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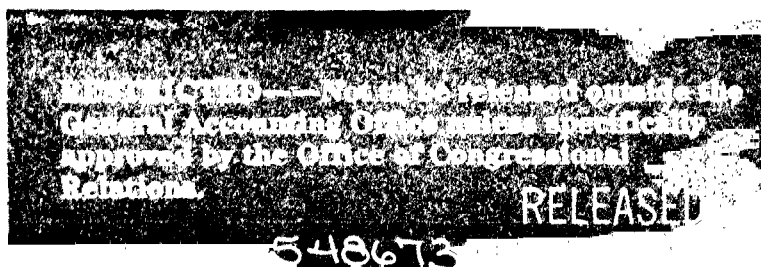
# AIRCRAFT MAINTENANCE

## Air Force Transferred and Eliminated Tasks to Address Funding Shortfalls



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

National Security and  
International Affairs Division

B-239422

June 7, 1990

The Honorable Earl Hutto  
Chairman, Subcommittee on Readiness  
Committee on Armed Services  
House of Representatives

Dear Mr. Chairman:

This report responds to your request that we evaluate the Air Force's efforts in fiscal years 1988 and 1989 to transfer aircraft maintenance tasks to the operating commands and eliminate and defer other maintenance tasks to address funding shortfalls. It discusses the effect of these actions on readiness, projected funding shortfalls, and aircraft depot maintenance requirements.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time we will send copies to interested parties and make copies available to others upon request.

Please contact me at (202) 275-4268 if you or your staff have any questions concerning the report. Major contributors to this report are listed in appendix II.

Sincerely yours,

A handwritten signature in cursive script that reads 'Nancy R. Kingsbury'.

Nancy R. Kingsbury  
Director  
Air Force Issues

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# Executive Summary

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## Purpose

In the budget request to the Congress in February 1988, the Air Force projected that total aircraft depot maintenance requirements exceeded funding by \$156 million and \$241 million in fiscal years 1988 and 1989, respectively. In response to these shortfalls, Air Force officials testified in March 1988 that the operating commands were being asked to do some depot work and that the Air Force Logistics Command was eliminating and deferring other depot maintenance tasks.

The Chairman, Subcommittee on Readiness, House Committee on Armed Services, requested that GAO review the transfer of maintenance tasks from the depots to the operating commands and determine whether such transfers duplicated depot activities, increased costs, and affected aircraft readiness. GAO subsequently agreed to determine the significance of the Logistics Command's elimination and deferral of maintenance requirements in offsetting funding shortfalls.

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## Background

The Logistics Command is responsible for aircraft depot maintenance, which includes major aircraft overhauls, periodic inspections, and installation of modifications. Aircraft depot maintenance is accomplished at the Air Logistics Centers, also known as depots, and contractor facilities. The operating commands, such as the Tactical Air Command and the Military Airlift Command, also accomplish less complex aircraft maintenance at bases using their own resources.

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## Results in Brief

During fiscal years 1988 and 1989, some depot maintenance tasks were transferred from the Logistics Command to the operating commands. GAO found that operating commands did not substantially duplicate current depot activities or significantly increase maintenance costs. The operating commands' efforts helped maintain aircraft readiness by allowing the Logistics Command to accomplish high-priority tasks. The results achieved in fiscal years 1988 and 1989 indicate that accomplishing some depot maintenance tasks at the operating bases is feasible, cost-effective, and contributes to improved readiness.

Air Force actions to eliminate or defer overstated and low-priority depot aircraft maintenance requirements did more to reduce the funding shortfall than the work accomplished by the operating commands. Even though a significant amount of work was eliminated and deferred, readiness was maintained, aircraft were not grounded due to a failure to perform scheduled maintenance, and safety-related, essential work was accomplished.

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Also, the severe funding shortfalls projected for fiscal years 1988 and 1989 did not occur. This results in questions about the validity of requirements and projected shortfalls presented in budget submissions. The Department of Defense and the Air Force have efforts underway to improve requirements determinations and budget submissions to the Congress.

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## Principal Findings

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### Depot Maintenance Tasks Transferred

Base maintenance personnel of the Tactical Air Command and the Military Airlift Command accomplished some maintenance and modernization tasks during fiscal years 1988 and 1989 that had been planned to be accomplished by the depots. Air Force officials could not identify and quantify all the tasks because many were accomplished along with normal base maintenance and separate records were not always kept. Available information and the officials' estimates, however, indicate that the tasks transferred in fiscal year 1988 were a relatively small portion of the total depot work load and that the number of tasks decreased in fiscal year 1989 and is expected to decline further in fiscal year 1990.

The maintenance tasks accomplished by the operating commands did not substantially duplicate depot activities. The Logistics Command and the operating commands jointly identified tasks that could be accomplished at bases. In most cases, base personnel supplemented depot personnel or accomplished maintenance that the Logistics Command had eliminated or deferred. For example, operating command personnel installed modifications that the Logistics Command had decided to delay, made inspections and repairs that had been eliminated from depot scheduled maintenance, and assisted depot field teams in accomplishing other tasks.

Accomplishing tasks at operating bases instead of depots did not significantly increase total maintenance costs and helped maintain aircraft readiness. Air Force officials stated that the operating commands absorbed the depot work loads without requiring additional base maintenance personnel, equipment, and facilities. Operating bases are staffed to meet wartime requirements and can expand peacetime operations—at least for a period of time—with existing resources. Air Force officials stated that the logistics system has a substantial degree of “elasticity,”

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which gives the Air Force flexibility in coping with changes in funding and work load. The officials added that accomplishing these necessary tasks at operating bases helped maintain readiness by allowing the Logistics Command to accomplish high-priority tasks.

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### Requirements Eliminated or Deferred

Logistics Command officials eliminated or deferred maintenance requirements that were not essential, safety related, or executable. For example, from fiscal years 1988 and 1989 programs, the officials eliminated inspections and paintings (except for severe corrosion control) and deferred the installation of nonsafety-related modifications. The officials also eliminated requirements that had been overstated in the amended fiscal years 1988/1989 budget submission. The officials said the budget included unexecutable items (tasks that could not be accomplished by the depots during the program year because of a lack of production capacity, parts, personnel, or for reasons other than a lack of funding), which overstated work that the depots could realistically accomplish.

As a result of these actions, the Air Force significantly reduced aircraft maintenance requirements from estimates in the February 1988 amended budget. For example, the fiscal year 1988 requirement of \$789 million was reduced by \$83 million to \$706 million in June 1988 primarily by eliminating unexecutable requirements. The requirement was subsequently reduced by about \$88 million by eliminating about \$60 million and deferring about \$28 million in specific maintenance tasks.

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### Funding Shortfalls Overstated

In its February 1988 amended budget request, the Air Force projected aircraft depot maintenance funding shortfalls of \$156 million in fiscal year 1988 and \$241 million in fiscal year 1989. By the end of fiscal year 1988, funding shortfalls were substantially reduced to \$28 million; furthermore, for fiscal year 1989, funding shortfalls were reduced to zero.

During fiscal years 1988 and 1989, the Air Force maintained overall readiness levels: mission capable rates (the percent of available aircraft capable of performing their mission) remained high, and aircraft were not grounded due to a failure to perform scheduled depot maintenance. Air Force officials were generally satisfied with the level of depot maintenance support provided to aircraft systems and stated that high-priority, mission-essential, and safety-related tasks had been accomplished.

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The Congress, in both fiscal years 1989 and 1990, appropriated additional funding for depot maintenance, some of which was used to eliminate aircraft maintenance funding shortfalls. The severe shortfalls projected for fiscal years 1988 and 1989 did not occur once officials eliminated overstated and low-priority work. The Office of the Secretary of Defense and the Air Force have efforts underway to improve depot maintenance requirements determinations and budget submissions.

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## **Recommendations**

GAO is not making recommendations in this report.

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## **Agency Comments**

The Department of Defense agreed with GAO's findings and stated it will continue to pursue and monitor efforts underway to improve depot maintenance requirements determinations.

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## Abbreviations

AFB	Air Force Base
AFLC	Air Force Logistics Command
ALC	Air Logistics Center
DOD	Department of Defense
GAO	General Accounting Office
MAC	Military Airlift Command
TAC	Tactical Air Command





# Introduction

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The Air Force services and repairs its aircraft and equipment to maintain and improve its warfighting capability. Aircraft, weapon systems, and equipment in the Air Force's inventory require maintenance throughout their useful life spans. Required maintenance ranges from routine oil changes to inspections, calibrations, and component replacement to modification or complete rebuild. The Air Force Logistics Command (AFLC) and the operating commands, which include the Tactical Air Command (TAC), Military Airlift Command (MAC), and Strategic Air Command, are jointly responsible for maintaining aircraft.

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## Air Force Aircraft Maintenance

The AFLC is responsible for depot maintenance, which includes major aircraft overhauls, modifications, and complete rebuilds of reparable parts and end items. Depot maintenance is performed at AFLC's Air Logistics Centers (ALC), also referred to as depots; contractor facilities; or by specialized depot or contractor teams deployed to operational sites. Depot tasks typically require more extensive shop facilities, equipment, and personnel with more specialized skills than are available at operating bases.

In fiscal years 1988 and 1989, depot maintenance for direct Air Force funded aircraft, including aircraft of the TAC and the Strategic Air Command, was funded by the depot maintenance and modernization<sup>1</sup> program in the Air Force's operation and maintenance appropriation. Most depot maintenance costs for MAC aircraft are paid for by the Airlift Service Industrial Fund, which is a revolving fund reimbursed by charges for airlift services provided to Department of Defense (DOD) organizations.

Operating commands are responsible for accomplishing maintenance at air bases on assigned aircraft. Base maintenance includes inspecting and servicing aircraft on the flightline, making structural repairs, and repairing and replacing damaged or unserviceable parts and components in shops at the main operating bases. Base maintenance is funded by the operating commands' own operation and maintenance resources.

Air Force regulations prescribe procedures and criteria for determining the appropriate level to perform specific maintenance tasks. The Air Force's objective is to accomplish maintenance at the lowest level that is

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<sup>1</sup>Modernization provides for the installation of equipment to improve aircraft or other equipment. At DOD's request, the Congress agreed to fund modernization from the procurement account beginning in fiscal year 1990.

consistent with economy, technical feasibility, and mission requirements. Repair level analyses, logistical support analyses, and cost studies are conducted during the design and acquisition of a weapon system to determine the appropriate level of maintenance. Factors such as the frequency and complexity of the repair process, the type or degree of skill specialization required, the need for extensive and specialized facilities and equipment, and related cost factors are considered in determining whether repair responsibility is assigned to bases or depots. The Air Force seeks to develop the support system that promotes the highest possible aircraft availability and ensures sustainability at a low life-cycle expense. Regulations also prescribe processes for later changing the level of maintenance based on operational experience and conditions.

## Determining Depot Requirements and Funding Requests

ALC officials develop and manage the annual depot maintenance program for assigned aircraft. They identify the specific maintenance and modernization tasks and the estimated hours required to accomplish the work. A typical program would include programmed depot maintenance, which consists of predetermined, cyclical, scheduled maintenance and modernization tasks; periodic inspections; painting; and installing modifications to improve safety, performance, and operational capability. To save money and time, the depot program may also include base-level tasks negotiated between the ALC and operating command to be done concurrently with programmed depot maintenance. ALC and AFLC management review boards review, revise, and approve the annual depot maintenance requirements, and, after further budget reviews, these requirements are submitted in the President's budget.

Determining, validating, and executing requirements is a lengthy process subject to much change. About 3 years elapse between initial identification of a requirement and accomplishment. For example, the depot maintenance requirements for fiscal year 1989 were initially estimated in late 1986 but not completed until October 1989. During this period, programs, priorities, funding, and the factors used to compute requirements may change substantially; thus, the work accomplished may be quite different than earlier estimated.

The Air Force's budget request includes the computed depot maintenance requirements for the upcoming fiscal year plus a carryover of those requirements not funded in the previous fiscal year. The carryover exists when estimated repair requirements exceed available funding, creating an unfunded requirement. To determine how much of the

unfunded requirement is to be included in the next year's budget request, Air Force officials have typically reduced (discounted) the total requirement by about 20 to 50 percent to recognize changed or eliminated requirements. Unfunded requirements may be eliminated because they were overstated, unexecutable (tasks that could not be accomplished at depots because of a lack of production capacity, personnel, parts, or for reasons other than a lack of funding), low priority, or represented lost maintenance opportunities (tasks with maintenance cycles of less than 1 year that will already have been recalculated in next year's requirement). The balance, referred to as the unfunded deferred requirement, is added into the next year's program.

## Projected Funding Shortfalls

Air Force annual budget submissions have usually projected an unfunded requirement, or funding shortfall, which must be considered for elimination or carryover. Shortfalls were rather small and considered manageable until the amended budget submitted in February 1988, which forecasted total depot maintenance funding shortfalls of about \$1,017 million in fiscal year 1988 and \$1,464 million in fiscal year 1989. The largest unfunded requirement shown in the amended budget was for reparable—\$588 million in fiscal year 1988 and \$900 million in fiscal year 1989. The shortfalls in the aircraft maintenance and modernization subactivities were projected to be about \$156 million and \$241 million, respectively, as shown in table 1.1.

Table 1.1: Projected Funding Shortfalls

Dollars in millions

	Fiscal year	
	1988	1989
Estimated requirement	\$789	\$878
Budgeted funding	-633	-637
Projected shortfall	\$156	\$241

In March 1988, the Air Force testified before the Subcommittee on Readiness, House Committee on Armed Services. The Air Force stated that the operating commands were being asked to assume some of the AFLC depot work load and that depot maintenance tasks were being eliminated or deferred because of the funding shortfall in fiscal year 1988.

## Objectives, Scope, and Methodology

Because of concern about the Air Force's management of its depot maintenance work loads, the Chairman, Subcommittee on Readiness, House Committee on Armed Services, requested that we review the AFLC's transfer of aircraft maintenance and modernization tasks from the depots to the operating commands during fiscal years 1988 and 1989 and determine whether these transfers duplicated depot activities, increased costs, and impacted aircraft readiness. As agreed with the Chairman's office, we also reviewed the AFLC's elimination and deferral of aircraft depot maintenance and modernization requirements to determine the significance of these actions in offsetting funding shortfalls.

We focused our review on aircraft maintenance tasks that were transferred from the depots to TAC and MAC in fiscal years 1988 and 1989. We performed our review at the Air Force Headquarters, Washington, D.C.; AFLC Headquarters, Wright-Patterson Air Force Base (AFB), Ohio; Warner Robins Air Logistics Center, Robins AFB, Georgia; Headquarters and 1st Tactical Fighter Wing, TAC, Langley AFB, Virginia; Headquarters and 375th Aeromedical Airlift Wing, MAC, Scott AFB, Illinois; Tyndall AFB, Florida; and Eglin AFB, Florida.

To determine the Air Force's process for transferring depot tasks to operating commands, we reviewed Air Force regulations, policies, procedures, and practices on the identification and transfer of work from depots to operating commands, including (1) processes for shifting work permanently, (2) temporary assistance provided by operating commands on technical orders, programmed depot maintenance, and unscheduled maintenance, and (3) one-time authorizations to accomplish specific depot-level tasks.

During our visits to TAC and MAC, we discussed actions to address depot maintenance funding shortfalls in fiscal year 1988 and identified tasks transferred to TAC and MAC in fiscal years 1988 and 1989. At our request, officials estimated costs and personnel hours expended by operating commands on depot-level tasks; however, available cost data were not complete or sufficient to accurately document the total work load transferred. We did not review actions taken by the Strategic Air Command because its level of effort was less than either TAC or MAC.

To determine whether tasks accomplished at operating bases duplicated depot activities and increased costs, we reviewed the AFLC's and operating commands' efforts to jointly identify tasks to transfer and coordinate depot and base maintenance work loads. We obtained

memorandums of agreement and other documents that defined responsibilities and work processes. We compared transferred tasks with existing depot work loads, reviewed budget documents, and discussed with officials the personnel, facilities, equipment, and supplies required to accomplish this work.

To identify potential effects on readiness, we reviewed Air Force reports on and projections of capability. We identified Air Force assessment systems and reviewed management indicators of logistics support. We also interviewed officials at AFLC, TAC, and MAC to obtain their perspectives on operational experiences and readiness.

To review the extent to which the AFLC eliminated and deferred depot maintenance requirements and how this affected funding shortfalls, we traced the changes in funding and requirements in the aircraft depot maintenance account from initial estimates to execution of the fiscal years 1988 and 1989 programs and reviewed available fiscal year 1990 data. In addition, we tracked specific changes in the F-15 aircraft depot requirements during these fiscal years, focusing on specific maintenance and modernization tasks that had been deferred or eliminated.

We performed our review from May 1989 through January 1990 in accordance with generally accepted government auditing standards. DOD's official comments on a draft of this report are in appendix I.

# Depot Work Load Transferred to Operating Commands

During fiscal years 1988 and 1989, some AFLC depot tasks were transferred to the operating commands. These tasks consisted primarily of installing some modifications, inspecting aircraft, and accomplishing tasks normally done during scheduled depot maintenance. In fiscal year 1988, the work load transferred to the commands was a relatively small portion of the total depot work load. The amount of work transferred to the commands decreased during fiscal year 1989 and is expected to decrease further in fiscal year 1990. We found no evidence that base maintenance efforts duplicated current depot maintenance activities, increased maintenance costs significantly, or had a negative effect on aircraft readiness.

## Tasks Accomplished by Operating Commands

In September 1987, AFLC provided the operating commands with initial estimates of fiscal year 1988 depot maintenance funding. Because of projected funding shortfalls, AFLC asked the commands to (1) set priorities for depot tasks to be done, (2) determine tasks that could be deferred, and (3) identify tasks that bases could accomplish.

In an October 1987 message to AFLC, TAC proposed efforts to help work around the funding shortfall. In addition to identifying tasks that could be eliminated or deferred, TAC identified depot tasks that could be accomplished at operating bases. The message stated that TAC could temporarily absorb some, perhaps a substantial portion, of the depot maintenance work load. Maintenance tasks identified in the message included unscheduled repairs usually done by depot field teams, painting of all aircraft completing programmed depot maintenance, and maintenance and modernization tasks eliminated from depot schedules.

In January 1988 messages to AFLC, officials from MAC and the Strategic Air Command outlined their efforts to assist AFLC and work around the depot funding shortfalls. Their actions emphasized increasing base-level repair of parts and components. The Strategic Air Command stated its intent to maximize use of its resources to maintain readiness of its weapon systems, and MAC stated it was ready to do its fair share to lessen the impact of funding shortfalls.

We found that base maintenance organizations of TAC and MAC did accomplish some maintenance and modernization tasks during fiscal years 1988 and 1989 that AFLC had originally planned to do at its depots and contractor facilities. These tasks included installing modifications, inspecting aircraft, painting, making structural repairs, and performing other tasks normally accomplished during scheduled depot maintenance.

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We did not review actions taken by the Strategic Air Command. However, according to AFLC officials, that Command also accomplished some depot work.

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## TAC's Efforts

With AFLC's concurrence, TAC accomplished some depot level work during fiscal years 1988 and 1989. TAC's principal efforts consisted of the following.

- In January 1988, TAC signed agreements with Warner Robins ALC to establish two regional maintenance facilities at Holloman and Tyndall AFBS to accomplish F-15 modifications and repairs. TAC maintenance personnel assisted depot teams to repair and install modifications. During fiscal year 1988, 76 modifications were installed on 12 aircraft at an estimated cost to TAC of \$344,000.
- At other bases during fiscal year 1988, TAC personnel accomplished 125 modifications on F-15s at an estimated cost of \$210,000. These tasks were considered to be depot level because of the estimated time needed to install modifications.<sup>2</sup>
- Personnel installed modifications on F-16 aircraft at an estimated cost of \$100,000. These tasks were considered base-level efforts but had previously been done at AFLC's depots for expediency.
- TAC took back the responsibility for five field-level tasks on the F-111 aircraft that were previously done during programmed depot maintenance for economic reasons. Officials estimated costs to be about \$63,000 per year.

TAC officials also reported painting F-15, F-16, and F-4 aircraft that AFLC had decided to delay until the next scheduled maintenance. TAC officials estimated it would have cost AFLC depots about \$2.6 million to paint the 82 aircraft affected. Instead, TAC personnel painted some of these aircraft as part of their ongoing painting program, although officials could not tell us exactly how many additional aircraft TAC painted because of AFLC's funding shortfalls. They also explained that their painting effort is not comparable to the depot's because TAC does not have the capability to chemically strip paint off the aircraft.

TAC personnel also increased their assistance to depot field teams performing unscheduled maintenance. TAC officials could not quantify all these efforts because work was commingled with regularly scheduled

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<sup>2</sup>Air Force guidance considers tasks to be depot level if they require more than 25 hours to complete the repair.

base maintenance and separate records were either not kept or were not accurately and consistently reported. The officials did state that, because of TAC's assistance, the depots were able to respond to more requests for maintenance while spending fewer dollars. For example, according to TAC officials, in fiscal year 1987, AFLC spent about \$8.4 million in responding to 443 repair requests from TAC. In fiscal year 1988, AFLC spent \$4.1 million in responding to 524 requests. Actions during these 2 years cannot be directly compared because the work content was likely different, but TAC officials believe depot funds were saved as a result.

TAC officials said their intent in assuming depot work loads was to help AFLC in the short term to work around funding shortfalls. They said that their efforts began in fiscal year 1988, decreased in fiscal year 1989, and should be completed during fiscal year 1990. The regional maintenance facilities were closed in late 1988. No new aircraft maintenance tasks were transferred during fiscal year 1989, and many of the tasks were shifted back to AFLC. They said that with improved depot funding, the depot work load reverted to AFLC where it belonged.

According to TAC officials, they did not want to permanently assume additional work loads because TAC did not have the capability to sustain additional work for an extended period of time. Also, TAC officials said that depot-level activities were not compatible with their primary mission to deploy and fight. TAC, however, would continue doing some tasks that bases were capable of and when it made economic sense to do so. The officials said they would continue doing some inspections and other tasks previously performed by AFLC during programmed depot maintenance and would continue to assist depot field teams to the extent practical.

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## MAC's Efforts

MAC also worked with AFLC to identify and accomplish depot work loads, but, like TAC, these efforts were relatively small and, in some cases, represented a continuance of past practices. MAC officials characterized their primary approach during fiscal years 1988 and 1989 as "business as usual." MAC officials said the Command has historically emphasized accomplishing the maximum maintenance possible at operating bases to save dollars and minimize the downtime caused when aircraft and parts have to be shipped to depots for repair. MAC's responsibility to provide worldwide airlift to defense organizations on a daily basis has resulted in an extensive, very capable network of base maintenance, which has reduced their dependence on AFLC depots. In addition, MAC was not as



directly affected by the depot shortfalls as was TAC because most of MAC's depot maintenance costs are paid for by the Airlift Services Industrial Fund, which was not underfunded.

MAC's principal efforts were to install modifications that were classified as depot-level tasks because of the estimated number of maintenance hours required to do them. MAC officials said they have accomplished similar work loads in the past where capable and when approved by AFLC. The officials cited the following work loads and cost estimates, which in some cases include efforts projected to continue beyond fiscal year 1989.

- MAC is installing the throttle control modification on the C-130 aircraft. MAC will eventually install kits on 238 aircraft at an estimated total cost of \$1.6 million.
- MAC is installing 17 modifications on C-5 aircraft at an estimated total cost of about \$1 million.
- Base maintenance personnel are installing three modifications on the C-141 fleet because of a lack of depot capacity and the funding shortfall. Estimated cost will be about \$370,000.

In addition to installing depot-level modifications, MAC officials also identified 56 tasks on the C-9 aircraft (a military version of a DC-9 used for medical evacuation) that could be done by bases that were previously done during contractor programmed depot maintenance. Eventually, 15 inspections tasks were approved by AFLC to be accomplished by MAC. MAC officials did not estimate the costs to be incurred by base maintenance on these tasks. Also, they said that base personnel assisted depot and contractor field teams during unscheduled maintenance. This is not a new initiative but was reemphasized due to the funding shortfalls. The officials could not provide cost records for these efforts because work was typically accomplished in conjunction with normal base maintenance activities and reported as part of the total hours expended.

MAC officials also reported that AFLC had extended the time intervals for programmed depot maintenance on the C-5, C-9, C-130, and C-141 aircraft during fiscal years 1988 and 1989. Intervals were extended from 48 to 60 months because AFLC officials decided that the time period between scheduled maintenance could be lengthened without degrading safety or operability. According to MAC officials, the decisions to extend intervals were not made to accommodate the funding shortfalls but will result in decreased annual programmed depot maintenance costs.

## Effects of Transferred Work Loads

AFLC's transferring of maintenance tasks to the operating commands did not substantially duplicate current depot activities or significantly increase maintenance costs. These efforts also helped maintain aircraft readiness by allowing the Logistics Command to target depot funds on high-priority tasks.

AFLC officials could not quantify or fully identify the total cost of the depot tasks accomplished at operating bases during fiscal years 1988 and 1989. AFLC requested the operating commands to provide cost data in February 1988. AFLC said that quantifying these efforts was extremely important if depot maintenance budget requests were to retain credibility and asked the operating commands to estimate their impacts on fiscal years 1988 and 1989 depot requirements. According to AFLC officials, the operating commands never adequately complied with their request. Consequently, AFLC did not know the full cost of depot work load accomplished by operating commands during fiscal years 1988 and 1989. MAC replied that it was extremely difficult to quantify depot requirements and projecting requirements based on temporary efforts by MAC would only perpetuate the budget impact.

TAC and MAC officials could not completely identify and quantify the additional work load shifted due to funding shortfalls because (1) much of the work had been accomplished in conjunction with their normal base maintenance work loads and separate records were not always kept or were incomplete and (2) it was difficult to distinguish some additional transferred work loads from similar work undertaken by bases in the past. Also, some tasks are classified as base-level work but have frequently been accomplished at depots for reasons of economy and efficiency. Each year, AFLC and the operating commands negotiate whether to include such work as part of the scheduled maintenance work package.

We found no evidence that the tasks transferred to TAC and MAC substantially duplicated AFLC depot activities. Officials from the three operating commands coordinated their efforts and jointly determined tasks to be transferred. In most cases, TAC and MAC maintenance personnel either supplemented depot personnel or accomplished tasks that AFLC had eliminated or deferred to subsequent years. For example, TAC personnel augmented an existing depot work force and accomplished work at the regional maintenance facilities that had previously been done by AFLC personnel.

TAC and MAC also assisted to a greater extent in performing unscheduled maintenance work, thereby reducing AFLC's level of involvement. TAC and MAC also performed other tasks normally accomplished during depot maintenance, which AFLC had eliminated or delayed, including installing modifications, painting, and inspecting aircraft.

Based on available information and officials' statements, accomplishing some maintenance work at operating bases instead of depots did not significantly increase total maintenance costs. TAC and MAC officials said they were able to do depot tasks without requiring additional base maintenance personnel, equipment, and facilities. They also said that base supplies were sometimes used in the completion of depot work. They could not identify such expenses in their cost records, but the additional expenditures were considered small.

In its March 1988 testimony, the Air Force explained that the operating commands' ability to assume additional depot work loads was based on the military work force at their disposal, which is sized for a wartime mission and has unused capacity. Therefore, base maintenance organizations are able to expand peacetime operations—at least for a period of time—with existing resources. Air Force officials said that the logistics system has a substantial degree of “elasticity,” which gives the Air Force flexibility in reacting to and coping with changes in depot maintenance funding and work load. The officials also said, however, that continued shortfalls could strain the system.

Air Force officials claimed some cost savings by doing the work at operating bases. These savings, however, are difficult to verify because of the lack of adequate cost data. In addition, the standard hourly rates charged by depot and base personnel cannot be directly compared because rates are based on different cost factors and assumptions.

According to Air Force officials, the actions taken to offset funding shortfalls helped maintain readiness and daily operations at required levels. The officials said their actions allowed AFLC to target funding on high-priority tasks. Each operating command performed work that it felt was needed, which allowed it to keep aircraft available and on-station. For example, some of the modifications installed by TAC and MAC were to bring aircraft to comparable configurations and to improve operations.

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## **Conclusions**

When faced with depot funding shortfalls, operating commands were able to accomplish tasks with existing resources usually done by the AFLC depots. Operating bases appear to be able to effectively perform additional work in certain cases where adequate and capable resources are available. We believe that the Air Force can continue to accomplish some depot-level maintenance tasks at the operating bases. Decisions as to the appropriate maintenance level for specific tasks should not be driven by funding but rather by economy, efficiency, and readiness factors.

# Requirements for Maintenance and Modernization Tasks Reduced

In response to funding shortfalls in fiscal years 1988 and 1989 depot maintenance funding, Air Force officials prioritized the depot work load and allocated funds to support peacetime operations and maintain readiness. In addition to transferring some tasks to the operating commands, Air Force officials eliminated or deferred maintenance tasks that were not executable (overstated), essential, or safety related. These actions substantially reduced the size of the shortfalls from earlier budget projections while maintaining readiness and daily operations at required levels. This raises questions about the need for and relative importance of some requirements in the budget and the resultant projected shortfalls. The Congress, in both fiscal years 1989 and 1990, provided additional funding for depot maintenance because of projected funding shortfalls.

## Overstated Requirements in Amended Budget Eliminated

Air Force officials eliminated requirements that had been overstated in the amended fiscal years 1988/1989 budget submission. The officials said that total depot maintenance requirements in the amended budget included unexecutable tasks that could not be accomplished by the depots during the program years because of a lack of production capacity, parts, personnel, or for reasons other than a lack of funding. This overstated the work load that the depots could realistically accomplish and consequently overstated funding shortfalls.

For the fiscal year 1988 aircraft program, AFLC's system identified requirements of about \$706 million in June 1988, a decrease of about \$83 million from about \$789 million shown in the amended budget in February 1988. Fiscal year 1989 aircraft maintenance requirements decreased from about \$878 million, the amount in the budget, to about \$810 million in the June 1988 management review, and to about \$720 million tabulated by AFLC's system in May 1989—a total decrease of about \$158 million. Air Force officials attributed much of the decreases to the elimination of unexecutable requirements. The officials also said that changes in the program, changes in the factors used to compute requirements, and unforeseen events such as contracting delays likely contributed to the decline in requirements.

Our report<sup>3</sup> on Air Force depot maintenance backlogs similarly showed that the funding shortfalls originally projected in the amended budget

<sup>3</sup>Depot Maintenance: Air Force Defines Backlog Better, but Additional Efforts Are Needed (GAO/NSIAD-89-211, Sept. 26, 1989).

for the entire depot maintenance and modernization program were significantly reduced. This occurred when unexecutable requirements were eliminated and the Air Force re-estimated annual requirements based on (1) the actual work accomplished during the year and (2) a more accurate measure of the valid unfunded work load to be deferred.

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## AFLC Eliminated and Deferred Maintenance Tasks

Because of the projected funding shortfalls, AFLC officials prioritized the depot maintenance work load and allocated funds to support peacetime operations and maintain readiness. (See ch. 2.) In an October 1, 1987, letter and in subsequent correspondence, AFLC officials asked the ALCS to review repair requirements and determine those that could be eliminated or deferred. The ALCS were asked to eliminate or defer aircraft tasks that were not essential or safety related. AFLC provided funding so that aircraft would not be grounded due to a failure to perform programmed depot maintenance. Also, AFLC officials wanted to complete the flying hour program as planned. AFLC's primary goal was to maintain readiness by supporting peacetime operations.

AFLC used the ALCS' information to prioritize repairs and develop a strategy for allocating funds. To reduce fiscal year 1988 aircraft requirements, AFLC

- eliminated some inspections and paintings, except for severe corrosion control;
- eliminated tasks from scheduled depot maintenance that were not safety related and others that had been added to the program for economical reasons;
- extended time intervals for some programmed depot maintenance;
- left unfunded the estimated costs to repair damaged aircraft; and
- deferred the installation of nonsafety-related modifications and those where needed modification kits were not available because of procurements or delivery delays.

AFLC eliminated and deferred requirements totaling about \$88 million by these actions from June 1988 when the requirement was estimated at about \$706 million to September 1988 when funded requirements totaled about \$618 million. Table 3.1 shows the eliminations of about \$60 million and deferrals of about \$28 million made in fiscal year 1988 by type of requirement.

**Table 3.1: Eliminated and Deferred Requirements**

Dollars in millions		
Type of requirement	Eliminated	Deferred
Programmed maintenance	\$26.2	\$18.0
Scheduled tasks	13.3	0.4
Painting	10.9	0.4
Modifications	5.3	4.9
Inspections	3.8	0.0
Damage repair/other	0.4	4.2
<b>Total</b>	<b>\$59.9</b>	<b>\$27.9</b>

Some of these tasks were accomplished by the operating commands. AFLC officials determined that the others were not needed or could wait until the next scheduled maintenance without affecting the mission or safety.

AFLC adopted much the same set of priorities and funding strategy in accomplishing the fiscal year 1989 program. AFLC officials eliminated about \$63 million during fiscal year 1989, including projected repairs of damaged aircraft, installation of modifications, and painting. For example, AFLC included a requirement in the budget of \$22.6 million for projected aircraft damage repair, including deferred requirements carried over from fiscal year 1988. During fiscal year 1989, AFLC officials expended only \$8.8 million and eliminated the remaining amount. At the end of the fiscal year, AFLC officials said that there were no unfunded deferred requirements to be carried over to fiscal year 1990.

According to AFLC officials, fiscal year 1989 funding problems were not as severe as during fiscal year 1988 because of improved funding. The Congress provided additional funding for the depot maintenance program, some of which was allocated to aircraft tasks. The officials also said improved funding allowed them to adequately meet current needs while working off some of the deferred work from fiscal year 1988.

**F-15 Tasks Eliminated or Deferred**

Actions taken by the F-15 program office exemplify AFLC-wide efforts to eliminate or defer maintenance tasks. Major eliminations made by the F-15 program office in fiscal year 1988 included painting 23 aircraft, conducting 55 repair tasks from scheduled maintenance, and inspecting 9 aircraft. These tasks would have cost \$2.2 million. Officials also rescheduled about \$7 million of modifications to subsequent years, deleted a \$3.1 million contingency fund for projected aircraft damage

repair, and made other changes to the maintenance program. These eliminations and deferrals plus other additions and reductions decreased the total fiscal year 1988 maintenance requirements for the F-15 from \$86 million in June 1987 (the estimate used to prepare the amended budget) to \$73.9 million in August 1988 (near completion of the fiscal year).

In the F-15's fiscal year 1989 program, a delay in acquiring modification kits reduced planned installation costs by \$17.9 million. An F-15 official said that contract or slippage in developing, testing, and approving the kit delayed deliveries and consequently slipped the planned installation schedule. The number of aircraft scheduled for programmed depot maintenance also decreased from 100 to 78 due to capacity constraints, which reduced depot requirements another \$11.1 million. Warner Robins ALC officials said the lack of capacity was due to the fiscal year 1988 funding shortfalls, which had prohibited them from adding maintenance personnel. The F-15's fiscal year 1989 requirements decreased from \$108.7 million to \$89.7 million between March 1988 and July 1989 estimates. As in fiscal year 1988, other program additions and reductions resulted in the net decrease.

According to F-15 program officials, the funding shortfall was not the only reason for the decreases in total requirements. Between earlier estimates and completion of work, some new requirements were added and others reduced for reasons not directly related to funding. For example, the original fiscal year 1989 depot program for the F-15 aircraft shown in the January 1987 budget submission did not include a programmed depot maintenance schedule because the F-15 had been designed to be field maintained. The Air Force subsequently decided to initiate a programmed depot maintenance program in fiscal year 1989 because repairs and unprogrammed maintenance had increased beyond the field's capacity and required depot capability. The new programmed depot maintenance requirements were recognized in the February 1988 amended budget submission, and other repairs shown in the earlier budget were reduced.

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## **Shortfalls Significantly Reduced and Readiness Maintained**

After eliminating unexecutable, nonessential, and low-priority maintenance tasks, the aircraft requirements for fiscal years 1988 and 1989 were significantly reduced from estimates shown in the amended budget request. At completion of the depot maintenance programs, the actual funding shortfalls for fiscal year 1988—as measured by the unfunded deferred requirements—were only \$28 million. However, for fiscal year



**Chapter 3  
Requirements for Maintenance and  
Modernization Tasks Reduced**

1989, the actual funding shortfalls were reduced to zero. This contrasted with the much larger shortfalls projected in the amended budget—\$156 million in fiscal year 1988 and \$241 million in fiscal year 1989. (See table 1.1.) Although changes in budget guidance and definitions made since the amended budget was submitted preclude direct comparisons between actual and projected amounts, Air Force actions did substantially reduce budgeted requirements and the unfunded amounts to be carried over to subsequent years. Table 3.2 shows the aircraft maintenance requirements accomplished during fiscal years 1988 and 1989.

**Table 3.2: Funding Shortfalls**

	Fiscal year	
	1988	1989
Ending requirement	\$646	\$657
Funded	-618	-657
Funding shortfall	\$28	\$0

The ending requirement reflects the eliminations made by Air Force officials during program execution and represents work funded plus the computed unfunded work still considered valid and to be deferred to subsequent budgets. The reduced carryover of deferred requirements for fiscal years 1988 and 1989 consequently reduced fiscal years 1989 and 1990 requirements from the initial projections shown in budget submissions. Funded amounts reflect (1) additional funds appropriated by the Congress in fiscal year 1989 and (2) Air Force funding adjustments, including redirection of funds to other accounts. The Congress added funding to the total depot maintenance account in fiscal year 1989 (\$63.8 million) and in fiscal year 1990 (\$50 million) because of the Air Force's projected funding shortfall.

Despite the significant reductions in the fiscal years 1988 and 1989 aircraft programs, AFLC still provided an adequate level of depot support and helped the Air Force maintain high-readiness levels compared to prior years. AFLC's funding strategy had protected basic aircraft programs and had eliminated or deferred low-priority and noncritical tasks. Officials at AFLC, TAC, and MAC expressed general satisfaction with the level of depot support accorded aircraft. They said that high-priority, mission-essential, and safety-related tasks had been accomplished. In addition, aircraft had not been grounded due to a failure to perform scheduled maintenance. The officials also said their actions to eliminate unexecutable and lower priority work loads and defer other tasks

helped maintain readiness and daily operations at required levels despite the funding shortfalls.

According to figures supplied by the Air Force, mission capable rates (the percent of available aircraft capable of performing their mission) remained high and fairly steady during fiscal years 1988 and 1989, continuing the improvement shown throughout the 1980s. The mission capable rate for the total Air Force was 81.1 percent in fiscal year 1988. The rate declined slightly to 79.6 percent in fiscal year 1989 but was still high compared to prior years. The rate was 66.2 percent in fiscal year 1980. For TAC's operational fighters, the mission capable rate was 88.2 percent in fiscal year 1988, an all-time high. Through the end of the third quarter, the rate for fiscal year 1989 was 87.8 percent. In fiscal year 1980, the mission capable rate for TAC's operational fighters was 59.1 percent.

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## **Efforts to Improve Requirements Estimates and Budget Submissions**

The Office of the Secretary of Defense and the Air Force have efforts underway to improve requirements estimates and budget submissions. These efforts include providing new planning instructions and budget guidance to make reporting formats more consistent and informative and recommending improved procedures for estimating executable requirements and unfunded deferred requirements. Current budget guidance prescribes that only executable requirements not accomplished because of a lack of funds can be considered for deferral to next year's budget.

The Air Force is also studying why total depot requirements typically decline from initial budget estimates to execution. Several studies have shown, and Air Force officials acknowledge, that the depot maintenance program actually accomplished is usually smaller than planned. As the program moves closer to execution, forecasts are refined to better reflect changed conditions and a more realistic level of executable requirements. For example, Air Force officials successively reduced the estimated fiscal year 1988 requirement (not including amounts deferred from fiscal year 1987) for aircraft damage repair from \$30.5 million to \$21.5 million to \$15 million to better reflect decreased accident rates experienced in recent years. In addition, as discussed in this report, the officials can eliminate overstated, low-priority, and unexecutable requirements and defer other tasks to the next year. Deferred requirements can include both planned tasks that could not be accomplished in the budgeted year and other tasks that the officials determined could be delayed without significant impact.

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## **Conclusions**

We believe that the Air Force's budget has enough flexibility to enable its officials to eliminate some aircraft maintenance requirements and defer accomplishing others for a year or more with little impact on aircraft readiness. As a result of these eliminations and deferrals, the severe funding shortfalls projected for fiscal years 1988 and 1989 aircraft depot maintenance and modernization programs did not occur. This raises questions about the validity of some of the requirements and projected shortfalls presented in budget submissions. DOD and the Air Force have efforts underway to improve requirements determinations and budget submissions to the Congress, which are intended to present more appropriate funding levels for depot maintenance activities.



# Comments From the Assistant Secretary of Defense for Production and Logistics



PRODUCTION AND  
LOGISTICS

ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, D.C. 20301-8000

May 17, 1990

(L/MD)

Mr. Frank C. Conahan  
Assistant Comptroller General  
National Security and  
International Affairs Division  
U.S. General Accounting Office  
Washington, DC 20548

Dear Mr. Conahan:

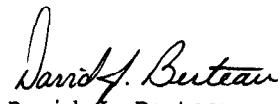
This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "AIRCRAFT MAINTENANCE: Air Force Transferred and Eliminated Tasks to Address Funding Shortfalls," dated April 5, 1990 (GAO Code 392496), OSD Case 8293.

The DoD has reviewed the report and concurs with the report's findings. It should be noted that it is not just Air Force policy to accomplish maintenance at the lowest level where cost effective. This DoD policy is applicable to all four Military Services and is contained in DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel." In addition, the Department fully agrees with the GAO that accomplishing some depot maintenance tasks at the operating bases is feasible, cost effective, and contributes to improved readiness.

The Department will continue to pursue efforts underway to improve depot maintenance requirements determinations as identified in the report and will monitor progress on those actions.

The Department appreciates the opportunity to review the report in draft form.

Sincerely,

  
David J. Berteau  
Principal Deputy

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