other uses.

The deputy program manager stated he expects the \$43 million to be released in fiscal year 1994, and he acknowledged that the \$4 million was withdrawn and would not be released. Therefore, the \$4 million is excess to the program's needs and is available for rescission.

**Table I.3: Line-of-Sight, Antitank
Funding and Potential Rescission**

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
56	\$27.900	\$113.150	•
Potential rescission	•	4.000	•

Tri-Service Standoff Attack Missile

The Tri-Service Standoff Attack Missile is a joint Army, Air Force, and Navy program (led by the Air Force) to develop a stealthy conventional cruise missile. This Army missile variant is expected to carry 22 Brilliant Antiarmor Submunitions and be launched from the Multiple Launch Rocket System launcher.

Results of Analysis

The Army's fiscal year 1994 budget request of approximately \$89.7 million for the Tri-Service Standoff Attack Missile can be reduced by about \$4.9 million because the request exceeds requirements. The obligation plans for fiscal year 1994 show a planned expenditure of \$84.8 million, or \$4.9 million less than the request.

According to program management officials, the Army included \$4.9 million in the overall request in anticipation of congressional reductions and withholding of funding at higher command levels. The anticipated withholding included a general reduction by the program executive office and funds for small business innovative research and settling closed accounts.

Program management officials told us that the \$4.9 million was not excess to their needs because unforecasted expenses arise. They said, for example, that the Army is renegotiating the contract that provides Brilliant Antiarmor Submunitions for the Tri-Service Standoff Attack Missile's operational tests and that the Tri-Service Standoff Attack Missile program has to pay for these test articles. They also said that the \$1.3 million for small business innovative research would not be released to the project office.

However, in the example of the contract renegotiation, we found that the Army has not determined the amount of the increase nor the fiscal year that the adjustments will occur. Furthermore, cost estimates used for preparing budget submissions already include amounts for risk, and other administrative remedies are available for meeting unexpected funding needs.

We agree that the project office does not receive the amounts that are withheld for small business innovative research. However, the authorizing legislation tasked the Army, not the project office, to provide funding for small business innovative research.

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

**Table I.4: Tri-Service Standoff Attack
Missile Request and Potential
Reduction**

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
103	• ^a	•	\$89.682
Potential reduction	•	•	4.933

^aAmounts appropriated for the Tri-Service Standoff Attack Missile for fiscal years 1992 and 1993 are classified.

Javelin

The Javelin is designed to be a medium-range, portable antiarmor system for use in rapid deployment operations, rough terrain, and air assault operations. It is intended to defeat tanks and other targets expected on the battlefield and to replace the Dragon weapon system in the Army and Marine Corps inventories. The system will consist of a missile; an expendable container and launch tube, which will house the missile; and a reusable command and launch unit for target acquisition and surveillance.

Results of Analysis

The Army's fiscal year 1994 request of about \$44.9 million for the Javelin can be reduced by \$2.2 million because the request exceeds requirements by \$2.2 million.

The Javelin project manager agreed; however, he said that 5 percent was added in anticipation of congressional reductions and appropriation adjustments by the Army and the program executive office. He said the general congressional reductions and Army adjustments in fiscal year 1993 amounted to 5.4 percent for such items as small business innovative research and closed accounts. The project manager said, although not a requirement, the \$2.2 million will be needed if similar reductions occur in fiscal year 1994. The project manager also stated that the amount that is withheld for small business innovative research is not released to the project office.

The request can be reduced by \$2.2 million because (1) the amount is not planned to meet program requirements; (2) general reductions do not occur every year; (3) amounts withheld for closed accounts are contingency funds rather than actual needs; and (4) the Army, not the individual projects, is tasked for small business innovative research.

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

**Table I.5: Javelin Funding/Request and
Potential Reduction**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
109	\$118.297	\$95.929	\$44.937
Potential reduction	•	•	2.200

**Brilliant Antiarmor
Submunition**

The Brilliant Antiarmor Submunition is designed to be an antiarmor, top attack submunition that will use an acoustic sensor to initially locate targets and an infrared seeker to guide the submunition to its target. The submunition's primary carrier will be the Army variant of the Tri-Service Standoff Attack Missile that will be launched from the Multiple Launch Rocket System launcher. The carrier will deliver the submunition behind enemy lines to attack tanks and other targets before they can reinforce front line troops.

The Army was planning to begin a product improvement program for the submunition in fiscal year 1993. The goal of the product improvement program is to increase submunition lethality and allow attack of new targets, including cold, stationary tanks and mobile missile launchers. The carrier for the improved version will be a longer range version of the Army Tactical Missile System.

Results of Analysis

The Army's fiscal year 1994 request of about \$117 million for the submunition can be reduced by \$7 million because the request exceeds requirements. The Congress can restrict obligational authority for another \$5 million until the Secretary of Defense determines that the planned product improvement program is the most effective alternative for accomplishing the mission.

Request Exceeds Requirements

The Brilliant Antiarmor Submunition project office included about \$7 million in the request in anticipation of congressional and higher command reductions to the appropriation before release to the project office. Submunitions program management officials stated that fiscal year 1993 reductions included a 3-percent general reduction, 1.5 percent designated for small business innovative research, and amounts withheld for closed accounts. However, the request can be reduced by \$7 million because (1) the funding was not planned to meet program requirements; (2) general reductions do not occur every year; (3) the Army, not the individual projects, is tasked to provide funding for small business

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

research; and (4) amounts withheld for closed accounts are contingency funds, rather than actual needs.

The project manager stated that all funds requested were required for the program. He stated that the total requirement for contractor funding for fiscal year 1994 was uncertain because the contract was being renegotiated. The deputy project manager reiterated that the project office does not control the funds that are used for small business innovative research (\$1.8 million for the Brilliant Antiarmor Submunition) because the Army removes the funding before the appropriation reaches the project office.

We agree that the requirements for program funding are uncertain. However, program documents did not support a requirement for the entire \$117 million. In addition, program officials informed us that the contract renegotiation will include a decreased scope of work as well as a program stretchout. Furthermore, we note cost estimates on which budget submissions are based include amounts for risk.

We also agree that the project office does not receive the amount of funds that are withheld for small business innovative research. However, we note that authorizing legislation indicates that the Army, not the individual project office, is tasked to provide funding for small business innovative research.

Product Improvement Program

The Army requested \$13.1 million to continue a study for an improved warhead and seeker. However, the Army has not determined that the submunition improvement is the most efficient and effective alternative for accomplishing the mission. There are other alternatives that the Army and the other services have proposed for at least a part of this mission. For example, the Army Tactical Missile System improvement is designed to, among other tasks, engage mobile missile launchers, and the Air Force's Joint Direct Attack Munitions Program is also to accomplish that task. An official from the Office of the Assistant Secretary of the Army for Research, Development, and Acquisition said that the systems were complementary, rather than duplicative. The Congress, thus, can restrict obligational authority for the product improvement program until the Secretary of Defense determines the most cost-effective system(s) for that mission.

The project manager said that \$8.1 million for fiscal year 1994 would be required to complete the initial study and provide data needed to assess

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

the cost-effectiveness of alternatives. If the Congress wishes to fund studies from the Brilliant Antiarmor Submunition's appropriation, \$5 million of the request can be restricted until the alternatives are assessed.

Table I.6: Brilliant Antiarmor Submunition Funding/Request and Potential Reduction and Restriction

Budget line	Fiscal year		
	1992	1993	1994
	127	\$118.286	\$114.835
Potential reduction	•	•	7.000
Potential restriction	•	•	5.000

Aviation-Advanced Development

For fiscal year 1993, the Congress provided approximately \$16.3 million to the Army for Aviation-Advanced Development. Included in this amount was \$11.1 million for Aviation Life Support Equipment, \$2.4 million more than the Army had sought. This project provides for the engineering development of support equipment that is needed for Army air crews' survival on the battlefield.

Results of Analysis

Unless the Congress remains convinced that these funds are needed, the Congress can rescind \$2.4 million of the Army's fiscal year 1993 unobligated funds for Aviation-Advanced Development because the Army has no plans to expend these funds for the program for which they were provided. A project official said there were no requirements for these funds.

Table I.7: Aviation-Advanced Development Funding/Request and Potential Rescission

Budget line	Fiscal year		
	1992	1993	1994
	89	\$13.681	\$16.304
Potential rescission	•	2.400	•

Other Missile Product Improvement Programs

The Army included funding for the Army Tactical Missile System in its request for other missile product improvement programs. The missile system is a surface-to-surface missile capable of destroying targets in the rear area of an enemy's defense. The missiles are fired from a modified Multiple Launch Rocket System launcher and are intended for use

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

primarily against surface-to-surface missile sites; air defense systems; command, control, and communication sites; and other high-value military targets.

The Army plans to begin a product improvement for the missile system in fiscal year 1994 in order to engage similar targets at longer ranges as well as mobile missile launchers. The program's goal is to provide more accurate information to the missile's guidance system and increase the speed and range of the missile.

Results of Analysis

The Army's fiscal year 1994 request of approximately \$66.4 million for other missile product improvement programs includes \$25.8 million for the Army Tactical Missile System. The Congress can restrict obligational authority for \$16.9 million of that amount until the improvement program is determined to be the most cost-effective method of accomplishing the mission.

The \$25.8 million request includes \$8.9 million for a DOD analysis—Joint Precision Strike Demonstration—and \$16.9 million for efforts related to the improvement program. However, the Army has not determined that the improvement is the most cost-effective solution for accomplishing the mission. There are other alternatives that the Army and the other services have proposed for at least part of this mission. Two alternatives are the Army's improvement to the Brilliant Antiarmor Submunition program to engage mobile missile launchers and the Air Force's Joint Direct Attack Munitions program. Therefore, the Congress can restrict obligational authority for \$16.9 million until the Secretary of Defense determines that the product improvement program is the most efficient and effective system for accomplishing the mission.

The deputy project manager agreed that the improvement program has common targets with other improvement programs, yet he and other Army and Air Force officials maintained that the systems are complementary rather than duplicative. The deputy also said that (1) funding would not be required for the Army Tactical Missile System improvement program until December 1993 and (2) a cost-effectiveness analysis would be completed by that time.

**Appendix I
Potential Reductions, Rescissions, and
Restrictions to Army Research,
Development, Test, and Evaluation
Programs**

**Table I.8: Other Missile Product
Improvement Programs
Funding/Request and Potential
Restriction**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994 ^a
154	\$54.420	\$4.729	\$66.438
Potential restriction	•	•	16.900

^aOur review of this budget line included only the \$25.8 million for the Army Tactical Missile System budget request.

Potential Reductions and Rescissions in Navy RDT&E Programs

We identified about \$8.4 million in potential reductions in the Navy's fiscal year 1994 RDT&E request and about \$18.5 million in potential rescissions in the Navy's fiscal years 1992 and 1993 funding. The following section provides a brief description of our analysis and proposed actions by program. The proposed actions are summarized in table II.1.

Table II.1: Summary of Potential Reductions and Rescissions in Navy Programs

Dollars in millions

Program	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions	See page
Generic Logistics Research and Development Technology Demonstrations	•	\$1.484	•	17
Advanced Anti-Submarine Warfare Technology	•	2.824	•	18
Satellite Laser Communications	•	14.226	•	18
Electronic Warfare Development	\$8.361	•	•	19
Total	\$8.361	\$18.534	•	

Generic Logistics Research and Development Technology Demonstrations

This line item funds development studies to demonstrate the feasibility of using advanced technology to improve future operations in Navy logistics areas. One of the studies, the Rapid Acquisition of Manufactured Parts, is to evaluate the technologies that a depot maintenance facility uses and to demonstrate that the use of advanced technologies can reduce manufacturing costs and lead times for spare and replacement parts. The Philadelphia Naval Shipyard maintenance facility is scheduled for a Rapid Acquisition of Manufactured Parts study.

Results of Analysis

The Congress can rescind about \$1.5 million of the Navy's fiscal year 1993 funds of approximately \$28.5 million for a Rapid Acquisition of Manufactured Parts study of the maintenance facility at the Philadelphia Naval Shipyard because the study is not appropriate. The Philadelphia Naval Shipyard is scheduled for closure under the 1991 Defense Base Closure and Realignment Commission process.

Table II.2: Generic Logistics Research and Development Technology Demonstrations Funding/Request and Potential Rescission

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
25	\$17.838	\$28.549	\$13.720
Potential rescission	•	1.484	•

Advanced Anti-Submarine Warfare Technology

The Navy is shifting its focus from "blue water" anti-submarine warfare to shallow water anti-submarine warfare to address regional conflict scenarios. The Advanced Anti-Submarine Warfare Technology program is designed to transition technology developments into existing and future systems to ensure that U.S. naval forces maintain their technological advantage with a minimal investment.

Fiscal year 1993 funds of about \$74.8 million provided for seven technology transition projects. These projects were (1) Undersea Warfare Advanced Technology Demonstration (approximately \$13.9 million), (2) Critical Sea Tests (approximately \$27.8 million), (3) Advanced Deployable Array (approximately \$3.6 million), (4) Advanced Collection Technology (approximately \$10.5 million), (5) Anti-Submarine Warfare Target (\$2 million), (6) Low Frequency Technology (approximately \$14.2 million), and (7) Shallow Water Anti-Submarine Warfare System (approximately \$2.8 million).

Results of Analysis

The Congress can rescind approximately \$2.8 million of the Navy's fiscal year 1993 funds for the Shallow Water Anti-Submarine Warfare project because the project duplicates ongoing work. According to Navy program officials, the Shallow Water Anti-Submarine Warfare project duplicates projects such as those in the Undersea Surveillance and Weapons Technology program.

Table II.3: Advanced Anti-Submarine Warfare Technology Funding/Request and Potential Rescission

Budget line	Fiscal year		
	1992	1993	1994
	26	\$50.908	\$74.838
Potential rescission	•	2.824	•

Satellite Laser Communications

In fiscal year 1992, the Congress provided \$10 million to study the feasibility of using laser technology to communicate with submarines. In fiscal year 1993, the Congress provided an additional \$15 million and directed the Navy to use the total amount of \$25 million to (1) plan and execute a fleet demonstration of a laser communications system between an aircraft and a submarine and (2) plan a follow-on submarine laser communications system, to include the evaluation of effectiveness and cost of satellite versus those of aircraft.

Results of Analysis

Unless the Congress remains convinced that these funds are needed, the Congress can rescind the fiscal year 1993 funding of about \$14.2 million for satellite laser communications because the Navy does not plan to use the funds for the purposes for which they were provided.

The program executive officer for the Satellite Laser Communications program told us that the Navy has adequate submarine communications capabilities and does not need additional systems. He also told us that the Navy had informed the Congress that it would not use fiscal years 1992 and 1993 funds for laser communications development and that the development of laser technology as another means for submarine communications is no longer advisable.

Table II.4: Satellite Laser Communications Funding and Potential Rescission

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
32	\$10.000	\$14.226	•
Potential rescission	•	14.226	•

Electronic Warfare Development

The Electronic Warfare Development program includes several projects that are directed at the development of electronic warfare systems for the Navy. One project involves the development of the AN/ALQ-165 airborne self protection jammer, which is designed to provide defensive electromagnetic countermeasures for the self-protection of the F/A-18E aircraft.

Results of Analysis

The Navy's fiscal year 1994 budget request of about \$128.9 million for the electronic warfare development program can be reduced by approximately \$8.4 million because the Navy's budget justification documents show that this amount was for the AN/ALQ-165 airborne self protection jammer project. The project was terminated in late 1992 because the Navy's August 1992 operational evaluation report found that the AN/ALQ-165 jammer was neither operationally suitable nor operationally effective. In December 1992, the Assistant Secretary of the Navy, Research, Development, and Acquisition directed that all AN/ALQ-165 jammer production contracts be terminated.

**Appendix II
Potential Reductions and Rescissions in
Navy RDT&E Programs**

**Table II.5: Electronic Warfare
Development Funding/Request and
Potential Reduction**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
109	\$73.674	\$134.377	\$128.850
Potential reduction	•	•	8.361

Potential Reductions, Rescissions, and Restrictions to Air Force RDT&E Programs

We identified about \$415.3 million in potential reductions in the Air Force's fiscal year 1994 RDT&E request, about \$7.4 million in potential rescissions in the Air Force's fiscal years 1992 and 1993 funding, and about \$142.4 million in potential restrictions to the Air Force's obligational authority for fiscal year 1994 requests. The following section provides a brief description of our analysis and proposed actions by program. The proposed actions are summarized in table III.1.

Table III.1: Summary of Potential Reductions, Rescissions, and Restrictions to Air Force Programs

Dollars in millions

Program	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions	See page
National Aero-Space Plane Technology Program	•	•	\$30.000	21
Advanced Cruise Missile Program	•	\$6.373	•	23
Defense Support Program-Ground Station Upgrade	•	1.000	•	24
Specialized Undergraduate Pilot Training	\$38.375	•	•	24
F-22 Advanced Tactical Fighter	325.800	•	•	26
Night/ Precision Attack	46.710	•	35.500	27
F-16 Squadrons	4.400	•	23.000	28
Spacelifter	•	•	53.906	29
Total	\$415.285	\$7.373	\$142.406	

National Aero-Space Plane Technology Program

The National Aero-Space Plane Technology Program is a joint DOD and National Aeronautics and Space Administration (NASA) technology development and demonstration program. The program's goal is to provide the technological basis for future space launch and hypersonic flight vehicles by developing critical or enabling technologies, such as a scramjet engine. DOD and NASA intended to demonstrate these technologies by building and testing the X-30, a manned experimental flight vehicle. The Air Force, the lead agency, has requested approximately \$43.3 million in fiscal year 1994, while NASA has requested \$80 million.

Results of Analysis

The Congress can restrict obligational authority for \$30 million of the total of about \$123.3 million requested for fiscal year 1994 pending decisions on the aerospace plane program's future direction and resolution of programmatic and funding concerns. The balance of the request is sufficient to complete efforts already started.

Under previous plans, a decision had been scheduled for September 1993 on whether to enter the program's next phase and begin building the X-30. However, large increases in the baseline program's projected cost (from the original estimate of about \$3.1 billion in 1986 to \$17 billion in January 1992), funding constraints, and many technical concerns caused DOD and NASA to reconsider entering the next phase and led to efforts to restructure the current contract and associated technical efforts.

The program office proposed conducting a series of flight test experiments and a concurrent ground test effort through the turn of the century. As of August 1993, however, the Office of Science and Technology Policy, DOD, and NASA had not reached consensus on the program's future direction and appropriate funding level.

In our June 1993 report on the program,¹ we made several recommendations to the Director of the Office of Science and Technology Policy, the Secretary of Defense, and the Administrator of NASA, that, if implemented, would (1) better focus the program's long-term objectives and goals, (2) assure that sufficient funds are budgeted to execute the program's next phase, and (3) allow sufficient time to initiate required contractual action and properly plan future efforts. We also recommended that the Congress consider restricting DOD and NASA from obligating any funds appropriated for fiscal year 1994 beyond those necessary to complete the current efforts until DOD and NASA complete certain tasks. If implemented, this recommendation would restrict the obligational authority of \$30 million in fiscal year 1994 funds because these funds are to be used to initiate future development efforts or to conduct additional testing.

Both NASA and Air Force officials agreed that our recommendations, if implemented, would provide better program stability and focus. Program officials had no comment concerning the proposed restriction of the fiscal year 1994 funding. NASA officials, however, believe restricting the fiscal year 1994 funds would be a burden to effective planning and contracting. While this funding restriction can be imposed upon NASA, the Air Force, or a combination of both, the table shows it applying only to the Air Force.

¹National Aero-Space Plane: A Need for Program Direction and Funding Decisions (GAO/NSIAD-93-207, June 18, 1993).

**Appendix III
Potential Reductions, Rescissions, and
Restrictions to Air Force RDT&E Programs**

**Table III.2: National Aero-Space Plane
Technology Program Funding/Request
and Potential Restriction**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
29	\$198.114	\$141.244	\$43.259
Potential restriction	•	•	30.000

**Advanced Cruise
Missile Program**

The Advanced Cruise Missile is a subsonic, turbo-fan powered missile equipped with a nuclear warhead. The Advanced Cruise Missile is designed to be less detectable and have greater range, accuracy, and operational flexibility than the Air Launched Cruise Missile. The Air Force began developing the Advanced Cruise Missile in 1982 and has experienced significant development and production problems leading to cost growth and schedule delays. Development of the Advanced Cruise Missile is complete; however, development continues on depot support equipment, software, and other items. The Air Force has requested approximately \$25.4 million in fiscal year 1994 Advanced Cruise Missile RDT&E funds, primarily for depot activation.

Results of Analysis

The Congress can rescind about \$6.4 million of the Advanced Cruise Missile program's fiscal year 1993 unobligated funds because the Air Force has no identified requirement for these funds. To illustrate the excess, the Air Force has \$7.2 million in unused fiscal year 1992 funds that expire September 30, 1993.

While acknowledging that they have no current requirements for the approximately \$6.4 million, program officials said these funds should be retained to fund some future potential requirements. However, about \$6.4 million is available for rescission because the Air Force does not have a specific purpose for the funds after a full year.

**Table III.3: Advanced Cruise Missile
Funding/Request and Potential
Rescission**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
54	\$39.300	\$19.543	\$25.393
Potential rescission	•	6.373	•

Defense Support Program-Ground Station Upgrade

The Defense Support Program is a strategic surveillance and early warning satellite system with an infrared capability to detect ballistic missile launches. It is designed to provide near real-time detection information to support DOD's tactical warning and attack mission. The program is supported by a network of fixed and mobile ground stations that process and disseminate information to military commanders worldwide.

In May 1987, the Air Force began procuring new computer hardware and software for the ground stations. The new equipment was designed to replace the existing hardware and software and enhance operational capability and address an evolving threat. However, because of significant cost growth and schedule slippage, the Air Force terminated this effort, known as System I and the Ground Computer Change Out programs, in December 1992. The Air Force now plans to upgrade the computer software and replace computer hardware.

Results of Analysis

The Congress can rescind \$1 million from the Air Force's Defense Support Program fiscal year 1993 funds. The \$1 million in unobligated fiscal year 1993 funds to be used for System I contract termination is not needed. According to a DOD official, sufficient funds already have been obligated for the termination of the System I contract. Program officials stated that, if these funds were to be retained by the program office, the \$1 million should be used as a management reserve to address uncertainties in such efforts as the Satellite Readout Station Upgrade.

Table III.4: Defense Support Program-Ground Station Upgrade Funding/Request and Potential Rescission

Budget line	Fiscal year		
	1992	1993	1994
84	•	\$49.081	\$66.777
Potential rescission	•	1.000	•

Specialized Undergraduate Pilot Training

The Air Force's Specialized Undergraduate Pilot Training program includes funding for the Joint Primary Training System. The training system is a joint Air Force and Navy venture to replace the services' primary trainer aircraft (T-37 and T-34, respectively). The program includes the purchase of aircraft, simulators, ground-based training devices, instructional courseware, and logistical support. The training system is to be used to train entry level students in the fundamentals of flying. The Air Force's fiscal year 1994 request for approximately

\$44 million includes about \$38.4 million for the initial test aircraft and related costs and \$3.2 million for program office support costs.

Results of Analysis

The Air Force's fiscal year 1994 request of approximately \$44 million can be reduced by about \$38.4 million because the contract award date for the initial test aircraft planned for August 1994 is expected to be delayed until fiscal year 1995.

Several factors have caused some slippage in the planned schedule for source selection, and further slippage is probable. On July 7, 1993, the Under Secretary of Defense (Acquisition) issued formal direction to the Air Force.

- The Under Secretaries directed a one-contract initial acquisition strategy with the prime contractor responsible for integration of the training system during development. This is a much different strategy than that used by the Air Force in establishing its current plans and schedule. The Air Force had been planning to issue separate contracts for the aircraft and ground-based training system.
- Some changes and additions to the strategy and source selection process were also directed that must be met before the Air Force receives milestone decision authority from the Office of the Secretary of Defense. The Air Force is now required to (1) develop source selection criteria to clearly favor proposals involving lowest developmental risk and lowest total system cost, (2) resolve all test and evaluation master plan issues, and (3) ensure that the training system's program is fully consistent with DOD's policies on women in combat. On this last point, the training system must accommodate not less than 80 percent of the eligible female pilot candidates. An Office of the Secretary of Defense working group is studying size and design requirements, and this study might result in changes having to be made in some contractors' training system candidates.

This direction came months after the Air Force first developed the schedule for source selection and established a contract award date in August 1994. Release of the final request for proposal is now expected in January 1994—about 3 months later than planned—and other schedule dates are also likely to slip.

DOD has not yet specified the amount of "missionization" (modifications to commercial designs needed to meet program requirements) that will be

permitted following operational evaluation of candidates and selection of the prime contractor. Training system program officials said their intent is to limit such modifications and require that the basic design, engine, and flying characteristics be standardized at the time of operational evaluation.

Program and Office of the Secretary of Defense officials also acknowledged that the contract award is likely to slip into fiscal year 1995 and agreed that fiscal year 1994 funds could be reduced. Officials said they needed \$3.2 million in fiscal year 1994 funding for program office and test support costs.

Table III.5: Specialized Undergraduate Pilot Training Funding/Request and Potential Reduction

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
100	\$4.196	\$4.392	\$43.971
Potential reduction	•	•	38.375

F-22 Advanced Tactical Fighter

The F-22 is to replace the F-15 as the Air Force's next air superiority fighter. The F-22 entered development in 1991, and the Air Force plans to request production funding for fiscal year 1996. Plans are to achieve initial operational capability in 2003.

Results of Analysis

The Air Force's fiscal year 1994 request of about \$2,251 million for the F-22 can be reduced by \$325.8 million because the projected threat does not appear to compel a faster pace of development.

F-22 program officials maintain that a reduction of \$325.8 million in the fiscal year 1994 budget request would cause a 6- to 9-month program delay and an estimated cost increase of \$1 billion through fiscal year 2001. DOD believes that, no matter what the threat, the F-22 will be considerably more efficient at the air superiority mission than the F-15. However, our analysis indicates that the performance characteristics of the existing F-15 weapon system are superior to those of the projected threat well beyond the planned F-22 introduction in 2003. We believe that maintaining the fiscal year 1993 level of funding would be prudent for this reason and because of the unknown impact of pending DOD decisions about mission requirements and affordability of tactical aircraft.

**Appendix III
Potential Reductions, Rescissions, and
Restrictions to Air Force RDT&E Programs**

**Table III.6: F-22 Advanced Tactical
Fighter Funding/Request and Potential
Reduction**

Budget line	Fiscal year		
	1992	1993	1994
	Dollars in millions		
102	\$1,606.804	\$1,925.199	\$2,250.997
Potential reduction	•	•	325.800

Night/Precision Attack

The Night/Precision Attack program contains the night attack project and the low altitude navigation and targeting infrared-for-night project. The first project, night attack, is to develop, test, and evaluate night vision technologies for future enhancement to F-16 and A-10 aircraft. The second project, infrared-for-night, is to provide the capability to conduct close air support and interdiction missions at night and in conditions of limited visibility with laser guided weapons. The Air Force's fiscal year 1994 budget request includes approximately \$82.2 million for the Night/Precision Attack program.

Results of Analysis

The Congress can reduce the Air Force's fiscal year 1994 budget request by about \$46.7 million for the Night/Precision Attack program and restrict obligational authority for the remaining \$35.5 million. The Office of the Secretary of Defense and the Air Force have not reached agreement on which aircraft should be modified for the close air support mission, how many should be modified, and what those modifications should be. As a result, the Congress restricted the Air Force's fiscal year 1993 funding for close air support, which includes the Night/Precision Attack program. Although a Defense Acquisition Board meeting was scheduled to discuss Air Force plans for the program in December 1992, it was not held because the Office of the Secretary of Defense requested the Air Force to further support its planned program. A Board meeting is not currently scheduled, but an Office of the Secretary of Defense official said one may be held by December 1993.

The Air Force Night/Precision Attack program manager said the Air Force requires only \$35.5 million in fiscal year 1994 funding to support the program that the Office of the Secretary of Defense wants or only \$24.4 million to support the program that the Air Force wants. Therefore, assuming the higher cost program is selected, about \$46.7 million is excess to the fiscal year 1994 needs. Also, the \$35.5 million that is needed to fund the Office of the Secretary of Defense's program can be restricted until a decision is made on which program is selected. As of September 22, 1993,

the differences between the Office of the Secretary of Defense and the Air Force had not been resolved.

**Table III.7: Night/Precision Attack
 Funding/Request and Potential
 Reduction and Restriction**

Dollars in millions

Budget line	Fiscal year		
	1992	1993	1994
104	\$3.125	\$25.094	\$82.210
Potential reduction	•	•	46.710
Potential restriction	•	•	35.500

F-16 Squadrons

The Air Force's fiscal year 1994 RDT&E budget request for the F-16 includes \$23 million to define requirements for close air support and \$4.4 million for multirole fighter concept development. The Air Force is considering the F-16 for the close air support mission of providing support to friendly forces that are close to enemy forces. The multirole fighter was envisioned as a future aircraft designed for a variety of missions.

Results of Analysis

The Congress can restrict the Air Force's obligational authority for \$23 million requested in fiscal year 1994 for development efforts related to modifications of F-16s for close air support because the Office of the Secretary of Defense and the Air Force have not agreed on which configuration of the F-16 should be modified for the close air support mission, how many aircraft should be modified, and what those modifications should be. Further, the Congress can reduce the request by \$4.4 million for the multirole fighter program because the Secretary of Defense canceled the program in September 1993.

Close Air Support

As a result of the Office of the Secretary of Defense and the Air Force's disagreement regarding the F-16 and the close air support mission, the Congress restricted all \$3.5 million appropriated for the Air Force's fiscal year 1993 funding for close air support. A Defense Acquisition Board meeting was scheduled to discuss Air Force plans for the close air support program in December 1992, but it was not held because the Office of the Secretary of Defense requested the Air Force to further justify its planned program. A Board meeting is not currently scheduled.

Because the fiscal year 1993 funds were restricted by the Congress and the disagreement still is not resolved, the Congress can restrict the Air Force's

authority to obligate fiscal year 1994 funds. The funds can be released and the Air Force can proceed with accomplishing early planning tasks, such as defining its requirements and setting specifications, when the Office of the Secretary of Defense and the Air Force agree on the close air support program.

Multirole Fighter

In the fiscal year 1993 request for development planning projects, the Air Force requested \$4.9 million to initiate multirole fighter studies. The Congress denied the request because it believed it was too early to decide whether an entirely new aircraft should be developed. The Congress stated that funds approved for development planning could be used for multirole fighter studies only after the Air Force submitted a detailed justification and received approval from the Committees on Appropriations.

As a result of the recent DOD bottom-up review, the Secretary of Defense canceled the multirole fighter program. Thus, the Congress can reduce the fiscal year 1994 request for funding of the multirole fighter program because it was canceled.

**Table III.8: F-16 Squadrons
Funding/Request and Potential
Reduction and Restriction**

Budget line	Fiscal year		
	1992	1993	1994
	130	\$147.661	\$109.409
Potential reduction (multirole fighter)	•	•	4.400
Potential restriction (close air support)	•	•	23.000

Spacelifter

The Spacelifter is a new fiscal year 1994 program established to replace the National Launch System program that was terminated in fiscal year 1993. The Spacelifter is designed to provide DOD, as well as civil and commercial users, with a medium-to-heavy launch capability by the first decade of the next century.

Results of Analysis

To prevent premature commitment to a long-term effort on the Spacelifter program, the Congress can restrict Air Force obligational authority on the fiscal year 1994 request for approximately \$53.9 million. The Air Force and DOD have not resolved schedule, requirements, and funding/affordability issues associated with the program.

**Appendix III
Potential Reductions, Rescissions, and
Restrictions to Air Force RDT&E Programs**

Several issues must be resolved before the program can be initiated. Most importantly, as noted by the Vice President's Space Policy Advisory Board, no strong economic imperative or critical payload requirement drives the development of a new space launch capability. The report further noted that launch rates are declining, which will extend the life of the current Delta, Atlas, and Titan family of vehicles. For example, the Titan IV program office estimates it can support required satellite launches of Defense Support Program, Milstar, Follow-on Early Warning System, NASA, and classified programs through 2014, if its follow-on buy of launch vehicles proceeds as scheduled.

Also, a validated mission needs statement for the Spacelifter program should be completed before the program begins its initial development. According to DOD Instruction 5000.2, DOD entities shall document deficiencies in current capabilities and opportunities to provide new capabilities in a mission needs statement. Air Force officials agreed that the validated document is essential to begin the first phase of the program—concept exploration. Although the Air Force Space Command has prepared a draft mission needs statement, an Air Force Space Command official was unsure when the document would be approved by the head of the U.S. Space Command.

The Air Force's obligational authority on the fiscal year 1994 budget request for approximately \$53.9 million for Spacelifter can be restricted until the Air Force and DOD provide the Congress assurance that schedule, funding, and requirements issues are resolved.

**Table III.9: Spacelifter
Funding/Request and Potential
Restriction**

Dollars in millions			
Budget line	Fiscal year		
	1992	1993	1994
190	\$48.673	\$9.435	\$53.906
Potential restriction	•	•	53.906

Potential Reductions and Restrictions to Multiservice RDT&E Programs

We identified about \$34.8 million in potential reductions in the Air Force's and about \$27.2 million in potential restrictions to the Navy's obligational authority for fiscal year 1994 RDT&E requests. The following section provides a brief description of our analysis and proposed actions by program. The proposed actions are summarized in table IV.1.

Table IV.1: Summary of Potential Reductions and Restrictions to Multiservice Programs

Dollars in millions

Program	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions	See page
Advanced Tactical Air Reconnaissance System, Air Force	\$34.838	•	•	31
Advanced Tactical Air Reconnaissance System, Navy	•	•	\$27.217	31
Total	\$34.838	•	\$27.217	

Advanced Tactical Air Reconnaissance System

The fiscal year 1994 request for the Advanced Tactical Air Reconnaissance System is included in the requests for the Air Force Follow-On Tactical Reconnaissance System and the Navy Tactical Airborne Reconnaissance System. The Advanced Tactical Air Reconnaissance System program was being designed to replace obsolete wet-film photographic reconnaissance systems that DOD officials stated were not adequate during Operation Desert Shield/Storm. Aircraft equipped with the reconnaissance system's sensor suites were to provide near-real time collection of battlefield information for tactical use such as bomb damage assessment. The system was a joint Air Force and Navy program. The Air Force was the executive service for the development of the program.

Results of Analysis

The Congress can reduce the Air Force's fiscal year 1994 budget request for the Advanced Tactical Air Reconnaissance System by about \$34.8 million because the system's contract was terminated effective June 25, 1993, due to cost, schedule, and performance problems. About \$20 million in remaining funds is for developing a replacement program strategy to meet operational requirements for tactical reconnaissance. In addition, the Congress can restrict obligational authority for approximately \$27.2 million of the Navy's fiscal year 1994 request for the system until the Navy develops a viable replacement program strategy to meet its operational requirements for tactical reconnaissance and advises the Congress of that plan.

**Appendix IV
Potential Reductions and Restrictions to
Multiservice RDT&E Programs**

Air Force program officials agreed that the Air Force's fiscal year 1994 budget request can be reduced by approximately \$34.8 million. A Navy program official expressed concern that restricting about \$27.2 million of the Navy's fiscal year 1994 budget request until a program strategy is developed might impede Navy efforts to continue testing sensors already received. However, until the Navy decides what sensors it plans to use, the Navy may not be testing the sensors that will be selected for the replacement program.

**Table IV.2: Advanced Tactical Air
Reconnaissance System
Funding/Request and Potential
Reduction and Restriction**

Budget line	Fiscal year		
	1992	1993	1994
138 (Air Force)	\$87.391	\$58.362	\$65.338
Potential reduction	•	•	34.838
46 (Navy)	13.776	14.444	30.358
Potential restriction	•	•	27.217

Potential Restrictions to Defensewide RDT&E Programs

We identified about \$766.8 million in potential restrictions to the Defensewide fiscal year 1994 RDT&E request. The following section provides a brief description of our analysis and proposed actions by program. The proposed actions are summarized in table V.1.

Table V.1: Summary of Potential Restrictions to Defensewide Programs

Dollars in millions

Program	Potential fiscal year 1994 reductions	Potential prior year rescissions	Potential restrictions	See page
Theater Missile Defenses	•	•	\$718.381	33
Theater Missile Defenses (Engineering and Manufacturing Development)	•	•	48.457	35
Total	•	•	\$766.838	

Theater Missile Defenses

The Missile Defense Act of 1991 established the necessity of a ballistic missile defense for the United States and its allies and U.S. forces deployed worldwide. The Ballistic Missile Defense Organization (BMDO) was charged with developing a theater missile defense. To accomplish this goal, BMDO plans a two-tier defense. The upper tier defense, which will provide for wide area defense, consists of the Theater High Altitude Area Defense missile system. The lower tier defense, which will defend critical assets, will be provided by the Patriot Advanced Capability-Three (PAC-3) missile system.

The Theater High Altitude Area Defense is a transportable antitactical ballistic missile system consisting of missiles, launchers, radars, and tactical operational centers. The Theater Missile Defense-Ground Based Radar, the radar supporting the Theater High Altitude Area Defense, is a mobile, ground-based radar that will provide early warning, target cuing, and missile fire control.

The lower tier mission will be filled by the PAC-3 missile system. The systems that are competing to be the PAC-3 missile are (1) the Extended Range Interceptor, which is designed to destroy missiles by colliding with them, and (2) the Patriot Multimode Missile, which includes seeker and explosive warhead improvements. BMDO plans to select a system for engineering and manufacturing development in February 1994.

Results of Analysis

The Congress can restrict obligational authority for about \$718.4 million (approximately \$484.3 million for the Theater High Altitude Area Defense missile and about \$234.1 million for the Theater Missile Defense-Ground Based Radar) of BMDO's approximate \$1.6 billion fiscal year 1994 request for Theater Missile Defense until a determination is made as to whether the area defense missile and the radar comply with the Anti-ballistic Missile Treaty.

Obligational authority can be restricted for BMDO's entire request for the area defense missile and the radar because there are questions concerning whether development of these systems complies with the treaty. In November 1992, the former Under Secretary of Defense (Acquisition) expressed concern regarding the area defense missile's unresolved treaty status because the treaty may preclude the development of some theater missile defense system capabilities. Although the treaty does not limit defenses against theater and tactical ballistic missiles, it does prohibit the development of mobile land-based systems that could defend against strategic missiles. The Under Secretary wanted to ensure a compliance determination as early as possible in the acquisition to minimize the likelihood of unnecessarily expending funds by designing a system that does not comply with the treaty.

Therefore, the Under Secretary mandated treaty compliance determination prior to the area defense missile's final design review, scheduled for November 1993. He further stated that the area defense missile should not proceed beyond the final design review until he certifies that it is compliant with the treaty.

According to a Theater High Altitude Area Defense project official, BMDO briefed the DOD Compliance Review Group in May 1993. However, according to the project manager, the group did not document its conclusions, and the Under Secretary has not certified that the area defense missile is compliant with the treaty—an action necessary to proceed beyond the final design review. In addition, the Senate Committee on Armed Services recently directed the Secretary of Defense to begin reviewing the Theater High Altitude area defense missile's compliance with the treaty.

The determination of the area defense missile's treaty compliance status directly impacts the ground-based radar. According to the ground-based radar deputy project manager, if the missile is not compliant with treaty provisions, the radar would also be noncompliant because it supports the

missile system. By itself, however, the radar is considered treaty compliant because the aperture of the radar is below the maximum level imposed by the treaty.

The area defense missile project manager said that restricting all fiscal year 1994 funding would severely affect program cost and schedule. He said that sufficient funding would be needed to continue basic program operations; however, he did not estimate the amount of funding required. In addition, a ground-based radar acquisition official stated that the radar also would require sufficient funding to continue basic operations, yet he did not estimate the amount of funding required. A BMDO official added that restriction of obligational authority for the entire appropriation for both systems would delay the final design review, which would cause a nonrecoverable program slippage. However, the Congress can restrict the entire fiscal year 1994 obligational authority until BMDO estimates and justifies the amount of funding required for basic operations. A program slippage may be preferable over spending funds to develop a system that is not treaty compliant.

**Table V.2: Theater Missile Defenses
Funding/Request and Potential
Restriction**

Budget line	Fiscal year		
	1992	1993	1994
75	•	\$1,018.110	\$1,636.304
Potential restriction	•	•	718.381

Theater Missile Defenses (Engineering and Manufacturing Development)

The Missile Defense Act of 1991 established the necessity of ballistic missile defense for the United States and its allies and worldwide U.S. forces. BMDO, charged with developing a theater missile defense, plans a two-tier defense. The upper tier will provide for wide area defense. The lower tier, to be used for defending critical assets, will be provided by the PAC-3 missile system.

The Patriot is a surface-to-air missile system that consists of a radar, ground support equipment, missile launchers, and missiles. An upgrade of the Patriot with an improved seeker and explosive warhead, the Patriot Multimode Interceptor, is competing against the Extended Range Interceptor for the role of the PAC-3 missile. One of these two missile development systems will be selected to transition to engineering and manufacturing and will fulfill the PAC-3 role.

Results of Analysis

BMDO requested approximately \$50.4 million in fiscal year 1994 for Theater Missile Defense engineering and manufacturing development. The Congress can restrict obligational authority for about \$48.5 million until the PAC-3 missile is selected. BMDO plans to use about \$48.5 million for Patriot multimode missile engineering and manufacturing development. However, BMDO will not know if Patriot multimode engineering and manufacturing development funds are required until the decision is made as to whether the Patriot multimode or the Extended Range Interceptor will be selected for the PAC-3 role. That selection decision has been postponed until February 1994.

A BMDO official stated that one congressional authorization committee has recommended that if engineering and manufacturing development is delayed, the funding could be used to continue demonstration and validation. He expressed concern that a restriction would prohibit them from use of the funds for these efforts. However, the funds were requested for engineering and manufacturing development, not demonstration and validation.

Table V.3: Theater Missile Defenses (Engineering and Manufacturing Development) Funding/Request and Potential Restriction

Budget line	Fiscal year		
	1992	1993	1994
82	•	\$9.390	\$50.410
Potential restriction	•	•	48.457

Scope and Methodology

We selected for detailed review DOD RDT&E programs that we identified from our ongoing assignments as well as the survey phase of this assignment as having cost, schedule, performance, or programmatic issues. To achieve our objectives, we interviewed program officials and reviewed program documentation such as budget requests and justifications, monthly program status reports, correspondence, briefing reports, and accounting and financial reports. We discussed the facts in this report with DOD and program officials and incorporated their comments as appropriate.

We performed our work at numerous DOD and military service locations. For example, we visited the Air Force Materiel Command, Wright-Patterson Air Force Base, Ohio; Army Missile Command and U.S. Ballistic Missile Defense Organization, Huntsville, Alabama; Naval Sea Systems, Naval Space and Warfare, and Naval Air Systems Commands, and the Office of the Chief of Naval Research, Arlington, Virginia; Air Force Materiel Command Electronics Systems Center, Hanscom Air Force Base, Massachusetts; Army Communications-Electronics Command, Fort Monmouth, New Jersey; Army Tank-Automotive Command, Warren, Michigan; Army Aviation and Troop Command, St. Louis, Missouri; Air Force Space and Missile System Center, Los Angeles, California; and U.S. and Air Force Space Commands, Colorado Springs, Colorado. We also contacted program representatives in the Office of the Secretary of Defense and the Departments of the Army, the Navy, and the Air Force.

We performed our review from October 1992 through September 1993 in accordance with generally accepted government auditing standards.

Major Contributors to This Report

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

Brad H. Hathaway, Associate Director
Thomas J. Schulz, Associate Director
Howard R. Manning, Project Director
John J. D'Esopo
Raymond Dunham
Jack B. Guin
Steven F. Kuhta
Robert D. Murphy
Derek B. Stewart
Robert J. Stolba
William L. Wright, Jr.
Lawrence W. Gaston
Raymond W. Allen
Wanda M. Slagle
Sarah J. Brady
Tana M. Davis
Sharon E. Sweeney

Atlanta Regional Office

Thomas W. Gilliam
Dayna L. Foster
Marion S. Chastain
Frederick W. Felder
Carol T. Mebane
Angel D. Sharma
Dana S. Solomon
John S. Warren, Jr.

Boston Regional Office

Edmund L. Kelley, Jr.
Martin F. Lobo
Joseph Rizzo, Jr.
Richard E. Silveira

Cincinnati Regional Office

Matthew R. Mongin
John M. Murphy, Jr.
Bruce D. Fairbairn
Timothy J. DiNapoli
Leonard L. Benson
Michael F. McGuire

**Appendix VII
Major Contributors to This Report**

John F. Seidl
George J. Buerger
Henry W. Sudbrink II
Michael W. Aiken
Edward R. Browning
Johnetta Gatlin-Brown
Tom C. Hewlett
Benjamin Jordan
Fred J. Naas
Don M. Springman

**Kansas City Regional
Office**

Gary L. Billen
Charles O. Burgess
Carole F. Coffey
Milton E. Roedder, Jr.
Lauri A. Bischof
Dora E. Navarro
Karen A. Rieger
Norman W. Trowbridge

**Los Angeles Regional
Office**

Sam Van Wagner
Dale M. Yuge
Frank Moore

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