



DEPARTMENT OF DEFENSE

# AUDIT REPORT

DEPOT MAINTENANCE WORK LOAD MANAGEMENT

No. 90-081

June 7, 1990

*Office of the  
Inspector General*





INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-2884

June 7, 1990

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (FINANCIAL  
MANAGEMENT)  
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL  
MANAGEMENT)  
ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Report on the Audit of Depot Maintenance Work Load  
Management (Report No. 90-081)

This is our final report on the Audit of Depot Maintenance Work Load Management for your information and use. Responses to a draft of this report were considered in preparing the final report. The audit was made from November 1988 through September 1989. The primary audit objective was to evaluate the effectiveness of the management of the depot maintenance work load. We concentrated our audit on the procedures for source selection for repairs, the procedures for assigning mobilization work load to the depots, and the procedures for developing realistic and achievable depot maintenance mobilization plans. We also evaluated applicable internal controls. DoD plans to spend about \$13 billion for depot maintenance during FY 1990.

The Military Departments had made significant improvements in depot maintenance mobilization planning; however, additional improvements were needed. The results of the audit are summarized in the following paragraphs, and the details, audit recommendations, and management comments are in Part II of this report.

The Military Departments' mobilization plans were not in compliance with the procedures established in DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982. The DoD maintenance activities' ability to meet mobilization requirements was questionable. The audit identified approximately 740,000 hours of annual work load assigned to depots that exceeded the 250-percent guidelines in DoD Directive 4151.1. We recommended that the Military Departments comply with the policy contained in DoD Directive 4151.1 (page 5).

The Army National Guard's Aviation Classification and Repair Depot at Fresno, California, did not have the capability to perform about 149,000 direct labor hours of assigned mobilization work load for the regular Army. We recommended that the Assistant Secretary of the Army (Installations and Logistics) and

the Chief of the Army National Guard Bureau upgrade the capability of the Aviation Classification and Repair Depots to accomplish mobilization work load or determine alternate sources-of-repair for the mobilization work load (page 13).

The Army's Aviation Systems Command did not compute reliable mobilization requirements based on the latest Defense Guidance or surge requirements by type of equipment. As a result, the FY 1989 mobilization requirements computations omitted about 374,000 direct labor hours. We recommended that the Assistant Secretary of the Army (Installations and Logistics) establish policy that provides for annual computation of mobilization requirements using the latest Defense Guidance and the mobilization surge rates that reflect planned use of equipment during mobilization (page 17).

The Military Departments did not fully document the results of the Decision Tree Analysis (DTA) process for determining sources of depot-level repair. Also, the Army had not formally adopted and implemented the DTA process. Failure to use a logical, predefined process in determining source-of-repair decisions may result in inefficient use of DoD maintenance resources. We recommended that the Assistant Secretary of the Army (Installations and Logistics) complete revision of Army Regulation 750-2. We also recommended that the Military Departments issue guidelines that define pertinent documentation that must be retained in support of depot repair decisions (page 21).

The audit identified internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. The procedures used to avoid assigning excessive mobilization work load to individual production shops were not effective. The Army's procedure of assigning mobilization work load to the Army National Guard did not assess the unit's ability to actually perform the work. Recommendations A.1., A.2., and B. in this report, if implemented, will correct the weaknesses. The senior officials responsible for internal controls within the Military Departments are being provided a copy of this report.

On February 6, 1990, a draft of this report was provided to the Assistant Secretary of Defense (Production and Logistics), the Assistant Secretary of the Army (Financial Management), the Assistant Secretary of the Navy (Financial Management), and the Assistant Secretary of the Air Force (Financial Management and Comptroller). Comments on the draft report were received from the Assistant Director for Maintenance Management, Office of the

Deputy Chief of Staff for Logistics, Department of the Army, on April 5, 1990; the Assistant Secretary of the Navy (Research, Development and Acquisition) on May 4, 1990; and the Deputy Assistant Secretary (Logistics), Department of the Air Force, on April 6, 1990. The complete texts of management comments are provided in Appendixes B, C, and D.

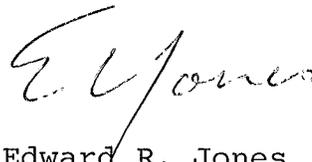
The Assistant Director for Maintenance Management, Office of the Deputy Chief of Staff for Logistics, Department of the Army, generally concurred with the Findings and Recommendations A.2., B., C.1., C.2., D.1., and D.2.; however, the Army's corrective actions taken and planned are not entirely responsive to the recommendations. Corrective actions cited in management comments for Recommendations A.2.a. and A.2.b. were for the Corpus Christi Army Depot. We intended that the recommendations be applied to all Army depots. The Army's corrective action in response to Recommendation A.2.b.(2). will not correct the problem. Filing mobilization manpower requirements with the local state employment office does not identify potential sources for new hires. The Army's response to Recommendation B. was responsive; however, it did not contain a completion date for the planned actions. For Recommendations C.1. and C.2., the Army had not planned corrective actions at the time that the management comments were prepared. For Recommendation D.2., the Army erroneously stated that Army Regulation 750-2 was amended to provide for retention of pertinent documentation in support of source-of-repair decisions. Also, the Army did not provide estimated dates for completion of planned actions in response to Recommendations A.2.a., A.2.b.(4)., and B. We ask that the Assistant Secretary of the Army (Installations and Logistics) provide descriptions of Army-wide corrective actions for Recommendations A.2.a., A.2.b., B., C.1., C.2., and D.2., and estimated dates for completion of planned actions in responding to the final report.

The Assistant Secretary of the Navy (Research, Development and Acquisition) concurred with the Findings and Recommendations A.1., A.2., and D.2. and therefore additional comments are not required.

The Deputy Assistant Secretary of the Air Force (Logistics), concurred with Recommendation D.2. and with the intent of Recommendations A.1. and A.2. Management's actions on Recommendations A.1. and D.2. are responsive, and no additional comments are required. However, the Air Force did not clearly state what actions were taken or planned for Recommendation A.2. We request that the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics) provide descriptions of planned actions and estimated dates for completion of actions for Recommendation A.2. in responding to the final report.

DoD Directive 7650.3 requires that all audit recommendations be resolved within 6 months of the date of the final report. Accordingly, final comments on unresolved issues in this report should be provided within 60 days of the date of this memorandum. This report claims no monetary benefits (Appendix E).

The courtesies and cooperation extended to the staff during the audit are appreciated. Audit team members are listed in Appendix G. If you have any questions on this audit, please contact Mr. Thomas F. Gimble on (202) 694-6227 (AUTOVON 224-6227) or Mr. Charles E. Sanders on (202) 694-6219 (AUTOVON 224-6219). Copies of this report are being provided to the activities listed in Appendix H.



Edward R. Jones  
Deputy Assistant Inspector General  
for Auditing

Enclosure

cc:

Secretary of the Army  
Secretary of the Navy  
Secretary of the Air Force  
Assistant Secretary of Defense (Production and Logistics)

REPORT ON THE AUDIT OF  
DEPOT MAINTENANCE WORK LOAD MANAGEMENT

TABLE OF CONTENTS

|  | <u>Page</u>    |
|--|----------------|
| TRANSMITTAL MEMORANDUM/EXECUTIVE SUMMARY                               | i              |
| PART I - INTRODUCTION  | 1              |
| Background   | 1              |
| Objectives and Scope   | 1              |
| Internal Controls  | 2              |
| Prior Audit Coverage   | 3              |
| PART II - FINDINGS AND RECOMMENDATIONS                                 |                |
| A. Planning for Organic Depot Maintenance<br>Mobilization Requirements | 5              |
| B. Use of Army National Guard Units During<br>Mobilization             | 13             |
| C. Army Depot Maintenance Mobilization Requirements                    | 17             |
| D. Source-of-Repair for New Systems                                    | 21             |
| APPENDIXES   | See next page. |

Prepared by:  
Logistics Support Directorate  
Project No. 9SA-0013

## LIST OF APPENDIXES

|   | <u>Page</u> |
|---|-------------|
| APPENDIX A - Peacetime Requirements Excluded from FY 1989<br>Mobilization Requirements for Depot<br>Maintenance of Aviation Items | 25          |
| APPENDIX B - Department of the Army Comments  | 31          |
| APPENDIX C - Department of the Navy Comments  | 37          |
| APPENDIX D - Department of the Air Force Comments   | 39          |
| APPENDIX E - Summary of Potential Monetary and Other<br>Benefits Resulting from Audit   | 45          |
| APPENDIX F - Activities Visited or Contacted  | 47          |
| APPENDIX G - Audit Team Members   | 49          |
| APPENDIX H - Final Report Distribution  | 51          |

REPORT ON THE AUDIT OF DEPOT MAINTENANCE  
WORK LOAD MANAGEMENT

PART I - INTRODUCTION

Background

DoD plans to spend approximately \$13 billion for depot maintenance in FY 1990. The maintenance source-of-repair may be either a contractor or a Government facility. The source-of-repair is selected through a Decision Tree Analysis (DTA). In the DTA process, capacities and capabilities of Government facilities, priorities of mission need, and economics of repair by contractor versus Government facilities are assessed to select the source-of-repair. It is DoD policy to establish and maintain the minimum physical capacities and capabilities necessary to ensure a controlled source of technical competence and the resources necessary to meet mobilization and other military contingencies. The Military Departments determine the depot maintenance requirements for both peacetime and mobilization. These requirements are matched to available physical capacities and capabilities and funded through the DoD planning, programming, and budgeting processes. If the requirements are properly matched, the Military Departments will be able to provide for mobilization requirements, as specified in Defense Guidance. The Defense Guidance also specifies that the Military Departments be able to efficiently and effectively satisfy objectives for peacetime readiness and sustainability of troops during combat.

Objectives and Scope

Our overall audit objective was to evaluate the effectiveness of the management of the depot maintenance work load. We concentrated our audit on the procedures for source selection for repairs, the procedures for assigning mobilization work load to the depots, and the procedures for developing realistic and achievable depot maintenance mobilization plans. We also evaluated applicable internal controls.

To determine if the Military Departments had established DTA processes for new systems, we reviewed their implementing procedures and selected source-of-repair decisions. For the Army, we reviewed decisions for six systems being fielded and logistically supported subsequent to 1984 by the Army's Aviation Systems Command and the Communications-Electronics Command. For the Navy, we reviewed source-of-repair actions for 40 new systems that were introduced between October 1985 and August 1989. For the Air Force, we reviewed source-of-repair actions for 16 new systems that were introduced between FY 1986 and FY 1989.

To evaluate the procedures for assigning mobilization requirements to organic depots, we reviewed procedures and internal controls for assigning depot maintenance work load to the Corpus Christi Army Depot, the North Island Naval Aviation Depot, and the San Antonio Air Logistics Center. Specifically, we reviewed the adequacy of records that depots maintained for capacities of their production shops. We determined whether individual production shops were workloaded with mobilization requirements in excess of 250 percent of their physical capacity. We also reviewed the adequacy of plans to accomplish mobilization work load. These evaluations covered FY 1989 plans for Corpus Christi and FY 1990 plans for the other two depots. We tested data from 148 production workshops that had been assigned 17.5 million hours of mobilization work load at the Corpus Christi Army Depot and the San Antonio Air Logistics Center.

We evaluated procedures for assigning mobilization requirements to the Army National Guard's Aviation Classification and Repair Activity Depots (AVCRAD). We also evaluated the procedures used by the U.S. Army Aviation Systems Command for determining depot maintenance mobilization requirements.

This economy and efficiency audit was made from November 1988 through September 1989 in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD, and accordingly, included such tests of internal controls as were considered necessary. Activities visited or contacted during the audit are listed in Appendix F.

### Internal Controls

We evaluated internal controls over the selection of sources of depot repair by determining if the Military Departments had implemented a formal source of selection for repair analysis. In evaluating the assignment of work load at organic depots and the California AVCRAD, we assessed internal controls by determining if the depot activities were assigned mobilization work load in excess of their capabilities. We found internal control weaknesses in the methods that the Military Departments used in assigning work load to individual production shops at organic depots and also the procedures that the Army used in assigning work load to the AVCRAD. Implementation of Recommendations A.1., A.2., and B. will correct the internal control weaknesses identified in this report. The weaknesses are discussed in Findings A. and B.

### Prior Audit Coverage

Inspector General, DoD, Report No. 84-123, "Survey Report on the Selection of Repair Sources," August 22, 1984, concluded that the Military Departments had not fully implemented or established a definitive schedule to complete the implementation of DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel." In response to the report recommendations, each Military Department initiated actions to develop a Decision Tree Analysis for determining sources-of-repair for depot maintenance and a workload posture plan.



## PART II - FINDINGS AND RECOMMENDATIONS

### A. Planning for Organic Depot Maintenance Mobilization Requirements

#### FINDING

The Military Departments' mobilization plans for organic depot maintenance were not in compliance with guidelines established in DoD Directive 4151.1, "Use of Contractor and DoD Resources for the Maintenance of Materiel," July 15, 1982, and the plans did not appear to be fully achievable. The condition occurred because the Navy and Air Force did not maintain current capacity data and the Army and Air Force assigned planned mobilization work load to individual production shops that was in excess of the established DoD guidelines. As a result, the work force transition plans to move from a peacetime to mobilization structure were not ready for implementation. The DoD maintenance activities' ability to surge to meet the mobilization requirements was questionable. For example, we identified approximately 740,000 hours of planned mobilization work load for Army and Air Force that exceeded the 250-percent guidelines specified in the DoD guidance.

#### DISCUSSION OF DETAILS

Background. DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982, requires that the Military Departments annually determine the minimum capabilities and physical capacities needed at organic depots to provide a ready, controlled source of technical competence and resources necessary to support a military contingency. Workload distribution plans should be prepared annually to show assignment of maintenance requirements in peacetime and mobilization by depot. Also, depots should prepare time phased mobilization plans annually to accomplish work load during mobilization. A major consideration in preparing mobilization plans is hiring, training, and integrating personnel to augment peacetime work forces.

DoD policy for assigning work load based on facility capacity states that the Military Departments should plan to accomplish an equivalent of 100 percent of peacetime work load based on a one-shift, 40-hour week with the equivalent facility utilization of 185 percent of physical capacity during mobilization. In sizing capability and physical capacity of high surge (utilization greater than 185 percent of physical capacity), the production shops shall consider limiting shop utilization to a maximum of 250 percent of physical capacity in mobilization. When mobilization work load in excess of 250 percent of physical capacity is forecast, increasing the shop's capacity may be warranted so that the shop can accomplish mobilization requirements.

DoD Directive 4151.15, "Depot Maintenance Support Programming Policies," November 22, 1976, and DoD 4151.15H, "Depot Production Shop Capacity Measurement Handbook," July 28, 1976, provide guidelines for determining the physical capacity and peacetime workload capacity of an organic depot. Physical capacity is defined as the amount of work load, expressed in actual direct labor hours, that a facility can accommodate with all work positions manned on a one-shift, 5-day, 40-hour week basis while producing the product mix that the facility is designed to accommodate. Peacetime workload capacity is the physical capacity that a facility can effectively produce with limitations such as the availability of direct labor resources.

Mobilization Workload Assignments. To evaluate the Military Departments' mobilization planning, we selected a depot in each Military Department that supported aircraft. The depots selected for audit were the Corpus Christi Army Depot, the North Island Naval Aviation Depot, and the San Antonio Air Logistics Center. Collectively, these depots were assigned about 23.7 million direct labor hours planned for depot maintenance of aviation related items during mobilization. We reviewed about 17.5 million of these hours assigned to 148 Army and Air Force production shops. We determined whether the depots maintained complete and accurate depot shop capacity data. We determined whether the Army depot for FY 1989 and the Air Force depot for FY 1990 were work loaded with mobilization requirements in excess of the DoD guidelines of 250 percent of the physical capacity of individual production shops. At the time of the audit, the Air Force capacity data for all production shops were not current. The Navy did not maintain reliable shop capacity data on file for its depots; therefore, we could not determine whether the Navy could accomplish mobilization requirements. Also, we reviewed the depots' mobilization plans, particularly those for augmentation of peacetime work forces, to determine if they were prepared in sufficient detail for effective implementation.

Corpus Christi Army Depot. Corpus Christi Army Depot was assigned 6.0 million direct labor hours of mobilization workload. We reviewed 70 production shops that had been assigned 5.5 million of the 6.0 million hours for FY 1989. We determined that two production shops had been assigned 46,363 direct labor hours of mobilization work load in excess of 250 percent of their physical capacities.

| <u>Shop</u>             | <u>Direct Labor Hours<br/>In Excess of 250 Percent<br/>of Physical Capacity</u> |
|-------------------------|---|
| Depreservation Unit     | 6,597   |
| Cargo Transmission Unit | 39,766  |
| Total                   | <u>46,363</u>   |

North Island Naval Aviation Depot. The Navy did not maintain current capacity data for the Aviation Depot. The latest data were developed in 1982. We selected 27 existing production shops, but we could only identify capacity for 5. This indicated that significant changes had occurred in the organizational structure of the depot since 1982. For example, the F-14 repair shops at North Island were established in 1988 and therefore were not included in the 1982 capacity data. According to the FY 1989 Performance Summaries, 700,779 direct labor hours were consumed in the F-14 shops. Since accurate capacity data were not available, we did not analyze the assignment of mobilization work load at the production shop level in the Navy.

San Antonio Air Logistics Center. The San Antonio Air Logistics Center was assigned mobilization work load for FY 1990, requiring 15,298,320 direct labor hours. We reviewed the work load, which required 11,979,612 direct labor hours and was planned to be accomplished at 78 production shops (the Air Force referred to its production shops as resource control centers). We determined that 35 (47 percent) of the 78 production shops reviewed had a work load that was 693,552 direct labor hours in excess of 250 percent of their physical capacities.

| <u>Type of<br/>Shop</u> | <u>Number of<br/>Shops</u> | <u>Direct Product<br/>Actual Hours</u> |
|-------------------------|----------------------------|--|
| Aircraft                | 10                         | 159,240                                |
| Engine                  | 13                         | 230,220                                |
| Technology              | 12                         | 304,092                                |
| Total                   | <u>35</u>                  | <u>693,552</u>                         |

Planned use of 22 of the 35 shops was in excess of 300 percent of the shops' physical capacities. For example, the engine welding shop, with 31 work positions, had a physical capacity of 58,900 direct labor hours. Using this capacity for three shifts would provide 176,700 direct labor hours without considering fatigue and deficiency factors of working second and third shifts. Mobilization work load for the shop totaled 242,808 direct labor hours. This work load exceeded the shop's three-shift capacity by 66,108 direct labor hours. Additional facilities and equipment would be required to accomplish the assigned work load during mobilization.

Implementation of Mobilization Plans. Effective mobilization plans include the identification of the appropriate mixture of personnel skills to accomplish the mobilization work load. The personnel skills would be matched against existing resources to identify the areas of shortfall. The mobilization plan should then state definitive procedures, including identification of viable sources of personnel, to satisfy the shortfall. The plans should be feasible and in place before mobilization. Our review of mobilization plans at the three depots visited indicated that the Military Departments needed to emphasize the importance of preparing plans.

Corpus Christi Army Depot. To accomplish FY 1989 mobilization work load, the depot planned to work one 10-hour shift, 6-days-a-week, which totaled 2,466 direct labor hours per work position per year in the production shops. Personnel requirements were determined by developing a Mobilization Table of Distribution and Allowances (TDA) by increasing peacetime mobilization TDA positions by 37.5 percent. This rate of increase was derived by dividing the assigned mobilization work load of 6.9 million labor hours by the 2,466 direct labor hour factor. The peacetime TDA was evaluated as of April 1988 to identify the assigned personnel that would remain at the depot at the time of mobilization. The results of the analysis were compared to the Mobilization TDA to determine personnel shortages by job skill for mobilization. The depot determined that it would need to hire about 1,100 personnel during mobilization. The depot assumed that positions in the Mobilization TDA could be filled initially by promoting the peacetime personnel. The remaining personnel positions would be filled from the private sector. The depot made no attempt to determine the feasibility of hiring about 1,100 personnel with desired job skills from the private sector.

North Island Naval Aviation Depot. The depot had not updated its mobilization plan since 1985 and had not implemented the provisions of the plan. The 1985 plan required that the depot establish a task force to develop a comprehensive list of additional personnel by skill level required for mobilization, a list of potential manpower augmentation sources, and procedures to train new personnel. None of these provisions were in place at the time of our audit.

San Antonio Air Logistics Center. The Center's mobilization plan provided guidance for work force transition from peacetime to a mobilization structure. Specifically, the plan required the accounting of secondary skills of the current work force, projected depot gains and losses of personnel due to activation of Reserve units, and potential sources to replace personnel shortages. The plan also contained instructions for

compression of repair specifications that will accelerate the repair of materiel by the depot during mobilization. These data were not current at time of audit. However, the Air Force planned to update the data quarterly, and this will ensure that the mobilization plans stay current and viable.

#### RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Assistant Secretary of the Navy (Research, Development and Acquisition)<sup>1/</sup> and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics) direct the maintenance activities to comply with the requirements of DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982, as it relates to capacity determination.

2. We recommend that the Assistant Secretary of the Army (Installations and Logistics), the Assistant Secretary of the Navy (Research, Development and Acquisition)<sup>1/</sup>, and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics):

a. Require that mobilization planning be accomplished at the production shop level.

b. Require depots to include in their annual mobilization plans for personnel augmentation:

(1) The number of anticipated new hires for each production shop by job series and skill level.

(2) Potential sources for new hires by job series and skill level.

(3) Procedures for training and integrating new hires with peacetime labor forces during mobilization.

(4) Identification of skills for on-board personnel and their planned use during mobilization.

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<sup>1/</sup> In the draft report, the recommendation was addressed to the Assistant Secretary of the Navy (Shipbuilding and Logistics). Effective March 12, 1990, this position and the Assistant Secretary of the Navy (Research, Engineering and Systems) were disestablished and replaced by the Assistant Secretary of the Navy (Research, Development and Acquisition).

### MANAGEMENT COMMENTS

The Assistant Director for Maintenance Management, Office of the Deputy Chief of Staff for Logistics, Department of the Army, generally concurred with the Finding, fully concurred with Recommendations A.2.a. and A.2.b.(1). through (3)., and partially concurred with Recommendation A.2.b.(4). In response to Recommendation A.2.a., the Army plans to issue guidance to the Corpus Christi Army Depot that would require the depot to plan for mobilization at the production shop level. Recommendations A.2.b.(1). through (3). have been implemented at Corpus Christi. The number of new hires anticipated for each production shop have been identified by job series and skill level. Procedures for training and integrating new hires with peacetime labor forces during mobilization are in place. Mobilization manpower requirements have been filed with personnel from the local state's employment office. In response to Recommendation A.2.b.(4)., the Army stated that identification of secondary skills for all depot personnel is not practical since most depot personnel would perform the same function during mobilization as they do in peacetime. The identification of secondary skills should be limited to personnel who would perform new functions during mobilization.

The Army also advised that the mobilization work load at Corpus Christi Army Depot and the direct labor hour planning factor cited in the draft report were erroneous.

The Assistant Secretary of the Navy (Research, Development and Acquisition) concurred with the Finding and with Recommendations A.1. and A.2. The Navy plans to issue guidance to ensure proper mobilization planning.

The Deputy Assistant Secretary of the Air Force (Logistics), concurred with the intent of Recommendations A.1. and A.2. In response to Recommendation A.1., the Air Force tasked its Air Logistics Centers to update capacity data, as required by Air Force Logistics Center Regulation 66-4. Beginning in October 1990, the Air Force plans to use the Depot Sizing Model to maintain and update capacity data. The action was responsive to the Recommendation. Management comments did not clearly state the corrective actions taken or planned in response to Recommendation A.2.

### AUDIT RESPONSE TO MANAGEMENT COMMENTS

The Army's corrective actions planned and taken are not entirely responsive to Recommendations A.2.a. and A.2.b. We intended that the recommendations apply to all Army depots, not just Corpus Christi. Plans to issue guidance that requires Corpus Christi to accomplish mobilization planning at production shop level are

responsive to Recommendation A.2.a., but no completion date was provided for the action. Determining anticipated requirements and procedures for training and integrating new hires with the peacetime labor force during mobilization at Corpus Christi was responsive to Recommendations A.2.b.(1). and A.2.b.(3). The Army's corrective action in response to Recommendation A.2.b.(2) was not responsive. Filing mobilization manpower requirements with the local state's employment office provides no assurance that requirements can be filled by new hires. Identifying secondary skills at Corpus Christi for personnel who will perform new work load during mobilization rather than all depot personnel is responsive to the intent of Recommendation A.2.a.(4)., but no completion date was provided for the action. We ask the Army to describe planned corrective actions and estimated dates for completion of planned actions for all Army depots in responding to the final report.

We changed the Finding in the final report, as proposed, to state that the work load in the Corpus Christi mobilization plan was 6.9 million direct labor hours and the direct labor hours' planning factor was 2,466 hours. We did not adopt the Army's recommendation to change the 6.0 million direct labor hours cited in discussion of assigning work load in excess of Corpus Christi's maintenance capacity. The 6.0 million was for aviation items while the 6.9 million was for total depot work load.

The Navy's planned corrective actions are fully responsive to Recommendations A.1. and A.2.

The Air Force's corrective actions are responsive to Recommendation A.1. For Recommendation A.2., we ask the Air Force to describe corrective actions planned and estimated dates for completion of actions in responding to the final report.

We changed the reference in Recommendation A.1. from DoD Instruction 4151.1 to DoD Directive 4151.1.



## B. Use of Army National Guard Units During Mobilization

### FINDING

The Army National Guard's (the Guard) Aviation Classification and Repair Depot (AVCRAD) in Fresno, California, did not have the capability to perform the assigned mobilization work load. This condition occurred because the Army workload planners, in conjunction with the maintenance personnel at the AVCRAD, had not accurately determined if the facility could handle the assigned work load. As a result, the Army could not rely on the AVCRAD at Fresno, California, to accomplish 78 percent of the California AVCRAD's assigned FY 1989 mobilization work load, totaling about 149,000 direct labor hours.

### DISCUSSION OF DETAILS

Background. In peacetime, the four AVCRAD's in CONUS perform intermediate level maintenance in support of the Guard units within their geographical areas of responsibility. The AVCRAD's are controlled by the Adjutants General of the states that they support. During mobilization, operational control of the AVCRAD's passes to the Mobilization AVCRAD Control Element (MACE), and the units are expected to perform depot maintenance in support of the U.S. Army Depot System Command (DESCOM). MACE also represents the AVCRAD's in peacetime by determining assignments of mobilization work load.

We visited the AVCRAD at Fresno, California, to determine if the unit was capable of accomplishing FY 1989 depot maintenance mobilization requirements. The Army had not performed a capacity or capability evaluation before accepting mobilization work load for FY's 1989 or 1990. Our evaluation at the AVCRAD was based on the unit personnel's assessments in terms of the unit's ability to perform individual maintenance tasks for the assigned mobilization work load. The AVCRAD personnel evaluated the tasks identified in the End Item Codes Standards Index, commonly referred to as the shop traveler, to determine personnel skill and equipment requirements. We also reviewed personnel records to determine if the assigned personnel were qualified in the appropriate military occupational specialties (MOS) necessary to perform assigned mobilization work load. We determined that AVCRAD personnel did not reduce the production capability to reflect the impact of the non-MOS qualified workers.

Depot Maintenance Capability. The California AVCRAD was assigned about 190,000 hours of mobilization work load on the basis of availability of direct labor hours to perform the maintenance. The California AVCRAD was not capable of performing about 78 percent of its FY 1989 mobilization work load, which was about 149,000 direct labor hours. For 17 (56 percent) of the 30 aircraft related line items assigned to the AVCRAD, production

shop personnel could not perform multiple maintenance tasks due to lack of necessary equipment, tools, and training. For example, the AVCRAD could not accomplish the T-53 engine work load of 37,709 direct labor hours because it did not have a mobile engine test stand or sufficient shop space. The configuration of the engine shop did not allow for clearance of the hoist for lifting engines onto work stands. Also, the AVCRAD could not flow test the fuel control system for the T-53 engine.

The AVCRAD could not test the servo-cylinder and the hydraulic motor for the AH-1 and CH-47 helicopters, respectively. These tests required a hydraulic test stand that had an output speed of 10,000 revolutions per minute. The AVCRAD's test stand had an output speed of 5,000 revolutions per minute.

At the time of the audit, the California AVCRAD was not performing maintenance on the T-53 engine or hydraulics tests for the AH-1 and CH-47 helicopters. Plans had not been made to properly equip and train AVCRAD personnel to perform depot maintenance on these items.

The capability in terms of direct labor hours that the MACE and DESCOM used to assign work load to the California AVCRAD was overstated. In determining its capability for FY 1989, the MACE did not allow for the shortages of qualified maintenance personnel that the AVCRAD experienced. Of the 116 military maintenance personnel assigned on October 1, 1988, 11 were not qualified in their MOS skill. In other words, personnel did not receive formal training, and they did not have the opportunity to demonstrate that they could perform maintenance tasks associated with their MOS. Plans have not been made to supplement the AVCRAD staffing for mobilization.

Conclusion. The AVCRAD's were assigned work load based on their total available direct labor hours, not the capabilities of their production shops to do specific item repairs. The Army and the Guard need to reevaluate plans to use AVCRAD's in performing depot-level maintenance during mobilization to ensure the capabilities match the requirements. DESCOM plans to complete initial evaluations of the AVCRADs' mobilization readiness in FY 1990. These evaluations will be worthwhile for determining the role of the AVCRAD's during mobilization.

#### RECOMMENDATION FOR CORRECTIVE ACTION

We recommend that the Assistant Secretary of the Army (Installations and Logistics) and the Chief of the Army National Guard Bureau upgrade the capability of the Aviation Classification and Repair Depots to accomplish mobilization work load or determine alternate sources-of-repair for the mobilization work load.

## MANAGEMENT COMMENTS AND AUDIT RESPONSE

The Assistant Director for Maintenance Management, Office of the Deputy Chief of Staff for Logistics, Department of the Army, concurred with the Finding and Recommendation and stated that the Army plans to upgrade AVCRAD capabilities through training and updated support equipment to meet mobilization workload requirements. The Aviation Logistics Office of the Office of the Deputy Chief of Staff for Logistics will arrange a meeting to develop a schedule for upgrading AVCRAD capability. This schedule would also be used in determining future workload decisions. Management comments are responsive; however, the Assistant Director did not provide estimated dates for completion of planned actions. Therefore, we ask the Army to provide completion dates in responding to the final report.



## C. Army Depot Maintenance Mobilization Requirements

### FINDING

The Army's method of determining depot maintenance mobilization requirements for the Aviation Systems Command (AVSCOM) did not result in reliable requirements forecasts. This condition was partially due to lack of definitive Army guidance for recognizing different utilization rates by type of aircraft and different component failure rates for individual components. Also, the Army did not use an automated system for developing depot maintenance mobilization requirements. The FY 1989 AVSCOM organic depot mobilization work load omitted requirements for about 374,000 direct labor hours of work load. We could not determine the final impact of this omission because the estimated mobilization work load had not been increased by the mobilization surge rates.

### DISCUSSION OF DETAILS

Background. DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," requires the Military Departments to determine mobilization requirements for depot maintenance annually based on the scenarios contained in the most current Defense Guidance. The Military Departments use these requirements to assign depot work load. We evaluated the procedures that AVSCOM used in 1988 to determine mobilization requirements in support of aircraft secondary items for FY 1989. We concluded that the Army process did not result in reliable mobilization requirements.

Army Mobilization Requirements Determination Process. The Army Materiel Command had not issued definitive Army-wide policy and procedures for determining mobilization requirements for major and secondary items of materiel. In the absence of regulations from the Command, AVSCOM developed its own internal procedures for computing requirements. The methodology was described in the November 4, 1988, memorandum to the DESCOM for the FY 1989 depot maintenance mobilization requirements. AVSCOM used a data base of FY 1985 mobilization requirements as the basis for the FY 1989 requirements. The rationale for using the FY 1985 requirements was that they were the latest available automated computation of mobilization requirements. Periodically, national stock numbers (NSN's) in the mobilization data base were matched to the NSN's having current peacetime requirements. In cases where NSN's in the mobilization data base and NSN's having current peacetime requirements matched, mobilization requirements in the data base were unchanged. In cases where a NSN had peacetime requirements, but was not in the data base, AVSCOM computed mobilization requirements for the items and recorded the NSN's and requirements in the mobilization data base. AVSCOM developed depot maintenance mobilization requirements for items to be manually input into the data base by

averaging the last 3 years of depot maintenance peacetime requirements for each secondary item and multiplying this quantity by 1.5.

The AVSCOM process for determining mobilization requirements did not provide for updating mobilization requirements in the data base and computing mobilization requirements according to utilization of equipment. The use of the 1.5 factor is authorized by Army Regulation 11-11, "War Reserves," June 1, 1985, only when a more realistic factor is not available. The use of the single standard rate assumed that depot maintenance requirements would increase at the same rate for all types of components during mobilization. In contrast, both the Air Force and the Navy assume that overhaul/repair rates for engines and engine components will dramatically increase, whereas the overhaul of air frames will actually decrease. Finally, the Army method of computing depot maintenance mobilization requirements assumed that utilization of all series of Army aircraft would increase at a uniform 150-percent rate. However, Army Regulation 570-2, "Manpower Requirements Criteria (MARC) - Tables of Organization and Equipment," June 30, 1989, contains flying hour data by type of aircraft reflecting mobilization surge rates of between 148 and 340 percent for development of unit manpower requirements.

The Army eventually plans to determine its depot maintenance mobilization requirements by using the War Reserves Automated Program System (WRAPS) in conjunction with the Army's wholesale materiel management system. The WRAPS was developed primarily to calculate supply stockage and maintenance repair requirements for secondary items in response to DoD Directive 4140.47, "Secondary Item War Reserve Requirements Development," February 24, 1984. WRAPS computes unserviceable returns (items requiring depot repair) generated according to planned wartime usage of equipment for about an 8-month period. Until WRAPS is modified to generate a 12-month work load for depot maintenance, major subordinate commands cannot use WRAPS in determining depot maintenance mobilization requirements. Also, WRAPS cannot be used in determining depot mobilization requirements until a software program is developed for the interface of WRAPS and the wholesale management system. Although WRAPS has been operational since 1985, an interface for the systems has not been developed. The Army tentatively plans to complete the design of the interface by April 1991.

Validity of Aviation Requirements for Mobilization. We used the FY 1989 mobilization requirements for Corpus Christi Army Depot to evaluate AVSCOM's process for identifying items for depot maintenance mobilization requirements. To determine if the mobilization requirements included items that AVSCOM did not plan to repair in peacetime, we selected 144 of the 508 items requiring about 5.5 million (92 percent) of the 6.0 million

direct labor hours planned for FY 1989 mobilization requirements. The selected items were matched to peacetime maintenance requirements for Corpus Christi and discussed with item managers to determine if the items were bona fide mobilization items for the depot. We also matched FY 1989 peacetime requirements for depot maintenance of aviation items and the mobilization requirements by NSN to determine if mobilization requirements were computed for items planned to be repaired in peacetime.

We concluded that the data file used to determine mobilization requirements had not had a comprehensive update with FY 1989 requirements. Using AVSCOM's method of determining mobilization requirements, we identified 242 items (Appendix A), requiring about 418,000 direct labor hours, that were excluded and 6 items, requiring about 44,000 direct labor hours, that were erroneously included, which resulted in a net understatement of about 374,000 peacetime hours. The 374,000 hours would have to be adjusted by the appropriate surge factors to determine mobilization requirements.

Conclusion. The Army did not accurately determine mobilization requirements for the items managed by AVSCOM. The process could be significantly improved by automating the requirements computations, using the latest Defense Guidance, and using the applicable equipment surge factors. Without reliable requirements forecasts, the Army cannot properly plan for depot maintenance of combat systems and support equipment during mobilization.

#### RECOMMENDATIONS FOR CORRECTIVE ACTION

We recommend that the Assistant Secretary of the Army (Installations and Logistics) establish policy and procedures that provide for:

1. Automated computation of depot maintenance mobilization requirements annually using the most recent Defense Guidance.
2. Determining the mobilization requirements that use surge rate factors that coincide with the planned usage rates of specific equipment during mobilization.

## MANAGEMENT COMMENTS AND AUDIT RESPONSE

The Assistant Director for Maintenance Management, Office of the Deputy Chief of Staff for Logistics, Department of the Army, concurred with the Finding and Recommendations and stated that determining corrective actions would require more study than could be accomplished in the time available to reply to the draft report. Also, corrective actions were dependent on availability of funds for additional automation of the depot maintenance mobilization requirements computation. Therefore, we ask the Army to provide descriptions of corrective actions and estimated completion dates for planned actions in responding to the final report.

#### D. Source-of-Repair for New Systems

##### FINDING

The Military Departments did not fully document the results of the Decision Tree Analyses (DTA) performed to select sources-of-repair (SOR). The Army had not incorporated the DTA process into a formal regulation at the time of audit. These conditions occurred because the Military Departments' regulations did not provide definitive guidance on retention of documentation in support of SOR decisions. Failure to use a logical predefined process in making SOR decisions may result in the inefficient use of DoD maintenance resources. For example, the Army contracted life cycle repair of Mobile Subscriber Equipment and Fire Control Systems for the Apache helicopter. Recent studies show that Army depots could maintain the Target Acquisition Designation Sight (TADS) and the Pilot Night Vision Sensor (PNVS) for the Apache helicopter more cost-effectively than the contractors. The savings estimates range from \$12 million to \$147 million.

##### DISCUSSION OF DETAILS

Background. DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982, requires each Military Department to develop a DTA process for assigning SOR's (organic, inter-Service, and contractor depots) responsibilities for new systems. The Directive requires the DTA as an evaluation process to be applied by decision makers to determine the most efficient location where a system will be repaired. "Organic" maintenance is performed in Government facilities. "Inter-Service" maintenance is performed in one Military Department's organic facility in support of another Military Department. "Contract" maintenance is performed by a commercial source.

An effective DTA process begins with a concise definition of the total work load for the system. The analysis should match mission requirements and the availability of organic maintenance resources such as labor, facilities, and equipment to determine the desirability and feasibility of performing the work organically for peacetime and mobilization requirements. Contractor support should be considered as a SOR when it would improve peacetime readiness, troop combat sustainability, and the industrial base. Contractor support should also be considered when it is cost-effective.

In 1984, we audited the Military Departments' implementation of the DTA process. In that Report No. 84-123, "Survey Report on the Selection of Repair Sources," August 22, 1984, we reported that the Military Departments had not implemented the DTA process, as required by DoD Directive 4151.1. In response to that report, the Army initially planned to revise Army

Regulation 750-1, "Army Materiel Maintenance Concepts and Policies," December 1, 1983, to include guidance for their DTA process in determining SOR decisions. In November 1987, the Army Materiel Command issued a Letter of Instruction that defined the Army's SOR process. As of the time of the audit, the Army planned to incorporate the contents of this Letter of Instruction into Army Regulation 750-2, "Army Materiel and Maintenance Wholesale Operations." This Regulation was scheduled to be published during November 1989. The Navy issued Secretary of the Navy Instruction 4860.42, "Use of Contractor and DoD Resources for Maintenance of Materiel," on October 3, 1984, and the Air Force issued Air Force Regulation 66-7, "Depot Maintenance Posture Planning and Workload Management," on December 23, 1985, to implement their SOR processes.

Implementation of the DTA Process by the Army. We selected two communications/electronics systems and four aviation systems to evaluate the Army's implementation of the DTA process. The selected systems were the Mobile Subscriber Equipment (MSE), the Transportable Telephone Communications 39A systems, the Aviation Ground Power unit, the OH-58D, the TADS and PNVS systems for the Apache helicopter. We discussed the SOR decisions with responsible system program managers and reviewed available documentation in support of the decisions for these systems at the Communications-Electronics Command and the AVSCOM. According to the program manager, the SOR decisions for the Aviation Ground Power Unit were not derived from a DTA process. Program managers believed that the other systems were subjected to a DTA process, but were unable to provide documentation to support whether a formal DTA process had been used.

Based on available data for the SOR selection for the MSE and TADS and PNVS systems for the Apache helicopter, the Army's decision to contract life cycle maintenance support for the systems did not appear to be in the Government's best interest. The Army depends on foreign contractors for depot maintenance support for some of the TADS and PNVS systems even though they have been designated mission essential to its tactical operations. Also, DESCOM studies indicate that organic repair for life cycle support of the TADS and PNVS systems would cost \$147.5 million less than the planned contractor support. The Army Audit Agency estimated the savings would be between \$12 million and \$49 million. The Army's studies consistently stated that significant savings were available if the Army organically performed maintenance of this mission essential system. The Army is revalidating its decision.

Implementation of the DTA Process by the Navy. The Navy had established formal DTA procedures. The guidelines were in Instruction 4860.42. We requested data on 40 new systems that had been introduced between October 1985 and August 1989. We were told the analyses had been done; however, the Navy was unable to provide the documentation of these analyses. Navy personnel indicated the records had been misplaced during a 1986 reorganization. Due to the lack of documentation, we were unable to review the Navy's implementation of the DTA process.

Implementation of the DTA Process by the Air Force. The Air Force had implemented a formal DTA process. The guidelines of the process were in Air Force Regulation 66-7. We requested DTA's on the new systems introduced since FY 1986. The Air Force provided Air Force Logistics Command Form 137, "Depot Maintenance Source of Repair Decision Tree Analysis," for 16 new systems. The DTA's were summarized on the Form 137. Although the Form contained summary data, such as capital investment cost estimates, we were unable to obtain the data to support these numbers. The Air Force had not retained full documentation to support the summaries on the Form 137.

Conclusions. The Army had not fully implemented the DTA process required by DoD Directive 4151.1. None of the Military Departments required the retention of documentation on which the SOR decisions were based. Because of the magnitude of the life cycle maintenance cost of today's weapon systems, it is imperative that DoD managers follow a logical, predefined, and well documented DTA process in making SOR decisions.

#### RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Assistant Secretary of the Army (Installations and Logistics) complete the revision of Army Regulation 750-2, "Army Materiel and Maintenance Wholesale Operations," to include detailed Decision Tree Analysis procedures for selecting a source-of-repair.

2. We recommend that the Assistant Secretary of the Army (Installations and Logistics), the Assistant Secretary of the Navy (Research, Development and Acquisition), and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics) identify documentation to be retained in support of source-of-repair decisions and include these requirements in the respective Military Departments' regulations that implement DoD Directive 4151.1, "Use of Contractor and DoD Resources for the Maintenance of Materiel."

## MANAGEMENT COMMENTS AND AUDIT RESPONSE

The Assistant Director for Maintenance Management, Office of the Deputy Chief of Staff for Logistics, Department of the Army, concurred with the Finding and Recommendations and stated that the Recommendations were incorporated into Army Regulation 750-2, October 27, 1989. We verified that provisions of Recommendation D.1. were in the Regulation, but the Recommendation D.2. requirement for identifying pertinent documentation to be retained in support of repair decisions was omitted. We request that the Army reconsider its position regarding corrective actions for Recommendation D.2., and provide corrective actions and estimated completion dates for planned actions in responding to the final report.

The Assistant Secretary of the Navy (Research, Development and Acquisition) concurred with the Finding and Recommendation D.2. and planned actions are responsive to the recommendation. Additional comments on the final report are not required.

The Deputy Assistant Secretary of the Air Force (Logistics), Department of the Air Force, concurred with the Finding and Recommendation D.2. and planned actions are responsive to the Recommendation. Additional comments on the final report are not required. The Air Force also advised that DoD Directive 4151.1 defined DTA differently than we did in the draft report. We have revised the Finding Background paragraph to state that the Directive requires the DTA process.

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>     | <u>Quantity</u> | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|-------------------------|-----------------|-----------------------------------|
| 1520-00-871-7308                 | CH-47C Helicopter       | 2               | 964                               |
| 1520-00-990-2941                 | CH-47B Helicopter       | 1               | 901                               |
| 1520-01-035-0266                 | UH-60A Helicopter       | 8               | 21,712                            |
| 1520-01-088-3669                 | CH-47D Helicopter       | 7               | 19,860                            |
| 1520-01-125-5476                 | CH-58D Helicopter       | 60              | 35,054                            |
| 2840-00-176-9132                 | T-53-L701 Engine        | 39              | 18,147                            |
| 1520-00-TAH-0001                 | TAH-1S Conversion Kit   | 10              | 4,220                             |
| 1520-00-000-0006                 | Fuel System Extension   | 1               | 81                                |
| 1520-00-000-0009                 | Cables Ground Crew      | 150             | 453                               |
| 1560-00-000-0020                 | AH-1F Hot Mock-up       | 4               | 24,560                            |
| 1560-00-034-3743                 | Shroud Assembly Engine  | 25              | 563                               |
| 1560-00-065-0674                 | Tab Trim Aileron        | 26              | 169                               |
| 1560-00-114-1276                 | Elevator Assembly       | 3               | 125                               |
| 1560-00-117-2947                 | Pod Assembly Fuselage   | 6               | 462                               |
| 1560-00-117-3085                 | Pod Assembly Fuselage   | 2               | 154                               |
| 1560-00-117-3199                 | Pod Assembly Fuselage   | 3               | 285                               |
| 1560-00-126-9148                 | Stabilizer Horizontal   | 20              | 280                               |
| 1560-00-179-4052                 | Stabilizer Vertical     | 103             | 1,222                             |
| 1560-00-179-6229                 | Fairing Assembly Pylon  | 8               | 298                               |
| 1560-00-238-4775                 | Fairing Pylon Aircraft  | 6               | 204                               |
| 1560-00-238-4776                 | Fairing Assembly Center | 5               | 170                               |
| 1560-00-241-5308                 | Flap Assembly Control   | 28              | 1,436                             |
| 1560-00-241-5336                 | Absorber Dynamic        | 15              | 1,006                             |
| 1560-00-433-7333                 | Latch Assembly Upload   | 2               | 1,074                             |
| 1560-00-557-8438                 | Elevator Assembly       | 5               | 110                               |
| 1560-00-828-3308                 | Pod Assembly Aircraft   | 3               | 279                               |
| 1560-00-922-2719                 | Support Assembly        | 9               | 64                                |
| 1560-00-927-5781                 | Horn Assembly           | 38              | 57                                |
| 1560-00-966-7517                 | Horn Elevator           | 9               | 23                                |
| 1560-01-000-1198                 | Extended Range System   | 149             | 28,896                            |
| 1560-01-012-5788                 | Link Assembly Lift      | 11              | 85                                |
| 1560-01-016-5484                 | Panel Engine            | 20              | 360                               |
| 1560-01-038-2403                 | Fairing Tail Pipe       | 1               | 20                                |
| 1560-01-044-6054                 | Door Assembly Pilot     | 31              | 2,351                             |

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS (Continued)**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>         | <u>Quantity</u> | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|-----------------------------|-----------------|-----------------------------------|
| 1560-01-048-4882                 | Rack External               | 32              | 596                               |
| 1560-01-064-4923                 | Leading Edge                | 45              | 1,148                             |
| 1560-01-078-5725                 | Input Assembly              | 16              | 85                                |
| 1560-01-078-5726                 | Input Power Assembly        | 15              | 113                               |
| 1560-01-081-9253                 | Fitting Stabilizer          | 54              | 513                               |
| 1560-01-082-9202                 | Blade Fold Set              | 50              | 10,513                            |
| 1560-01-082-9238                 | Linear Pitch                | 38              | 143                               |
| 1560-01-088-3215                 | Cowling Kit                 | 15              | 3,587                             |
| 1560-01-101-9746                 | Servo YAW Trim              | 90              | 1,170                             |
| 1560-01-105-5780                 | Pod Assembly Fuel Right     | 12              | 1,260                             |
| 1560-01-106-1905                 | Module Assembly Pilot       | 89              | 1,013                             |
| 1560-01-120-4137                 | Exhaust Assembly Left Hand  | 19              | 333                               |
| 1560-01-125-0795                 | Stabilizer Assembly         | 10              | 435                               |
| 1560-01-125-9900                 | Valve Direction             | 6               | 29                                |
| 1560-01-127-0061                 | Exhaust Assembly Right Hand | 25              | 413                               |
| 1560-01-127-7387                 | Inlet Assembly Engine       | 29              | 6,954                             |
| 1560-01-192-2456                 | Pod Assembly                | 4               | 364                               |
| 1560-01-192-2457                 | Pod Assembly                | 4               | 372                               |
| 1560-01-192-2459                 | Pod Assembly                | 4               | 308                               |
| 1560-01-214-0203                 | Tail Boom Assembly          | 19              | 1,173                             |
| 1560-01-221-7600                 | Installation Kit            | 4               | 1,411                             |
| 1610-00-405-4630                 | After Body and Door         | 10              | 75                                |
| 1615-00-069-3327                 | Coupling Main Drive         | 708             | 991                               |
| 1615-00-078-2772                 | Level Assembly              | 27              | 69                                |
| 1615-00-183-0834                 | Transmission Assembly       | 456             | 45,358                            |
| 1615-00-213-7261                 | Hub Assembly Rotary         | 1               | 73                                |
| 1615-00-759-8321                 | Piston Assembly             | 57              | 499                               |
| 1615-00-918-2676                 | Gear Box 42 Degree          | 331             | 7,873                             |
| 1615-00-996-7491                 | Case Assembly Transmission  | 35              | 438                               |
| 1615-01-074-5151                 | Extension Assembly          | 17              | 374                               |
| 1615-01-074-5152                 | Gear Box                    | 5               | 100                               |
| 1615-01-074-5153                 | Plate Assembly              | 16              | 160                               |
| 1615-01-078-5724                 | Main Transmission           | 45              | 7,565                             |
| 1615-01-089-0465                 | Axial Fan                   | 8               | 52                                |
| 1615-01-095-7363                 | Pressure Plate              | 11              | 77                                |
| 1615-01-105-1509                 | Bracket Assembly Damper     | 40              | 460                               |
| 1615-01-105-1510                 | Tail Gear Box               | 4               | 166                               |
| 1615-01-105-8713                 | Gear Box Assembly Main      | 1               | 221                               |
| 1615-01-106-1903                 | Main Rotor Blade            | 70              | 2,380                             |
| 1615-01-112-2978                 | Cooler Combination          | 2               | 10                                |
| 1615-01-112-2979                 | Cooler Right Hand           | 4               | 20                                |
| 1615-01-112-2980                 | Cooler Left Hand            | 10              | 60                                |

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS (Continued)**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>          | <u>Quantity</u> | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|------------------------------|-----------------|-----------------------------------|
| 1615-01-112-5895                 | Shaft Assembly Drive         | 34              | 323                               |
| 1615-01-112-5900                 | Cooler Assembly              | 4               | 22                                |
| 1615-01-113-0217                 | Cooler Assembly Transmission | 4               | 23                                |
| 1615-01-113-0223                 | Diffuser Transmission        | 4               | 80                                |
| 1615-01-113-0248                 | Shaft Assembly Drive         | 6               | 130                               |
| 1615-01-113-0292                 | Shaft Assembly Drive         | 6               | 52                                |
| 1615-01-113-0460                 | Heavy Rotary Wing            | 54              | 11,312                            |
| 1615-01-115-3610                 | Swash Plate Control          | 17              | 467                               |
| 1615-01-115-3623                 | Swash Plate Forward          | 11              | 327                               |
| 1615-01-115-3624                 | Ring Assembly Swash          | 2               | 15                                |
| 1615-01-116-2958                 | Impeller Fan Axial           | 4               | 15                                |
| 1615-01-116-4185                 | Plate Pressure               | 4               | 138                               |
| 1615-01-119-3359                 | Shaft Assembly Drive         | 9               | 96                                |
| 1615-01-119-3361                 | Shaft Assembly Rotor         | 11              | 913                               |
| 1615-01-127-2166                 | Weight Assembly Bufil        | 6               | 17                                |
| 1615-01-127-7388                 | Bifilarrod End               | 11              | 140                               |
| 1615-01-128-1749                 | Gear Box Assembly Main       | 2               | 222                               |
| 1615-01-128-4399                 | Tail Rotor Assembly          | 176             | 7,296                             |
| 1615-01-131-2877                 | Blade Rotary Wing            | 3               | 74                                |
| 1615-01-134-8362                 | Plate Pressure               | 16              | 304                               |
| 1615-01-145-3928                 | Main Gear Box Assembly       | 40              | 10,310                            |
| 1615-01-145-7109                 | Fiberglass Blade Forward     | 60              | 5,700                             |
| 1615-01-145-7110                 | Fiberglass Blade Aft         | 51              | 4,845                             |
| 1615-01-146-5259                 | Damper Assembly Main         | 36              | 1,028                             |
| 1615-01-151-9233                 | Blade Rotary Wing            | 3               | 80                                |
| 1615-01-168-2983                 | Gear Box Main                | 14              | 3,569                             |
| 1615-01-177-5862                 | Blade Rotary Wing            | 4               | 106                               |
| 1615-01-198-7555                 | Rotor Head Forward           | 6               | 1,159                             |
| 1615-01-199-1814                 | Rotor Head Aft               | 6               | 1,105                             |
| 1615-01-208-0710                 | Support Assembly             | 8               | 20                                |
| 1615-01-214-9167                 | Gear Box Assembly            | 45              | 1,407                             |
| 1615-01-244-4971                 | Transmission Rotor           | 14              | 490                               |
| 1620-00-106-0034                 | Cross Tube Assembly          | 76              | 646                               |
| 1620-00-181-4329                 | Landing Gear Retractable     | 10              | 873                               |
| 1620-01-083-3602                 | Electric Actuator            | 260             | 1,144                             |
| 1620-01-095-6992                 | Fork Landing Gear            | 110             | 746                               |
| 1620-01-096-5573                 | Landing Gear Fixed           | 20              | 158                               |
| 1630-00-056-2329                 | Cylinder Hydraulic           | 27              | 135                               |
| 1630-00-065-7574                 | Valve Linear Direct          | 90              | 837                               |
| 1630-00-247-0251                 | Skid Tube                    | 105             | 945                               |
| 1630-01-089-2850                 | Brake Multiple Disk          | 151             | 1,481                             |
| 1650-00-133-6936                 | Cylinder Assembly            | 27              | 257                               |

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS (Continued)**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>         | <u>Quantity</u> | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|-----------------------------|-----------------|-----------------------------------|
| 1650-00-794-2550                 | Manifold Hydraulic          | 10              | 96                                |
| 1650-00-922-5846                 | Servo Cylinder              | 12              | 48                                |
| 1650-01-059-6006                 | Hydraulic Unit              | 44              | 158                               |
| 1650-01-106-1957                 | Actuator Assembly           | 5               | 135                               |
| 1650-01-115-3817                 | Valve Solenoid              | 2               | 10                                |
| 1650-01-117-1222                 | Detector Ice                | 5               | 9                                 |
| 1650-01-119-7369                 | Hydraulic Extender          | 4               | 36                                |
| 1650-01-120-7512                 | Reservoir Cooler            | 4               | 47                                |
| 1650-01-125-5430                 | Servo Assembly Tail         | 12              | 252                               |
| 1650-01-151-1713                 | Servo Cylinder              | 26              | 702                               |
| 1650-01-151-5459                 | Servo Cylinder              | 36              | 990                               |
| 1650-01-151-9231                 | Servo Cylinder              | 47              | 1,269                             |
| 1650-01-222-8087                 | Cylinder Assembly           | 48              | 1.104                             |
| 1660-00-101-6860                 | Valve Hot Air               | 13              | 85                                |
| 1660-00-132-1038                 | Mixing Valve Remote         | 67              | 436                               |
| 1660-00-872-1719                 | Valve                       | 175             | 1,757                             |
| 1660-01-115-3636                 | Control Assembly            | 16              | 112                               |
| 1680-00-159-9002                 | Actuator Electro Mechanical | 314             | 3,406                             |
| 1680-00-168-5427                 | Printed Circuit             | 31              | 264                               |
| 1680-00-179-1100                 | Cylinder Actuator           | 234             | 2,340                             |
| 1680-00-443-1137                 | Actuator Electro Mechanical | 3               | 36                                |
| 1680-00-443-1138                 | Actuator Electro Mechanical | 11              | 132                               |
| 1680-00-567-0477                 | Circuit Card Assembly       | 13              | 53                                |
| 1680-00-871-8736                 | Quill Assembly Transmission | 32              | 396                               |
| 1680-01-058-3671                 | High Performance Hoist      | 13              | 580                               |
| 1680-01-088-3668                 | Annunciator Panel           | 53              | 281                               |
| 1680-01-090-6517                 | Control Unit Windshield     | 24              | 324                               |
| 1680-01-092-7980                 | Yoke and Housing            | 9               | 63                                |
| 1680-01-092-7981                 | Yoke and Housing            | 11              | 77                                |
| 1680-01-095-7300                 | Air Transport Set           | 100             | 21,240                            |
| 1680-01-095-7314                 | Control Box Electrical      | 4               | 12                                |
| 1680-01-105-1461                 | Servo Flight Control        | 3               | 583                               |
| 1680-01-117-1331                 | Actuator Electric           | 42              | 1,160                             |
| 1680-01-117-1332                 | Actuator Electro Mechanical | 35              | 213                               |
| 1680-01-118-5556                 | Brake Electro Mechanical    | 9               | 108                               |
| 1680-01-118-5605                 | Electric Actuator           | 21              | 402                               |
| 1680-01-120-7641                 | Electric Actuator           | 29              | 388                               |
| 1680-01-123-7643                 | Signal Processor            | 7               | 63                                |
| 1680-01-183-4852                 | Control Box                 | 100             | 810                               |
| 1680-01-224-6666                 | Actuator Thrust             | 7               | 102                               |
| 2835-01-123-7648                 | Shaft Assembly              | 21              | 158                               |
| 2840-00-118-5707                 | Parts Kit Torqueme          | 23              | 529                               |

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS (Continued)**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>      | <u>Quantity</u> | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|--------------------------|-----------------|-----------------------------------|
| 2840-00-131-6410                 | Duct Exhaust Turbine     | 40              | 120                               |
| 2840-00-242-4472                 | Compressor Rotor         | 50              | 188                               |
| 2840-00-485-0595                 | Nozzle Turbine           | 40              | 440                               |
| 2840-00-485-9751                 | Tank Lubricating         | 27              | 215                               |
| 2840-00-587-3622                 | Housing Gear Box         | 128             | 269                               |
| 2840-00-779-3612                 | Cover Assembly           | 49              | 421                               |
| 2840-00-975-0248                 | Starter Drive Assembly   | 22              | 116                               |
| 2840-00-975-0253                 | Housing Assembly Inlet   | 12              | 98                                |
| 2840-01-037-9347                 | Case and Vane Assembly   | 29              | 496                               |
| 2840-01-089-4291                 | Nozzle Turbine           | 38              | 798                               |
| 2840-01-121-0751                 | Cold Section Module      | 3               | 516                               |
| 2840-01-121-0752                 | Power Turbine Module     | 17              | 2,593                             |
| 2840-01-121-0753                 | Accessory Module         | 6               | 473                               |
| 2840-01-135-0107                 | Gear Box Assembly        | 7               | 179                               |
| 2840-01-137-5812                 | Turbine Rotor            | 10              | 100                               |
| 2840-01-137-5820                 | Nozzle Turbine           | 10              | 145                               |
| 2840-01-143-9991                 | Frame Swirl Partical     | 2               | 16                                |
| 2840-01-193-3349                 | Nozzle Turbine           | 1               | 14                                |
| 2840-01-247-2569                 | Turbine Rotor            | 27              | 500                               |
| 2915-00-072-5082                 | Pump Submerged Aircraft  | 29              | 483                               |
| 2915-00-922-2754                 | Valve Gate Aircraft      | 47              | 141                               |
| 2915-01-070-5675                 | Pump Assembly Fuel       | 21              | 209                               |
| 2915-01-100-5556                 | Pump Fuel Boost          | 16              | 102                               |
| 2915-01-102-6019                 | Electric Prime Pump      | 5               | 73                                |
| 2915-01-150-2933                 | Valve                    | 60              | 1,556                             |
| 2915-01-151-9220                 | Governor Assembly        | 99              | 1,448                             |
| 2915-01-162-9543                 | Fuel Control             | 195             | 7,299                             |
| 2915-01-169-2563                 | Fuel Control Main        | 28              | 2,394                             |
| 2915-01-171-3973                 | Fuel Control Main        | 21              | 1,701                             |
| 2925-00-470-4401                 | Starter-Generator        | 69              | 570                               |
| 2925-01-121-0755                 | Control Unit Electrical  | 18              | 522                               |
| 2925-01-161-1455                 | Control Unit Electrical  | 1               | 40                                |
| 2925-01-181-3971                 | Control Unit Electrical  | 64              | 2,567                             |
| 2935-00-176-3907                 | Cooler Lubricant         | 26              | 139                               |
| 2945-00-109-2364                 | Particle Separator       | 23              | 253                               |
| 2995-01-008-7763                 | Actuator Assembly        | 86              | 416                               |
| 2995-01-072-5918                 | Starter Engine Hydraulic | 22              | 383                               |
| 2995-01-076-7732                 | Starter Engine Hydraulic | 81              | 2,525                             |
| 2995-01-079-9316                 | Hydraulic Starter        | 10              | 145                               |
| 2995-01-134-7264                 | Anti-Ice Valve           | 99              | 1,841                             |
| 3040-00-004-1005                 | Connecting Link          | 10              | 45                                |
| 3040-00-122-1780                 | Connecting Link          | 27              | 135                               |

**PEACETIME REQUIREMENTS EXCLUDED FROM FY 1989 MOBILIZATION  
REQUIREMENTS FOR DEPOT MAINTENANCE OF AVIATION ITEMS (Continued)**

| <u>National Stock<br/>Number</u> | <u>Nomenclature</u>           | <u>Quantity</u>      | <u>Direct<br/>Labor<br/>Hours</u> |
|----------------------------------|-------------------------------|----------------------|-----------------------------------|
| 3040-01-110-1870                 | Connecting Link               | 7                    | 154                               |
| 3040-01-244-6423                 | Connecting Link               | 285                  | 1,568                             |
| 3110-00-052-0392                 | Bearing Roller                | 12                   | 13                                |
| 3110-00-727-3032                 | Bearing Ball                  | 77                   | 85                                |
| 4140-01-115-3697                 | Fan Vane Axial                | 4                    | 24                                |
| 4320-00-400-7382                 | Pump                          | 25                   | 308                               |
| 4320-00-795-9852                 | Pump Rotary                   | 108                  | 1,404                             |
| 4320-01-096-1446                 | Reservoir Fill Hydraulic Pump | 10                   | 43                                |
| 4810-01-096-1055                 | Valve Hydraulic               | 5                    | 20                                |
| 4810-01-096-1056                 | Valve Hydraulic               | 16                   | 40                                |
| 4810-01-102-2473                 | Start Control Valve           | 21                   | 198                               |
| 4810-01-120-0196                 | Valve Solenoid                | 24                   | 205                               |
| 4820-00-134-4457                 | Valve Air Condition           | 12                   | 120                               |
| 5340-00-839-3934                 | Clevis                        | 95                   | 320                               |
| 5821-01-183-4852                 | Control Box                   | 83                   | 664                               |
| 6115-00-973-1223                 | Generator Deicer              | 51                   | 602                               |
| 6115-01-054-5222                 | Control Unit Alternator       | 56                   | 684                               |
| 6115-01-146-1617                 | Generator Alternator          | 27                   | 354                               |
| 6130-00-059-3404                 | Power Supply                  | 40                   | 429                               |
| 6220-01-105-6582                 | Retract Land Light            | 92                   | 843                               |
| 6340-01-039-2894                 | Box Low RPM Warning           | 251                  | 1,706                             |
| 6340-01-112-8914                 | Box Warning Control           | 77                   | 431                               |
| 6340-01-153-8073                 | Box Warning Control           | 71                   | 294                               |
| 6610-00-160-0856                 | Indicator Altitude            | 101                  | 1,223                             |
| 6610-00-160-0233                 | Indicator Vertical            | 90                   | 630                               |
| 6610-01-029-6703                 | Indicator Vertical            | 42                   | 378                               |
| 6610-01-034-4765                 | Indicator                     | 50                   | 310                               |
| 6610-01-098-8363                 | Indicator Air Speed           | 150                  | 1,575                             |
| 6610-01-099-6292                 | Indicator Altitude            | 100                  | 1,232                             |
| 6610-01-100-8128                 | Indicator Vertical Velocity   | 84                   | 714                               |
| 6620-01-082-9249                 | Panel Front Subassembly       | 3                    | 7                                 |
| 6680-00-868-9810                 | Indicator Liquid Quantity     | 10                   | 59                                |
| 6680-01-081-9181                 | Indicator Electrical          | 40                   | 720                               |
| 6680-01-123-7726                 | Transmitter Liquid            | 6                    | 78                                |
| 6680-01-123-7727                 | Indicator Liquid              | 6                    | 51                                |
| 6680-01-123-7728                 | Indicator Liquid              | 4                    | 34                                |
| 6680-01-127-2481                 | Electric Tachometer           | 30                   | 270                               |
| 6680-01-137-5709                 | Transmission Liquid           | 10                   | 90                                |
| 6685-00-090-8912                 | Indicator Assembly            | 58                   | 232                               |
| 6685-01-036-6894                 | Indicator Electric            | 139                  | 2,236                             |
| <b>Totals</b>                    |                               | <b><u>10,417</u></b> | <b><u>417,604</u></b>             |



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF FOR LOGISTICS  
WASHINGTON, DC 20310-0500



30 MAR 1990

DALO-SMM 9000114L

COL MCCOY/EXECUTIVE/79039 *for Robert A. Shirley, Col, GS*

MEMORANDUM THRU ~~DEPUTY CHIEF OF STAFF FOR LOGISTICS~~ *WILLIAM J. DANIELS,*  
~~DIRECTOR OF THE ARMY STAFF~~ *LTC, GS, ADAS*  
~~ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS,~~ *2 500 100*  
~~LOGISTICS AND ENVIRONMENT)~~ *4/4/90*

FOR ASSISTANT INSPECTOR GENERAL FOR FOLLOWUP, DEPARTMENT OF DEFENSE *Eric A. Crist*  
*Assistant Secretary*  
*Logistics*

SUBJECT: Report on the Audit of Depot Maintenance Work Load Management (Project No. 9SA-0013)--INFORMATION MEMORANDUM

1. This replies to your memorandum, 9 February 1990, subject as above (Tab A).
2. Generally concur with the recommendations and findings contained in the report. Detailed comments on each recommendation and finding are at Tab B.

2 Encls

*William P. Neal*  
JACKSON E. ROZIER, JR.  
Major General, GS  
Director of Supply  
and Maintenance  
*WILLIAM P. NEAL*  
Assistant Director for  
Maintenance Management

CF: SAIG-PA

Mr. Maxfield/54151



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-2884

February 6, 1990

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (PRODUCTION AND LOGISTICS)  
ASSISTANT SECRETARY OF THE ARMY (FINANCIAL MANAGEMENT)  
ASSISTANT SECRETARY OF THE NAVY (FINANCIAL MANAGEMENT)  
ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Report on the Audit of Depot Maintenance Work Load Management (Project No. 9SA-0013)

We are providing this draft report on the Audit of Depot Maintenance Work Load Management for your review and comments. The audit was made from November 1988 through September 1989. The primary audit objective was to evaluate the effectiveness of the management of the depot maintenance work load. We concentrated our audit on the procedures for source selection for repairs, the procedures for assigning mobilization work load to the depots, and the procedures for developing realistic and achievable depot maintenance mobilization plans. We also evaluated applicable internal controls. DoD plans to spend about \$13 billion for depot maintenance during FY 1990.

The Military Departments had made significant improvements in depot maintenance mobilization planning; however, additional improvements were needed. The results of the audit are summarized in the following paragraphs, and the details and audit recommendations are in Part II of this report.

The Military Departments' mobilization plans were not in compliance with the procedures established by DoD Directive 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982. The DoD maintenance activities' ability to meet mobilization requirements was questionable. The audit identified approximately 740,000 hours of work load assigned to depots that exceeded the 250 percent guidelines in DoD Directive 4151.1. We recommended that the Military Departments comply with the policy contained in DoD Directive 4151.1 (page 7).

The Army National Guard's Aviation Classification and Repair Depot at Fresno, California, did not have the capability to perform about 149,000 direct labor hours of assigned mobilization work load for the regular Army. We recommended that the Assistant Secretary of the Army (Installations and Logistics) and

actions. If you nonconcur, please state your specific reasons. If appropriate, you may propose alternative methods for accomplishing desired improvements. This report identifies no potential monetary benefits. A summary of the other benefits resulting from this audit is in Appendix B. In order for your comments to be included in the final report, they must be received within 60 days of the date of this memorandum.

The courtesies and cooperation extended to the staff during the audit are appreciated. If you desire to discuss the results of the audit, you may request a formal exit conference within 15 days of the date of this draft report. If you have any questions on this audit, please contact Mr. Thomas F. Gimble on (202) 694-6227 (AUTOVON 224-6227) or Mr. Charles E. Sanders on (202) 694-6219 (AUTOVON 224-6219). Copies of the final report will be distributed to the non-DoD activities shown in Appendix D. Copies of this draft report are being provided to the activities listed in Appendix E.



Donald E. Reed  
Director  
Logistic Support Directorate

Enclosure . / 3 3

cc:  
Secretary of the Army  
Secretary of the Navy  
Secretary of the Air Force

A. Planning for Organic Depot Maintenance Mobilization Requirements

(Following changes recommended to finding)

Reference pages 10 and 13 - Mobilization workload at Corpus Christi Army Depot (CCAD) should be 6.9 million direct labor hours, not 6.0 million shown in draft report. 6 and 8

Reference page 13 - The number 2,446 direct labor hours per position is incorrect, it should be 2,466. 8

Reference pages 13 and 14 - CCAD states that consideration should be given to the fact that peacetime and mobilization TDAs are reviewed and the differences evaluated for mobilization requirements. During each review, CCAD has made a detailed analysis which compared additional mobilization needs to skills available in the local labor market. The review considered not only additional manpower required by the mobilization TDA, but replacement of probable loss due to reserve call-up, retired military activation, and draft eligibles as well. Manpower requirements have been prepositioned with the local state employment office. The depot's mobilization plan includes both recruiting from the private sector and promotion of on-board personnel. Where possible, qualified personnel in the private sector with desired skills would be employed at the level for which qualified. Most of these would be the more common mechanical and support fields. Experience has shown that, except for depot retirees and former employees, candidates with aircraft or aircraft related skills are in very short supply. Thus the majority of additional journeyman and intermediate requirements will have to be met by promoting on-board personnel. 8

(Recommendations for Corrective Actions from the draft report are underlined.)

1. (Recommendation applicable to Navy and Air Force.)

2. We recommend that the Assistant Secretary of the Army (Installation and Logistics), the Assistant Secretary of the Navy (Shipbuilding and Logistics), and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics):

a. Require that mobilization planning be accomplished at the production shop level.

Concur. Depot System Command (DESCOM) has initiated action to issue guidance to CCAD which will enable CCAD to satisfy the recommendation.

b. Require depots to include in their annual mobilization plans for personnel augmentation

(1) The number of anticipated new hires for each production shop by job series and skill level.

Concur. The number of anticipated new hires for each production shop by job series and skill level have been identified and are on file.

(2) Potential sources for new hires by job series and skill level

Concur. Potential sources for new hires by job series and skill level have been identified and are on file.

(3) Procedures for training and integration of new hires with peacetime labor forces during mobilization.

Concur. Procedures for training and integration of new hires with peacetime labor forces during mobilization are in place.

(4) Identify secondary skills for onboard personnel and their planned use during mobilization.

Concur in part. During mobilization, the mission of CCAD does not change. The mobilization TDA and Plan eliminate small organizations with a combined total fewer than 25 personnel. Identification of secondary skills of these personnel in conjunction with planned use of those skills during mobilization is practical. The identification of secondary skills of all depot employees is not. It would be very costly and serve little or no purpose. With the exception of the few employees noted above, all personnel would remain in their present skill at the current or higher grade level.

3. Use of Army National Guard Units During Mobilization

We recommend that the Assistant Secretary of the Army (Installations and Logistics) and Chief of the Army National Guard Bureau upgrade the capability of the Aviation Classification and Repair Depots (AVCRAD) to accomplish mobilization work load or determine alternate sources of repair for the mobilization work load.

Concur. The capability of the AVCRADs needs to be upgraded through training and updated support equipment to meet mobilization workload assignments. The Aviation Logistics Office of the Office of the Deputy Chief of Staff for Logistics will arrange a meeting of the interested activities and develop a schedule to meet mobilization

support program needs, to aid in future workload assignments or revisions.

C. Army Depot Maintenance Mobilization Requirements

We recommend that the Assistant Secretary of the Army (Installations and Logistics) establish policy and procedures that provide for:

1. Automated computation of depot maintenance mobilization requirements annually using the most recent Defense Guidance.

2. Determining the mobilization requirements that use surge rate factors that coincide with the planned usage rates of specific equipment during mobilization.

Concur. Subject to the availability of funds for additional automation. The implications of this requires more study than could be accomplished in the time available to reply to the draft report.

D. Source of Repair for New Systems

1. We recommend that the Assistant Secretary of the Army (Installations and Logistics), complete the revision of Army Regulation 750-2, "Army Materiel and Maintenance Wholesale Operations," to include detailed Decision Trees Analysis procedures for selecting a source of repair.

Concur. AR 750-2 was published with effective date of 27 October 1989.

2. We recommend that the Assistant Secretary of the Army (Installations and Logistics), the Assistant Secretary of the Navy (Shipbuilding and Logistics), and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics) identify documentation to be retained in support of source of repair decisions and include these requirement in the respective Military Departments' regulations that implement DoD Directive 4151.1, "Use of Contractor and DoD Resources for the Maintenance of Materiel."

Concur. AR 750-2 was published with effective date of 27 October 1989.



THE ASSISTANT SECRETARY OF THE NAVY  
(Research, Development and Acquisition)  
WASHINGTON, D.C. 20350-1000

MAY 03 1990

MEMORANDUM FOR DEPARTMENT OF DEFENSE ASSISTANT INSPECTOR GENERAL  
FOR AUDITING

Subj: DRAFT REPORT ON THE AUDIT OF DEPOT MAINTENANCE WORK LOAD  
MANAGEMENT (PROJECT NO. 9SA-0013) - INFORMATION

After reviewing the Audit of Depot Maintenance Work Load  
Management, I concur with the draft report.

The Naval Air Systems Command (AIR-43) will formally issue  
guidance to ensure proper mobilization planning including  
personnel augmentation by 1 March 1991.

Decision tree analysis has been established in SECNAV  
Instruction 4860.42. The Naval Air systems Command (AIR-43) has  
reemphasized proper documentation retention among all concerned  
and will formally issue guidance for specific DTA documentation  
retention requirements by 1 April 1991.

  
Gerald A. Cann

Copy to:  
NAVINSGEN  
NAVCOMPT (NCG-53)





DEPARTMENT OF THE AIR FORCE  
WASHINGTON, D.C. 20330-1000

OFFICE OF THE ASSISTANT SECRETARY

05 APR 1990

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING  
OFFICE OF THE INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE

SUBJECT: DoD(IG) Draft Report, Depot Maintenance Work Load  
Management (Project No. 9SA-0013) - INFORMATION  
MEMORANDUM

This is in reply to your memorandum for the Assistant  
Secretary of the Air Force (Financial Management and Comptroller)  
requesting comments on the findings and ~~recommendations~~ made in  
subject report.

A handwritten signature in black ink, appearing to read "Lloyd K. Mosemann, II", with a large, sweeping flourish underneath.

LLOYD K. MOSEMANN, II  
Deputy Assistant Secretary  
(Logistics)

- 2 Attachments  
1. Management Actions  
2. General Comments

Draft Report of Audit, Depot Maintenance Work Load Management  
(Project No. 9SA-0013)

RECOMMENDATION A.1. We recommend that the Assistant Secretary of the Navy (Shipbuilding and Logistics) and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations and Logistics) direct the maintenance activities to comply with the requirements of DoD Instruction 4151.1, "Use of Contractor and DoD Resources for Maintenance of Materiel," July 15, 1982, as it relates to capacity determination.

MANAGEMENT ACTIONS

Concur with intent. The Centers have been tasked to update their capacity data and submit their G004K capacity data reports as required in AFLCR 66-4, Chapter 5. HQ AFLC/MAW is amending AFLCR 66-48 to include capacity determination. ECD: June 1990. Implementation of the Depot Sizing Model at each Center will provide a less labor intensive vehicle for maintaining and updating the capacity data. ECD: October 1990.

RECOMMENDATION A.2. We recommend that the Assistant Secretary of the Army (Installations and Logistics), the Assistant Secretary of the Navy (Shipbuilding and Logistics), and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics):

a. Require that mobilization planning be accomplished at the production shop level.

b. Require depots to include in their annual mobilization plans for personnel augmentation:

(1) The number of anticipated new hires for each production shop by job series and skill level.

(2) Potential sources for new hires by job series and skill level.

(3) Procedures for training and integration of new hires with peacetime labor forces during mobilization.

(4) Identify secondary skills for on board personnel and their planned use during mobilization.

MANAGEMENT ACTIONS

a. Concur with intent. Mobilization planning is accomplished at the production shop level.

b. Concur with intent. Recommended actions are in place. Current workforce augmentation plans require the identification of potential sources for new hires. Existing new employee training plans are sufficiently detailed to provide training requirements. Secondary skills for on board personnel are identified in the Depot Sizing Model, which provides a skills transfer matrix to tailor the movement of on board personnel to individual mobilization scenarios as well as predict anticipated new hires for each production shop by skill code. Estimated completion date for implementation of the Depot Sizing Model at the Centers is October 1990.

RECOMMENDATION D.2. We recommend that the Assistant Secretary of the Army (Installations and Logistics), and the Assistant Secretary of the Navy (Shipbuilding and Logistics), and the Assistant Secretary of the Air Force (Manpower, Reserve Affairs, Installations, and Logistics) identify documentation to be retained in support of source of repair decisions and include these requirements in the respective Military Departments' regulations that implement DoD Directive 4151.1, "use of Contractor and DoD Resources for the Maintenance of Materiel."

#### MANAGEMENT ACTIONS

Concur as written. Documentation to be retained as a part of the Decision Tree Analysis (DTA) package has been identified to provide an audit trail of all source of repair decisions. HQ AFLC will amend AFLCR 66-48 to formally include this requirement.  
ECD: September 1990.

## GENERAL REPORT COMMENTS

1. PART I - INTRODUCTION, Background. The fifth sentence states: "It is DoD policy to establish and maintain the minimum physical capacities and capabilities necessary to ensure a controlled, source of technical competence and the resources necessary to meet mobilization and other military contingencies." Recommend this be replaced with the following statement as cited in paragraph D, Policy, of DODD 4151.1 which is frequently referenced throughout the draft audit:

"It is DoD policy that maintenance support of DoD materiel is essential to the rapid and sustained application of military power. DoD components shall provide an adequate program for maintenance of assigned materiel to:

1. Provide for mobilization and surge requirements as specified in the most current Defense Guidance.

2. Meet efficiently and effectively peacetime readiness and combat sustainability objectives."

2. PART II, FINDINGS AND RECOMMENDATIONS, Background. The second paragraph states:

"DoD policy for assigning workload based on facility capacity states that the Military Departments should plan to accomplish an equivalent of 100 percent of peacetime work load based on a one shift, 40-hour week with the equivalent facility utilization of 185 percent of physical capacity during mobilization. In sizing capability and physical capacity of high surge (Utilization greater than 185 percent of physical capacity), the production shops shall consider limiting shop utilization to a maximum of 250 percent of physical capacity in mobilization. When mobilization work load in excess of 250 percent of physical capacity is forecast, a lower shop utilization in peacetime may be warranted so that the shop can accomplish mobilization requirements."

Recommend rewording as follows to more closely reflect guidance:

"DoD policy for assigning work load based on facility capacity states that the DoD Component facility utilization; in peace time shall be planned to accomplish the equivalent of 100 percent of peacetime workload capacity on a 40-hour week, one-shift basis with the equivalent of an organic facility utilization of 185 percent of physical capacity under mobilization. In sizing

organic capability and physical capacity of shops susceptible to high surge, or cost intensive facilitization, consideration shall be given to limiting individual shop utilization to a maximum of 250 percent of physical capacity during mobilization. When 250 percent of physical capacity would be exceeded due to a mobilization surge, a lower shop utilization of peacetime physical capacity may be justified."

3. Recommendation A.1., fifth line. Change "Instruction" to "Directive".

4. Part II, Section D, Background. The last sentence states, "The Directive defines the DTA as an evaluation process to be applied by decision makers to determine the most efficient location where a system will be repaired." This definition does not exist in the DoDD 4151.1. Recommend the definition cited in Enclosure 2 of the Directive be incorporated into the audit report.



SUMMARY OF POTENTIAL MONETARY AND OTHER  
BENEFITS RESULTING FROM AUDIT

| <u>Recommendation<br/>Reference</u> | <u>Description of Benefit</u>  | <u>Amount and/or<br/>Type of Benefit</u>  |
|-------------------------------------|--|---|
| A.1. and A.2.                       | <u>Compliance</u> - Implement requirements for Military Departments to comply with DoD Directive 4151.1 as it relates to capacity determination.   | Nonmonetary. Improved mobilization planning at the production shop level will help to ensure DoD maintenance facilities can meet their wartime commitments. |
| B.                                  | <u>Economy and Efficiency</u> - Army reevaluate its planned use of the National Guard depot for maintenance during mobilization.   | Nonmonetary. The Army will develop more realistic mobilization plans and will improve its war fighting capability.  |
| C.                                  | <u>Program Results</u> - Improvement in policy and procedures for determining depot maintenance mobilization requirements for the Army will result in more realistic mobilization plans. | Nonmonetary. Improved requirements determination will result in improved readiness.   |

SUMMARY OF POTENTIAL MONETARY AND OTHER  
BENEFITS RESULTING FROM AUDIT (Continued)

| <u>Recommendation<br/>Reference</u> | <u>Description of Benefit</u>   | <u>Amount and/or<br/>Type of Benefit</u>  |
|-------------------------------------|---|---|
| D.1 and D.2.                        | <u>Compliance</u> - Implement procedures for Military Departments to comply with DoD Directive 4151.1 by identifying documentation to be retained and included in the respective Military Department's regulations. | Cost Avoidance. Monetary benefits cannot be quantified. However, use of the Decision Tree Analysis process as cited in the examples on page 21 will result in a cost avoidance through more effective use of DoD maintenance resources. |

## ACTIVITIES VISITED OR CONTACTED

### Office of the Secretary of Defense

Office of the Assistant Secretary of Defense (Production and Logistics), Washington, DC

### Department of the Army

Deputy Chief of Staff for Logistics, Washington, DC  
Headquarters, Army Materiel Command, Alexandria, VA  
U.S. Army Aviation Systems Command, St. Louis, MO  
U.S. Army Communications-Electronics Command, Fort Monmouth, NJ  
U.S. Army Depot System Command, Chambersburg, PA  
Corpus Christi Army Depot, Corpus Christi, TX

### Department of the Navy

Office of the Deputy Chief of Naval Operations (Logistics), Washington, DC  
Naval Aviation Systems Command, Arlington, VA  
Naval Aviation Depot Operations Center, Patuxent, MD  
Naval Aviation Depot, Alameda, CA  
Naval Aviation Depot, North Island, CA  
Naval Aviation Depot, Jacksonville, FL  
Aviation Supply Office, Philadelphia, PA

### Department of the Air Force

Office of the Deputy Chief of Staff (Programs and Resources), Washington, DC  
Headquarters, Air Force Logistics Command, Wright-Patterson Air Force Base, OH  
San Antonio Air Logistics Center, San Antonio, TX  
Warner-Robins Air Logistics Center, Robins, GA

### Other Activities

National Guard Bureau, Washington, DC  
National Guard Bureau Army Aviation Division, Aberdeen Proving Ground, MD  
Aviation Classification and Repair Activity Depot, Fresno, CA  
Aviation Classification and Repair Activity Depot, St. Louis, MO  
Mobilization Aviation Classification and Repair Activity Depot Control Element, Havre de Grace, MD  
Joint Depot Maintenance Analysis Group, Dayton, OH



**AUDIT TEAM MEMBERS**

Donald E. Reed, Director, Logistics Support Directorate  
Thomas F. Gimble, Program Director  
Charles E. Sanders, Project Manager  
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Non-DoD Activities

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