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Report to the Ranking Minority Member, Committee on Governmental Affairs, U.S. Senate

December 1987

DEPOT MAINTENANCE

Problems in Procuring Helicopter Parts Result in Shortages and Added Costs

GAO/GGD-88-20

GAO

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

General Government Division

B-226931

December 17, 1987

Honorable William V. Roth, Jr.
Ranking Minority Member
Committee on Governmental Affairs
United States Senate

Dear Senator Roth:

This report responds to your September 12, 1986, request on the impact of, and circumstances surrounding, repair parts shortages at the Corpus Christi Army Depot, and describes actions that the Army is taking to overcome the shortages. The Corpus Christi, Texas, depot overhauls most Army helicopters, engines, and components, such as transmissions, rotor hubs, and blades.

Repair parts shortages have been increasing at the depot causing significant maintenance cost increases and reductions of available aircraft. Contributing to the parts shortages were lengthy procurement processing delays and increasing numbers of defective parts received from contractors. In fiscal year 1984, the depot experienced 86 shortages for the year affecting 1 of every 16 overhaul programs. In 1985, 195 shortages for the year affected one of every five programs. For the month of January 1987, the depot was averaging 393 parts shortages, affecting over half of the depot's 500 to 600 programs. A major factor contributing to the shortages was that the Army had not exercised effective management over the procurement process to ensure that parts were ordered, manufactured, or delivered to the depot when needed. This lack of effective oversight became significant beginning in 1983 when increased emphasis on competition added new steps to the procurement process and increased the time required to award contracts.

The growing repair parts shortages at the depot increased the labor cost of overhauling helicopters, engines, and components, because the depot had to resort to costly, inefficient actions to work around parts shortages such as repairing rather than replacing worn parts. For example, depot officials estimated that labor costs increased by about 15 percent or $24 million in fiscal year 1985.

Adding to the depot's problem, which also was an Army-wide problem, was defective parts received from contractors. A primary tool the Army uses to eliminate or reduce defective parts is to inspect the operations of high-risk contractors—first time producers, and those who produce technically complex parts or parts critical to flight safety. An estimated

80 percent of these inspections identify significant quality defects. But in fiscal year 1985, of the 844 inspections the U.S. Army Aviation Systems Command (AVSCOM) believed necessary only 210 were actually made, and only 128 of 700 such inspections were made in fiscal year 1986, due to lack of staffing and travel funds.

Thus, parts shortages and defective parts decreased the number of overhauled engines and components available to support Army aviation units because the depot reduced or stopped its output until parts became available again. This grounded hundreds of Army helicopters and, according to Army officials, degraded Army readiness.

AVSCOM, a major subordinate command of the U.S. Army Materiel Command (AMC), is responsible for contracting for repair parts and ensuring that they are available at the depot when needed. We found that AVSCOM did not have an effective internal management control system to alert it when repair parts had not been contracted for in a timely manner or when the parts would not be manufactured or delivered when expected. Consequently, AVSCOM generally was unaware of procurement delays and other problems and therefore, could not take corrective actions to prevent shortages. In addition, AVSCOM did not make all of the high risk contracts inspections required because of limited staffing and travel funds.

Although our review was done at the Corpus Christi Army Depot, AMC officials said that repair parts shortages are a major problem at the other seven maintenance depots as well. AMC officials estimate that Army-wide repair parts shortages increased labor costs by between 10 to 15 percent, or $75 to $112 million in fiscal year 1985. In addition, these officials believe opportunities for productivity improvements of about 2 percent a year were lost at all Army maintenance depots because of the disruptions caused by parts shortages. Moreover, AMC officials told us that the management control and perhaps the quality assurance weaknesses we identified at AVSCOM exist to varying degrees throughout AMC.

The Army has planned or taken some actions to improve its management control and oversight of the procurement process by tracking procurements and alerting managers when delays occur and establishing standards for how long procurement steps should take. AVSCOM's top management should be able to intervene and make critical decisions that should reduce the severity of parts shortages. We could not determine whether these changes are resolving parts shortages because they were either planned or recently put into effect. However, because corrective

actions have been taken or are planned, we are making no recommendations in this report.

In his letter dated October 1, 1987, the Assistant Secretary of Defense for Production and Logistics stated that DOD generally agrees with the report (see app. III). He noted that action had been taken on many of the problems but that additional attention will be required by the Army over the next several months.

We did our work at the Corpus Christi Depot. It is the Army's largest depot and accounts for about 20 percent of its maintenance costs. We also did work at AVSCOM, which is responsible for managing the helicopter fleet and for buying and ensuring that repair parts are available on time. We reviewed policies, procedures, and practices for depot overhaul, workload scheduling, and parts purchasing. Generally, where estimates were used, we did sufficient testing to assure ourselves that they were reasonable. Our work was done between February 1985 and January 1987 and was performed in accordance with generally accepted government auditing standards.

A more detailed discussion of our objectives, scope, and methodology appears in appendix I, and appendix II contains a more detailed discussion of our findings.

As arranged with your office, we will send copies of this report, 15 days after its issue date, to the Secretaries of Defense and Army; the Director, Office of Management and Budget; and other interested parties.

Sincerely yours,

Gene L. Dodaro

Gene L. Dodaro
Associate Director

Contents

Abbreviations

AMC	U.S. Army Materiel Command
AVSCOM	U.S. Army Aviation Systems Command
CICA	Competition in Contracting Act
DESCOM	Depot System Command
DCAS	Defense Contract Audit Service
DLA	Defense Logistics Agency
DOD	Department of Defense
PRPG	Procurement Review Planning Group

Objectives, Scope, and Methodology

We were asked to (1) report on the impact that repair parts shortages had on helicopter, engine, and component overhaul productivity at Corpus Christi Army Depot; (2) identify problems and circumstances surrounding the shortages; and (3) determine what the Army is doing to overcome these shortages.

We did our work at Corpus Christi Army Depot, the largest of the Army's eight major maintenance depots. In fiscal year 1985, this depot accounted for about 20 percent of the Army's total expenditures on depot maintenance. We also did audit work at the U.S. Army Aviation System Command (AVSCOM) because this command was responsible for managing the Army's helicopter fleet and for ensuring that repair parts were available at the depot when needed.

We reviewed Army policies, procedures, and practices for depot level helicopter overhaul and repair. We interviewed officials at the depot, AVSCOM, Depot System Command (DESCOM), and U.S. Army Materiel Command (AMC) to obtain information on any problems these and other AMC major subordinate commands were having procuring sufficient quality repair parts for the depot and other Army maintenance depots. We also reviewed and took into account two studies by AVSCOM dealing with weaknesses in management control over the administrative procurement process and with the impact of parts shortages on Army readiness of the UH-1 helicopter fleet.

At the depot we identified and documented examples of increased depot overhaul labor costs for helicopters, engines, and components caused by working around repair parts shortages. To do this, we analyzed 18 specific repair parts shortages affecting 10 major depot overhaul programs. These 18 shortages, according to depot officials, were representative of the depot's most serious repair parts shortages at the time of our review. At AVSCOM, we examined records and documents for these 18 repair parts to identify what problems had caused the shortages. For each of the problems identified, we examined further records and documents and discussed them with AMC and AVSCOM officials to determine whether the problems were general or restricted to the 18 parts. We did not visit any of the other Army commands or government agencies responsible for procuring repair parts.

While we were able to document some examples of increased labor costs caused by working around shortages, the depot did not have the information for us to determine its total increased labor costs. Consequently,

we asked Army officials to estimate the percent of the depot's overhaul labor hours used to work around parts shortages.

To test whether their estimate was reasonable, we analyzed seven depot overhaul programs, accounting for 21 percent of its fiscal year 1985 program labor budget. We determined the changes in labor costs for these programs between fiscal years 1983 and 1985. We then asked program managers to identify what percentage of these changes were caused by working around parts shortages.

Parts Shortages Cost Helicopter Depot Millions and Reduce Aircraft Availability

Background

The Army has about 8,400 helicopters located at bases worldwide that play a vital role in the Army's modern warfare capabilities. Army helicopters are classified into four types: utility, observation, attack, and cargo with the first two types the most common. It is critical that these helicopters and associated engines and components are overhauled in a timely and efficient manner to maintain readiness at the least possible cost.

Most overhauls, major repairs, and other scheduled maintenance on Army helicopters are done at Corpus Christi Army Depot. The depot is government owned and operated. It employed about 4,400 civilians in fiscal year 1986, with an operating budget of $266 million. The depot annually overhauls about 400 helicopters, about 1,500 helicopter engines, and over 80,000 components, such as transmissions, rotor hubs, and blades. In all, the depot performs this work through 500 to 600 different maintenance programs carried out during the course of a typical year. Each type of component, engine, or helicopter, for example, would be classified as a program.

AVSCOM is responsible for worldwide inventory management, procurement, determining the number of helicopters, engines, and components that the depot will overhaul each year, and forecasting the number of repair parts necessary to support those overhaul programs. In addition, AVSCOM is responsible for ensuring that all the parts are available at the depot when needed.

DESCOM controls funding and workload scheduling for the Army's eight major maintenance depots. Both DESCOM and AVSCOM are major subordinate commands of AMC, which manages the Army's wholesale supply and maintenance system worldwide.

Parts Shortages Increased Overhaul Labor Costs and Reduced Depot Output

A typical helicopter has about 13,000 different parts, any number of which may need to be replaced during overhaul. Having these parts available at the depot on time and in sufficient quantities is crucial to the efficient and productive overhaul of helicopters, engines, and components.

In recent years, the depot has experienced growing shortages of repair parts, increasingly affecting the 500 to 600 maintenance programs carried out each year. For example, in fiscal year 1984, the depot experienced a yearly total of 86 repair parts shortages, affecting 1 of every 16 overhaul programs. In fiscal year 1985, 195 annual shortages

affected one of every five programs. For the month of January 1987, an average of 393 shortages affected over half of the depot's programs—sometimes affecting as many as 85 percent according to depot estimates.

Parts Shortages Increased Overhaul Labor Costs

Repair parts shortages increased labor costs because the depot worked around them whenever possible rather than stop overhaul programs. Working around shortages added extra steps to the overhaul. Depot officials estimated that at least 15 percent of the depot's overhaul labor hours were used to work around shortages. In fiscal year 1985, 15 percent of the depot's overhaul labor hours was about 677,000 hours or $24 million at fiscal year 1985 labor rates. To test the depot's estimate, we analyzed seven overhaul programs which accounted for 21 percent of the fiscal year 1985 depot's labor budget and found that the depot spent nearly 18 percent of the labor hours for these programs working around parts shortages. This was about $6.5 million in additional labor costs which the depot would not have spent if new parts had been available.

The most commonly used work around procedure was repairing worn parts that normally are thrown away rather than repaired. The depot usually obtained the worn parts by removing them from helicopters, engines, and components awaiting or undergoing overhaul. Depot maintenance officials estimated that it repaired worn parts in about 60 percent of the depot's fiscal year 1985 overhaul programs. Again as a test, we reviewed 10 overhaul programs from that fiscal year and found worn parts were repaired in all 10.

Before the depot could repair worn parts, it had to remove and evaluate them to determine their usefulness. This involved several labor-intensive steps. In the UH-1 transmission overhaul program, for example, depot managers estimated that about 7,800 labor hours were used in fiscal year 1985, or about $240,000, disassembling transmissions awaiting overhaul; removing and evaluating worn parts; and reassembling and storing the transmissions until they were scheduled for overhaul.

After determining that worn parts were usable, the depot had to repair them. These repairs ranged from cleaning and plating or painting, to adding new metal to worn surfaces and remilling them to required tolerances. The labor cost of making these repairs was high. For example, in 1985, the depot repaired 36 fuel cell panels, at a cost of $2,000 each. At that time, the price of a new UH-1 fuel cell panel was $1,152. In this example, repairing worn parts increased the cost to the Army of overhauling UH-1 helicopters by $30,528.

At times, worn parts required such extensive repairs that depot officials had to obtain authorization from AVSCOM. AVSCOM granted such authorizations only after extensive testing to determine whether repairing these worn out parts would endanger aircraft safety. Depot maintenance officials estimated that the depot made extensive repairs in 10 percent of its fiscal year 1985 overhaul programs, including all engine overhaul programs.

The labor cost of making these extensive repairs was high. In 1985, the depot repaired 72 previously scrapped UH-1 tailboom fittings at an average cost of $1,005. At that time, the purchase price for new tailboom fittings was $352 each. Thus in this example, working around one parts shortage increased the cost to the Army of overhauling UH-1 helicopters by over $47,000.

When it was not possible to repair worn parts, the depot sometimes manufactured them from raw materials. The cost of labor, raw materials, and special tooling, and the small quantities produced, escalated the cost of manufacturing parts at the depot. For example, the depot spent $139,257 in labor, materials, and special tooling to manufacture 2,200 UH-1 bushings, compared to the $18,000 it would cost to purchase new ones. Overall, the depot spent roughly $808,000 in fiscal year 1985 to manufacture about 138 different parts that should have been available through the supply system.

In addition to forcing the depot to resort to work around procedures, parts shortages also reduced the opportunities for the depot to improve its productivity from year-to-year. According to depot officials, the constant disruption in depot operations caused by working around increasing numbers of repair parts shortages prevented depot managers from making systematic improvements in overhaul processes and procedures.

Parts Shortages Also Reduced Depot Output

When the depot was unable to work around shortages, it reduced or stopped its monthly output of overhauled engines and components until parts became available again. Output also fell because working around shortages diverted workers from their primary duties of overhauling engines and components.

Our review of 10 fiscal year 1985 overhaul programs showed that the depot reduced monthly output of all 10 programs and stopped overhaul completely for more than a month in 4 of 10 because of repair parts

shortages. In addition, the depot completed only 1 of these 10 programs on schedule.

As depot output fell or stopped, the number of overhauled engines and components available to field units also fell. This grounded hundreds of Army helicopters and, according to Army officials, degraded Army readiness. The following examples illustrate the adverse effects of parts shortages:

- The depot reduced its output of UH-1 helicopter main rotor hubs to 40 units per month in late 1985, far less than the 130 units per month required to support Army's stated needs. Eventually, this shortage grounded 170 helicopters, about 5 percent of the Army's UH-1 fleet.
- Main rotor hub shortages severely affected the Army's helicopter pilot and flight crew training program at Fort Rucker, Alabama. In June 1986, 22 helicopters at Fort Rucker were grounded due to a lack of main rotor hubs.
- The depot stopped overhauling T-63 engines from December 1985 to March 1986. As a result, by April 1986, the Army had no overhauled T-63 engines in inventory, but had unfilled requisitions for 130 engines and 792 unserviceable engines awaiting overhaul at the depot. At that time, 79 OH-58 helicopters were grounded for lack of T-63 engines.

The adverse effects of such shortages on Army readiness was further evidenced in a 1986 AVSCOM study which concluded that the overall supply posture of the UH-1 helicopter fleet was deteriorating, reducing its operational readiness by decreasing the number of mission-capable helicopters. During the 18-month period covered by the study, an average of 29 percent of the Army's UH-1 helicopters, or about 950 of 3,300 aircraft, were grounded primarily for lack of overhauled components.

Department of Defense (DOD) Comments

DOD agreed that the lack of Army helicopter parts increased labor costs and that when the depot could not work around parts shortages, the situation contributed to reduced output.

AVSCOM Did Not Provide Quality Parts When Needed

A major factor contributing to repair parts shortages at the depot was that AVSCOM had not exercised effective management over the procurement process to ensure that parts were ordered, manufactured, or delivered to the depot when needed. Also, when the parts were delivered they were sometimes defective because, in part, AVSCOM did not make all

of the required inspections to assure that contractors manufactured quality parts.

AVSCOM Lacked an Effective Management Control System

We found that AVSCOM did not have a management control system to track parts procurements or to ensure that parts were available at the depot when needed, and it had not set standards for how long individual steps in the procurement process should take. As a result, AVSCOM generally was unaware of delays and other problems and could not take action to avoid shortages.

When purchasing parts, a series of administrative steps takes place after inventory parts managers identify the need to buy parts. These steps are done in sequence by different AVSCOM offices. When delays occur in any step, all subsequent steps are adversely affected. Knowing where and when delays occur is necessary if timely remedial action is to be taken.

At AVSCOM, the status of a procurement action, once entered into the process, could not be readily determined. To locate a procurement action, it was necessary to retrace the action through each step until it could be found.

The absence of top management oversight became a significant barrier beginning in 1983. Until 1983, AVSCOM had relied heavily on a limited number of prime contractors and subcontractors to supply repair parts for Army helicopters, engines, and components typically without competition. Because of highly publicized problems with overpricing of spare parts, DOD undertook a series of corrective efforts to overcome these problems. For AVSCOM, these efforts to increase competition and reduce prices added new steps to the procurement process and increased the time required to process procurements and award contracts. For example, most AVSCOM procurements experienced substantial delays in fiscal year 1985, with large backlogs of work in both engineering and procurement offices. These delays substantially increased the time required to procure parts. Between fiscal years 1984 and 1985, AVSCOM experienced a 68 percent increase in uncompleted procurement actions of more than 180 days old. Similarly, the average time from initiating a purchase request to contract award, known as administrative lead time, had grown from about 100 days in fiscal year 1983 to over 400 days in fiscal year 1986.

AVSCOM has had difficulty adjusting to the new procurement environment. AVSCOM management was not effective in anticipating the impact or in identifying items that should have been procured on an expedited basis to avoid harm to the government. Under the Federal Acquisition Regulation, when the agency's need for supplies or services is of such unusual and compelling urgency that the government would be seriously injured, exemption from competitive requirements is permitted. We reviewed in detail the events surrounding 18 depot repair parts shortages and found that many occurred because the parts procurements were delayed for months in different offices. In some cases, to avoid pricing abuses, procurements were passed repeatedly between different offices because these offices disagreed as to whether processing requirements had been satisfied. In other cases, procurements were delayed because office goals, such as obligating funds or competing more contracts, took priority over providing parts to the depot on time.

Without an effective management control system, AVSCOM management did not have information it needed to show which procurements were delayed, where they were delayed, and why they were delayed, and consequently could not act effectively. As delays increased at AVSCOM, shortages increased at the depot, cascading into more inefficient workaround activity there.

In December 1985 a Procurement Review Planning Group (PRPG) formed by AVSCOM also noted these weaknesses in AVSCOM's management control system. The PRPG study report concluded that deviations, shortfalls, and delays within the acquisition process were not readily detectable and that this lack of information had contributed to the command's inability to support the depot with repair parts.

DOD Comments

DOD agreed that AVSCOM lacked an effective management control system for the procurement of spare parts. DOD said that PRPG had made recommendations to address the problem and that these recommendations, spanning the full gamut of the acquisition process, have all been implemented. Implementation should enable AVSCOM to identify and address the problems noted.

DOD also agreed that competition initiatives played a major role in the shortages. For example, DOD said that implementing the Competition in Contracting Act (CICA), spare parts breakout, reducing unpriced contractual actions, and having too few personnel resources, increased AVSCOM's procurement acquisition lead time. DOD said that implementation of CICA

had a greater effect on AVSCOM because it had the highest percentage of noncompetitive procurements of any Army command.

AVSCOM Did Not Assure All Parts Met Contract Quality Requirements

AVSCOM also is responsible for assuring that repair parts meet quality requirements. For most contracts, AVSCOM relies on the Defense Contract Audit Service (DCAS), under the direction of the Defense Logistics Agency (DLA), to inspect contractor operations and products. However, under Federal Acquisition, Department of Defense, and Army regulations, AVSCOM is required to inspect operations and products for contracts which involve abnormally high risk of quality problems, such as contracts involving new producers, or technically complex parts, or parts critical to flight safety. According to AVSCOM, about 80 percent of these inspections identify significant quality defects in contractor processes or products. Nevertheless, as workload increased from 1984 through 1986, signaling the need for staff increases, staffing for quality assurance work actually decreased.

AVSCOM has not been making all the required inspections. In fiscal year 1985, AVSCOM determined that 844 high risk candidates required on-site inspections of contractor operations and products, but then only made 210 of them, or about 25 percent. AVSCOM made even fewer inspections in fiscal year 1986—128 or 18 percent, of over 700 high risk candidates.

According to AVSCOM officials, the failure to inspect contractor operations or products for all higher risk contracts has contributed to an increase in defective repair parts received Army-wide. Senior AVSCOM officials advised us that AVSCOM did not perform all required inspections because it lacked sufficient staff and funds to handle its increasing workload.

DOD Comments

DOD agreed that the lack of inspection discipline by AVSCOM and DCAS increase the risk of low quality spare parts. It said the Army needs to ensure that measures are taken to solve this problem, including addressing issues such as quality assurance inspections, staffing requirements, and fund shortages.

In commenting on the increase in defective parts received Army-wide, DOD said that a significant reason for the increase was an extensive effort by AMC to promote more and better reporting of defective materiel throughout the Army. DOD said there were no studies to indicate that a significant degradation in quality had occurred, or that there is any link

between increased reported defective materiel to recent procurement legislative reforms.

We agree that the reported increases in defective materiel could have resulted from AMC's increased emphasis on reporting, and our report has been revised accordingly. As noted earlier, AVSCOM officials said the failures to inspect contractor operations and products were contributing to an increase in defective parts Army-wide. However, we recognize that how much of the problem was poor reporting versus an actual increase in defective parts is not known.

Parts Shortages Cause a Problem Army-Wide

While we limited our review to parts shortages affecting Corpus Christi Army Depot, repair parts shortages are a major problem at other Army maintenance depots as well according to senior AMC officials. They said that repair parts shortages are the greatest problem they face managing depot overhaul programs. Overall, these officials estimate that working around repair parts shortages increases overhaul labor costs for major Army weapons systems and associated components by 10 to 15 percent or $75 to $112 million in fiscal year 1985.

In addition, according to AMC and DESCOM officials, working around frequent repair parts shortages deprives the Army of the benefits of annual productivity improvements. These officials estimated that eliminating shortages would allow depots to realize an additional 2 percent improvement per year. Had the Army been able to achieve that 2 percent per year of additional productivity improvement, output by its maintenance depots would have increased by $46.5 million between fiscal years 1984 and 1986.

Moreover, AMC and DESCOM officials told us that the management control weaknesses we identified at AVSCOM exist to varying degrees throughout AMC. This view was supported by a recent DESCOM study which showed that none of AMC's major subordinate commands could effectively track and coordinate the delivery of repair parts purchased by other Army commands or government agencies for depot overhaul programs.

AMC and DESCOM officials also said that the quality assurance weaknesses we identified at AVSCOM may exist in other AMC commands. Quality assurance staff and funds have been cut throughout AMC. For example, between fiscal years 1986 through 1988 DESCOM quality assurance staff, which is about a quarter of AMC's total quality assurance staff, is being cut by 14 percent. At the same time, workload is increasing. Thus the

conditions that resulted in AVSCOM making only a small percentage of required quality assurance inspections, according to these officials, probably exist throughout AMC.

DOD Comments

DOD generally agreed that repair parts shortages occurred at all of the Army's depots and major subordinate commands. It said the shortages could be traced to inaccurate requirements determinations, excessive procurement lead times, and quality problems. DOD outlined a number of actions which AMC has taken to attack the factors contributing to these shortages. (See comments on page 22 for specific actions identified.)

Army Action to Correct Parts Shortages and Quality Problems

During our review, we discussed with officials at AMC, AVSCOM, and DESCOM our findings of increasing parts shortages at the depot, problems in managing the procurement process, and the receipt of defective parts.

As a result of suggestions we made, AVSCOM and DESCOM began taking actions to improve their management control system. In recognition that a better job of managing repair parts procurements is needed, AVSCOM has established standards on how long intermediate procurement steps should take and has implemented a system to track individual procurements against these standards. DESCOM is working to develop and implement an automated system that will allow all AMC subordinate commands to monitor critical parts shortages for overhaul programs at all Army maintenance depots.

Because these corrective actions were either planned or recently implemented, we could not assess their effect on correcting or reducing the impact of repair parts shortages.

Regarding the increasing number of defective parts received at the depot and the Army's failure to inspect contractors manufacturing these parts, the Army recognizes this problem is caused by staffing and travel fund shortages, but explains that other programs have higher priority.

DOD Comments

DOD agreed with the discussion of Army actions taken or underway. It pointed out that while DESCOM's Critical Maintenance Repair Parts System has achieved favorable results for DLA-managed items, improvements are needed for items managed by AVSCOM.

Conclusions

The Army could increase its depot maintenance output and increase the number of mission-capable helicopters by ensuring that repair parts are available when needed at Corpus Christi Army Depot. The depot cannot overhaul helicopters and associated engines and components efficiently and in required numbers without repair parts. While work around procedures enabled the depot to compensate to some extent for parts shortages, these procedures increased labor costs per unit overhauled.

Resolving parts shortages or correcting defects after they are discovered at the depot is unworkable—by then it is simply too late. The depot needs to know well in advance of impending delays in the purchase or delivery of parts in order to plan and switch to alternate repair programs effectively.

AVSCOM is improving its management of the procurement process by tracking the progress of parts procurements, alerting responsible managers when delays occur and establishing standards for how long procurement steps should take. If staff and travel funds permit, AVSCOM could also strengthen its quality assurance program by making more required inspections of high-risk contracts.

The improvements planned or recently implemented should provide Army managers with the information to help them identify shortages earlier and to take action to resolve them or schedule other overhauls until parts are available. This information, on an exception basis, should also make repair parts shortages and their effects more visible to top management, allowing these officials to become more involved in resolving these problems.

Because of the Army's planned and recently-implemented improvements, we are making no recommendations at this time.

Comments From the Department of Defense

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

PRODUCTION AND
LOGISTICS
(L/SPM)

OCT 1 1987

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

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) final report, "DEPOT MAINTENANCE PRODUCTIVITY: Problems in Procuring Helicopter Parts Result in Shortages and Added Costs," Dated July 17, 1987 (GAO Code 410511), OSD Case 7357. The DoD generally agrees with the report. Comments relative to each of the findings raised in the report are enclosed.

Prior to the initiation of this audit, many of the problems were well known by the Army. In fact, action had already been taken to address many of the issues. Actions, however, are still continuing, and additional Army management attention will be required over the next several months.

Sincerely,

Robert B. Costello

DEPARTMENT OF DEFENSE COMMENTS ON

GAO DRAFT REPORT - DATED JULY 17, 1987
(GAO CODE 410511) OSD CASE 7357

"DEPOT MAINTENANCE PRODUCTIVITY: PROBLEMS IN PROCURING HELICOPTER PARTS RESULT IN SHORTAGES AND ADDED COSTS"

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FINDINGS

FINDING A: Helicopter Parts Shortages Have Increased Labor Costs. The GAO reported that the Corpus Christi Army Depot performs most overhauls, major repairs and scheduled maintenance on Army helicopters. The GAO found that in recent years the depot has experienced growing shortages of repair parts, with an increasing affect on maintenance programs. The GAO found that to deal with these shortages, the depot attempted to work around them rather than stop the overhaul programs. According to the GAO, the most commonly used work around procedure was repairing worn parts that otherwise are normally thrown away. The GAO reported that such work around procedures add extra steps to the overhaul, such as removal, inspection and repair of the parts. The GAO also found that sometimes extensive, costly repairs were required, while at other times it was not possible to repair the worn parts, requiring the depot to manufacture its own repair items. The GAO reported that depot officials estimated that at least 15 percent of the depot's overhaul labor hours were used to work around shortages. Based on this estimate, the GAO reported that at least 677,000 labor hours, costing $24 million, was required for work around procedures. The GAO concluded, therefore, that the parts shortages experienced by the Corpus Christi Army depot have increased overhaul labor costs. (pp. 1-2, pp. 11-15/GAO Draft Report)

DoD Response: Concur.

FINDING B: Parts Shortages Reduced Depot Output. The GAO found that when the depot was unable to work around the parts shortages, it reduced or stopped the output of overhauled engines and components until the parts became available. The GAO found that as a result, the number of overhauled engines and components available to units also fell, grounding hundreds of Army helicopters. The GAO noted that, according to Army officials, this has degraded Army readiness. According to the GAO, a 1986 study by the Army Aviation Systems Command (AVSCOM) also identified this situation. The GAO reported that during the 18-month period covered by the AVSCOM study, an average of 29 percent of UH-1 helicopters were grounded, primarily for lack of overhauled components. The GAO concluded that repair parts

shortages have resulted in reductions in aircraft availability. (pp. 1-2, pp. 15-17/GAO Draft Report)

DoD Response: Concur.

FINDING C: The AVSCOM Lacked An Effective Management Control System. The GAO reported that when purchasing parts, a series of consequential steps is performed by various AVSCOM offices. The GAO noted that it is necessary to know where and when any delays occur in this process to enable remedial action to be taken. The GAO found, however, that at the AVSCOM the status of a procurement action, once entered into the process, could not be readily determined. According to the GAO, the absence of such a system became a significant management barrier for the AVSCOM beginning in 1983, when new steps were added to the procurement process to increase competition and reduce prices. The GAO found, for example, that most of the AVSCOM procurements experienced substantial delays in FY 1985, increasing the time required to procure parts. The GAO also found instances where parts procurements were delayed for months in different offices for various reasons. The GAO reported that a recent internal AVSCOM study also noted these management control weaknesses at the AVSCOM. The GAO concluded that without an effective management control system, the AVSCOM management did not have adequate information on procurement problems and, therefore, could not act effectively. The GAO further concluded that as the AVSCOM procurement delays increased, shortages at the depot increased, cascading into more inefficient work around activity at the depot. (pp. 1-3, pp. 17-21/GAO Draft Report)

See comments on page 13.

DoD Response: Partially concur. The DoD agrees that the AVSCOM lacked an effective management control system for the procurement of spare parts. As recognized by the GAO (see Finding F), however, actions have been taken, and further actions are planned, to improve the parts management process. The draft GAO report highlights a well known problem, and one that was already being addressed when the GAO auditors visited the AVSCOM. A Procurement Review Planning Group (PRPG) was formed in September 1985, and made 149 specific recommendations by December 1985. These recommendations spanned the full gamut of the acquisition process, and have since all been implemented. Some of the areas addressed by the recommendations include paperwork processing, breakout efforts, procurement work directive (PWD) prioritization, establishment of a technical review group to expedite procurement packages, accountability improvements, a line stopping item forecasting system, and improvements to the Procurement Aging and Staging System (PASS). (Although the PASS system had long existed to track the location and status of procurement actions, action was necessary to improve the systems integrity and add additional milestones.) These actions will significantly improve the AVSCOM management control system.

Additionally, competition initiatives such as the implementation of the Competition In Contracting Act (CICA),

emphasis on spare parts breakout, the reduction of Unpriced Contractual Actions, and inadequate resources (personnel) increased the AVSCOM Procurement Acquisition Lead Time (PALT). The implementation of the CICA had a greater effect on the AVSCOM ability to procure spares in a more timely manner because that Command had the highest percentage of noncompetitive procurement requirements in the Army.

FINDING D: Parts Quality Requirements Not assured. The GAO reported that the AVSCOM is responsible for assuring that repair parts meet quality requirements. According to the GAO, for most contracts the AVSCOM relies on the Defense Contract Administration Service (DCAS) to inspect contractor operations and products. The GAO reported that where abnormally high risk of quality problems exist, however, regulations require the AVSCOM to inspect the operations and products. The GAO found that the AVSCOM has not been performing all the inspections required. The GAO reported, for example, that the AVSCOM has not been performing all the inspections required. The GAO reported, for example, that the AVSCOM performed only about 25 percent of the required inspections in FY 1985 and about 18 percent in FY 1986. The GAO also reported that AVSCOM officials cited the lack of sufficient staff and funds as reasons why all the required inspections were not done. The GAO reported that AVSCOM officials also stated that the failure to inspect contractor operations or products for all higher risk contracts has contributed to an Army-wide increase in defective repair parts received. The GAO concluded that the increase in defective repair parts is another factor that decreased the availability of overhauled engines and components to support Army aviation units. (pp. 2-3, pp. 22-23/GAO Draft Report)

See comments on page 14.

DoD Response: Concur. The DoD agrees that the lack of inspection discipline by the AVSCOM and the DCAS increases the risk of low quality spare parts. The Army needs to ensure that measures are taken to solve this problem, including addressing issues such as quality assurance inspections, staffing requirements and fund shortages. The GAO made the assumption that the 25 percent increase in the number of reported instances of defective materiel indicated a degradation in the quality of helicopter parts. It should be noted that a significant reason for this increase was an extensive public relations effort by the Army Materiel Command (AMC) to promote more and better reporting throughout the Army. The 25 percent increase at the AVSCOM is consistent with a 30 percent AMC-wide increase during the same time for all commodities. There are no known studies to indicate that there was a significant degradation in quality based on an increased number of reported instances of defective materiel, or that there is a link to recent procurement legislative reforms.

FINDING E: Parts Shortages And Problems Are Not Limited To The AVSCOM. The GAO reported that Army Materiel Command (AMC) officials stated that repair parts shortages is the greatest problem affecting the management of the depot overhaul program.

According to the GAO, AMC officials estimated work around efforts increased overhaul labor costs by between $75 million and $112 million in FY 1985. The GAO reported that both AMC and Depot System Command (DESCOM) officials also believe that opportunities for productivity improvements of about two percent per year were lost at all Army maintenance depots because of the disruptions caused by parts shortages. The GAO further reported that, according to AMC officials, the management control and perhaps the quality assurance weaknesses the GAO identified at the AVSCOM (Findings C and D) exist to varying degrees throughout the AMC. The GAO concluded that the repair parts shortages and their causes is a problem Army-wide. (p. 4, pp. 23-25/GAO Draft Report)

DoD Response: Concur. The DoD acknowledges that all of the Army depots and the AMC major subordinate commands (MSC) experienced certain degrees of repair parts shortages that can be traced to inaccurate requirements determination, excessive procurement lead times, and quality problems. The AMC, however, has taken action to attack the factors that contribute to depot maintenance repair part shortages. These actions include:

- quarterly review of the parts explosion process for improved requirements determination;
- increased use of the National Stock Number Master Data Record (NSNMDR) file data on all repair parts used in the overhaul of weapon systems, regardless of logistic assignment, to allow commands to inform each other of impending programs that will draw repair parts;
- attention by depots and depot maintenance contractors to report all repair parts consumed during depot repair or overhaul, regardless of source, to provide more timely failure rate updates;
- semi-annual AMC Headquarters requirements determination compliance reviews; and
- completion of an extensive study of current maintenance requirements, workloading, and program execution to further enhance the requirements determination process.

FINDING F: Army Actions To Correct Parts Shortages And Quality Problems. The GAO reported that, in recognition of the parts shortages and problems discussed, the Army has taken, or is planning to take, several corrective actions. According to the GAO, the AVSCOM has established standards on how long intermediate procurement steps should take and has implemented a system to track individual procurements against these standards. In addition, the GAO reported that the DESCOM is working to develop and implement an automated system that will allow all the AMC subordinate commands to monitor parts supplies for overhaul programs at all Army maintenance depots. The GAO further reported that the Army recognizes that staffing and fund shortages caused the defective parts and inspection problems. The GAO reported, however, that the Army explained that other programs have higher priority. The GAO concluded that the

improvements taken or planned should provide Army managers with the information to help them identify shortages earlier, and to take action to resolve them or schedule other overhauls until parts are available. The GAO further concluded that this information, on an exception basis, should also make repair parts shortages and their effects more visible to top management, thereby allowing them to become more involved in resolving these problems. (p. 4, pp. 25-27/GAO Draft Report)

DoD Response: Concur. The DESCOM monitors critical parts shortages through the Critical Maintenance Repair Parts System. This automated report is provided to the DLA and the MSCs. Although this system is achieving significantly favorable results for DLA managed items, reports sent to the AVSCOM on the AVSCOM managed items indicate improvement is needed. (Also see Army actions to improve the availability of depot maintenance repair parts cited above under Findings C and E.)

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