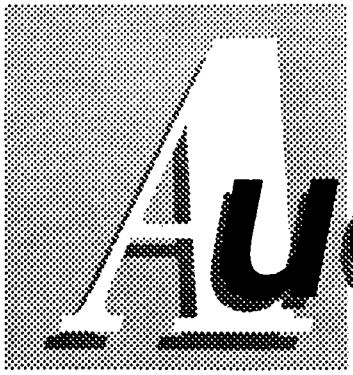

OFFICE OF THE INSPECTOR GENERAL

QUALITY ASSURANCE FOR ORGANIC DEPOT MAINTENANCE OF AIRCRAFT

Report No. 93-118 June 21, 1993

Department of Defense

Acronyms

ADR	Aircraft Deficiency Report
ALC	Air Logistics Center
CAB	Corrective Action Board
CCAD	Corpus Christi Army Depot
DLA	Defense Logistics Agency
DWO	Discrepancy Work Order
NADEP-CP	Naval Aviation Depot-Cherry Point
NADEP-NI	Naval Aviation Depot-North Island
OC-ALC	Oklahoma City-Air Logistics Center
PAT	Process Action Team
QDR	Quality Deficiency Report
QMB	Quality Management Board
TQM	Total Quality Management
WR-ALC	Warner Robins-Air Logistics Center

INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
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June 21, 1993

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

SUBJECT: Audit Report on Quality Assurance for Organic Depot Maintenance of Aircraft (Report No. 93-118)

We are providing this final report for your information and use. It addresses matters concerning the effectiveness of management and administration of quality assurance policies and procedures for scheduled aircraft maintenance at organic depots. Comments from the Army and the Director, Administration and Management (Office of the Secretary of Defense) on a draft of this report were considered in preparing this final report.

DoD Directive 7650.3, requires that all audit recommendations be resolved promptly. Therefore, we request that the Army, Navy, and Air Force provide final comments on the unresolved recommendations and internal control weaknesses by August 20, 1993. If you concur, describe the corrective actions taken or planned, the completion dates for actions already taken, and the estimated dates for completion of planned actions. If you nonconcur, please state your specific reasons. If appropriate, you may propose alternative methods for accomplishing desired improvements. Recommendations are subject to resolution in accordance with DoD Directive 7650.3 in the event of nonconcurrence or failure to comment. The potential monetary benefits in this report cannot be quantified.

The courtesies extended to the staff are appreciated. If you have any questions on this audit, please contact Mr. Christian Hendricks at (703) 692-3414 (DSN 222-3414) or Mr. Joseph Austin at (703) 692-3417 (DSN 222-3417). Copies of the final report will be distributed to the activities listed in Appendix C.

Robert J. Lieberman

Robert J. Lieberman
Assistant Inspector General
for Auditing

Office of the Inspector General, DoD

Report No. 93-118 June 21, 1993
(Project No. 2LB-0039)

QUALITY ASSURANCE FOR ORGANIC DEPOT MAINTENANCE OF AIRCRAFT

EXECUTIVE SUMMARY

Introduction. The DoD quality assurance program is designed to ensure that the Military Departments' maintenance facilities provide operational systems, within specifications, that satisfy users' requirements. The program should ensure adequate quality throughout all areas of performance and provide for the prevention and ready detection of deficiencies, and for prompt and positive corrective actions.

DoD budgeted about $4.1 billion for scheduled depot maintenance of aircraft for FY 1992. Increased budget pressure, as well as safety, requires that all work at military depots be performed correctly to reduce expensive rework and maintain safety and readiness.

Objectives. Our audit objective was to evaluate the effectiveness of management and administration of quality assurance policies and procedures for scheduled aircraft maintenance at organic depots. Specific objectives were to determine if use of quality assurance resources were adequately planned, if planned inspections and other procedures were actually performed, and if there was an adequate system of data analysis and feedback.

Audit Results. We determined that the Military Departments did not have adequate quality assurance programs.

o Four of the five aviation depots visited either had not developed adequate quality assurance plans or had developed and not implemented effective quality assurance plans. As a result, depot management had limited means for measuring the overall effectiveness of the depot maintenance programs (Finding A).

o The Military Departments did not record and track all internal quality deficiencies. Additionally, the Military Departments did not take prompt corrective and preventive actions to resolve 45 percent of the statistically selected reported external quality deficiencies reviewed during the audit. As a result, opportunities to reduce rework and its related costs have been missed and there was less assurance that safety and readiness levels were maintained (Finding B).

o Depot cost accounting systems did not fully identify the costs of correcting deficiencies during the rework processes. As a result, cost information that would assist in identifying and targeting quality deficiencies for correction was not being obtained (Finding C).

Internal Controls. The Military Departments did not have internal controls to ensure that quality deficiencies were properly identified, analyzed, and corrected and that cost data associated with correcting deficiencies were identified. Findings A, B, and C contain details on identified material weaknesses and Part I gives details of controls assessed.

Potential Benefits of Audit. The potential monetary benefits that could be achieved by identifying and correcting causes of deficiencies could not be quantified. Additional details on potential benefits resulting from audit are contained in Appendix A.

Summary of Recommendations. We recommended that the aviation depots be required to develop and implement comprehensive quality assurance plans, and implement effective internal control procedures. We also recommended that the Military Departments develop and maintain cost accounting systems for those depots.

Management Comments. The Army responded to and concurred with all recommendations except one. Actions taken or planned are responsive to our recommendations. The Army did not respond to the recommendation that guidance be issued on developing quality assurance plans. The Navy did not respond to the draft report. The Air Force comments were received too late to be included in the final report.

The Director, Administration and Management (Office of the Secretary of Defense) nonconcurred with the draft recommendation to issue specific guidance to the Military Departments on how Total Quality Management should be implemented. Based on comments received from the Director, we deleted the recommendation.

Audit Response. We request that the Army provide comments to the unaddressed recommendation in its response to the final report. We also request that the Navy and Air Force provide comments to the final report. All comments are requested by August 20, 1993.

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This report was prepared by the Logistics Support Directorate, Office of the Inspector General for Auditing, DoD. Copies of the report can be obtained from the Secondary Reports Distribution Unit, Audit Planning and Technical Support Directorate at (703) 614-6303 (DSN - 224-6303).

Part I - Introduction

Background

The DoD quality assurance program is designed to ensure that the Military Departments' organic maintenance facilities provide operational systems, within system specifications, that satisfy users' requirements. The program is to ensure adequate quality throughout all areas of performance, prevention and ready detection of deficiencies, and prompt and positive corrective actions.

There are two types of deficiency reporting, internal and external. Internal deficiencies are in-process defects that are identified when repaired or reworked components are tested in-house. They are normally documented on discrepancy work orders (DWOs). External deficiencies are defects that are identified by users (customers) of repaired or reworked parts or systems. They are documented on aircraft deficiency reports (ADRs) or quality deficiency reports (QDRs). ADRs are used to document deficiencies noted by the customer during aircraft acceptance inspection. QDRs are used by customers to document deficiencies on reworked components. For a quality assurance program to be effective, both internal and external deficiencies must be quickly identified and corrected.

In his June 30, 1990, memorandum, "Strengthening Depot Maintenance Activities," the Deputy Secretary of Defense directed the Military Departments to achieve $3.9 billion in depot maintenance savings over the 5-year period from FY 1991 through FY 1995. The Corporate Business Plan detailed the commitments the Military Departments have made to achieve this $3.9 billion in savings. This included cost saving actions which involved depot consolidations, conducting public (organic)-private and public-public competition for specific work loads and shifting work loads to other depots through increased interservicing.

DoD budgeted about $4.1 billion for scheduled depot level maintenance of aircraft for FY 1992. Increased budget pressure, as well as safety, requires that all work at military depots be performed correctly to reduce expensive rework and to maintain safety and readiness levels.

DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," February 23, 1991, part 6, section P, "Quality," prescribes policies and procedures for establishing a quality program. The Instruction requires that Military Specification MIL-Q-9858A, "Quality Program Requirements," August 7, 1981, be used as the criteria for developing quality programs in the Military Departments. The joint regulation for the Military Departments on reporting product quality deficiency data is prescribed in Defense Logistics Agency (DLA) Regulation 4155.24, "Product Quality

Deficiency Report Program," November 27, 1989. The regulation provides time frames for the initial reporting, cause correction, and status accounting for individual product quality deficiencies.

Objectives

Our audit objective was to evaluate the effectiveness of management and administration of quality assurance policies and procedures for scheduled aircraft maintenance at the organic depots. Specific objectives were to determine if use of quality assurance resources was adequately planned, if planned inspections and other procedures were actually performed, and if there was an adequate system for data analysis and feedback.

Scope

We reviewed the DoD, Military Departments, and joint DLA regulations for managing and administering quality assurance programs. We also reviewed draft guidance issued to the Military Departments for implementing Total Quality Management (TQM). We judgmentally selected and visited one Army, two Navy, and two Air Force aviation maintenance depots. At the five depots, we reviewed quality assurance plans that had been developed and implemented and other quality assurance related documentation that was available.

At the five aviation maintenance depots, we attempted to review internal deficiency reports. Except for the Naval Aviation Depots, we were unable to get a universe of internal deficiency reports to review. We statistically selected a sample of 171 of 8,723 internal deficiency reports prepared by the Navy for FYs 1991 and 1992 to determine if reported deficiencies were properly analyzed and if solutions for correcting the deficiencies were completed promptly. The Army and Air Force maintenance facilities visited did not maintain data bases capable of retrieving historical data, and the Air Force no longer writes internal deficiency reports.

During FYs 1991 and 1992, the five aviation maintenance depots received 6,911 external deficiency reports from their customers. We statistically selected a representative sample of 689 of the 6,911 external deficiency reports to determine if reported deficiencies were properly analyzed and if solutions for correcting the deficiencies were completed promptly. The universe and sample size for external deficiency reports is shown by type in Table 1.

Table 1. Aircraft and Quality Deficiency Reports Reviewed

Activity 1/	Aircraft Deficiencies	Quality Deficiencies	Total Deficiencies	Sample
CCAD	2/	500	500	167
NADEP-CP	191	586	777	201
NADEP-NI	196	452	648	139
OC-ALC	255	1,707	1,962	82
WR-ALC	51	2,973	3,024	100
Total	693	6,218	6,911	689

1/ CCAD - Corpus Christi Army Depot; NADEP-CP - Naval Aviation Depot Cherry Point; NADEP-NI - Naval Aviation Depot North Island; OC-ALC - Oklahoma City Air Logistics Center; and WR-ALC - Warner Robins Air Logistics Center.

2/ Could not readily determine the number of aircraft deficiencies in the universe of 500.

Engineering specialists from the Office of the IG, DoD, assisted us in evaluating the adequacy of the quality assurance plans. The engineers also assisted us in determining if aircraft and quality deficiency reports were analyzed and properly closed.

This economy and efficiency audit was performed from May through December 1992 in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the IG, DoD, and accordingly included such tests of internal controls as were considered necessary. Organizations visited or contacted during the audit are listed in Appendix B.

Internal Controls

Our 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. Controls were not effectively implemented to ensure that reported quality deficiencies were being properly analyzed and promptly corrected. Recommendations A.1., A.2., B., and C. in this report, if implemented, will correct the weaknesses. We could not determine the monetary benefits to be realized by implementing the recommendations because the depots did not maintain cost data for reworking deficiencies. A copy of the final report will be provided to the senior officials responsible for internal controls within the Office of the Secretary of Defense (OSD), and the Military Departments.

Prior Audits and Other Reviews

In the last 5 years, three reviews focused on the management and administration of quality assurance programs for aircraft depot maintenance. The IG, DoD, Report No. 90-027, "Management and Administration of Quality Assurance for Aircraft Maintenance Contracts," December 26, 1989, reported that quality assurance programs were not adequately planned, plans were not implemented, and systematic quality data evaluations were not performed. The report recommended that the Military Departments establish a joint task force to develop a quality assurance inspection program for maintenance contracts, and with DLA, issue policy guidance requiring specific quality assurance provisions on all contracts for organizational or intermediate level aircraft maintenance. The Military Departments and DLA concurred with the recommendation; and DLA Manual 8200.1, "Procurement Quality Assurance," was updated in December 1990.

The report also stated that the Military Departments and DLA did not have a system for reporting contractor quality history data on maintenance services. It recommended that the Deputy Assistant Secretary of Defense (Total Quality Management), clarify the requirement of DoD Directive 4155.1, "DoD Quality Program," August 10, 1978, for a quality data reporting system for service contracts, and that the Military Departments and DLA develop and implement a system for reporting contractor quality history. The Military Departments and DLA concurred with the recommendations. The contract profile system is scheduled to be completed in December 1994.

The Air Force Audit Agency's Report No. 9106216, "Management of Depot Maintenance Quality Assurance Program," September 20, 1990, stated that overall Air Force policies, procedures, and controls used to manage organic depot maintenance quality assurance programs were not completely effective. Specifically, the report noted that:

o QDRs were not adequately analyzed to ensure prompt resolution of defects.

o Installations maintenance organizations were not reporting all quality defects.

o Process action teams (PATs) were not making sufficient progress in resolving depot repair process problems.

o Data on solutions developed by PATs were not properly crossfed to other air logistics centers (ALCs).

The report recommended that Air Force Logistics Command Regulation 74-2, "Maintenance Quality Program," June 5, 1989, be revised to require quality assurance personnel to accomplish a trend analysis for QDRs and establish follow-on action procedures to ensure that the recommended quality deficiency corrective actions are accomplished. The Air Force concurred with the recommendation and revised the regulation in October 1991.

The report also recommended that Technical Order 00-35D-54, "USAF Materiel Deficiency Reporting and Investigating System," be revised to provide expanded criteria for identifying reportable QDR requirements. Headquarters, Air Force Materiel Command revised the technical order on April 15, 1991. OC-ALC implemented it, but at the time of our review, no action had been taken at the WR-ALC.

The Air Force Inspection Agency issued a functional management review Report PN 92-616, "Programmed Depot Maintenance (PDM)," July 31, 1992, which stated that overall quality of work accomplished at each ALC was considered good to commendable. However, some delivered PDM aircraft continued to have quality defects on a random basis. Although the report made no formal recommendations, it suggested that Technical Order 00-35D-54 be updated to designate the customer relations section within the depot as the office of primary responsibility for program depot quality reports involving aircraft inspections. The report suggested that Headquarters, Air Force Materiel Command pursue expanding the use of off-line or stand alone data bases to track, trend, and manage acceptance inspection data. It also suggested that Headquarters, Air Force Materiel Command, in conjunction with air staff, determine whether the acceptance inspection reports, in the GO21 information central computer system, added value to management planning. The report required no management response.

Part II - Findings and Recommendations

Finding A. Quality Assurance Programs

Four of the five aviation depots visited either had not developed adequate quality assurance plans or had not developed and implemented effective quality assurance plans for their quality assurance programs. The inadequate or ineffective plans were caused by a lack of attention to DoD guidance, confusion over whether quality assurance plans were required, and ineffective implementation of TQM into the quality assurance programs. As a result, depot management had limited means for measuring the overall effectiveness of the depot maintenance quality assurance programs.

Background

DoD Instruction 5000.2 prescribes the basic requirements of a quality assurance program. Military Specification MIL-Q-9858A provides details for developing the program. It states that the quality program, including procedures, processes, and product shall be documented and subject to review. Accordingly, the depot maintenance quality program must clearly prescribe the means to ensure effective management of the activity. Personnel performing quality functions must have sufficient, well-defined responsibility, authority, and organizational freedom to identify and evaluate quality problems and to initiate, recommend, or provide solutions. The depot must conduct a complete review of the requirements of work to be performed, to identify and make prompt provisions for test equipment, fixtures, tooling, processes, and special skills and controls required for ensuring product quality. The managers of the quality program should ensure that all work affecting quality is prescribed in clear and complete documented instructions. At a minimum, a good quality assurance plan must provide details of how the quality program will operate.

Implementing Military Departments' Guidance

The Military Departments have not implemented the requirements of DoD Instruction 5000.2, February 23, 1991, into their quality assurance programs. The Military Departments' guidance for quality assurance programs are Army Regulation 702-11, "Army Quality Program," April 15, 1979; Secretary of the Navy Instruction 4855.1, "Quality Assurance Program," September 10, 1979; and Air Force Regulation 74-1, "Quality Assurance Program," June 1, 1979.

The three Military Departments' guidance implements DoD Directive 4155.1, "DoD Quality Program," August 10, 1978, which was canceled February 23, 1991, with the issuance of DoD Instruction 5000.2. The Military Departments advised us that they are planning to implement the new instruction but have no time frames for completion.

The Military Departments have implemented TQM with little or no guidance on how it should be implemented. The Secretary of Defense memorandum, "Department of Defense Posture on Quality," March 30, 1988, directed the Under Secretary of Defense for Acquisition to take the lead in implementing TQM as an integral element of the entire acquisition process. The memorandum stated that TQM should be a part of each acquisition phase to include requirement formulation, design, development, production planning, solicitation and source selection, manufacturing, fielding, and support. DoD Instruction 5000.51G, "Total Quality Management," was intended to provide the basic guidance on implementing TQM. The Instruction has been in draft since February 1990. Cognizant personnel informed us that the TQM instruction will not be issued because DoD no longer believed that the Military Departments should be told how to implement TQM.

Quality Assurance Plans

Four of the five depots visited during the audit either had not developed adequate quality assurance plans or had developed and not implemented effective quality assurance plans. Personnel at the depots were confused as to whether plans were required even though the Military Departments had provided detailed, but not updated, guidance to the depots concerning the development of quality assurance plans that complied with MIL-Q-9858A. Although plans were not prepared, quality control functions were being performed. However, the effectiveness of the informal programs were unknown because of the lack of defined processes and feedback systems to measure overall program effectiveness.

Army. The CCAD developed a detailed quality assurance plan, "CCAD Quality Assessment Manual," May 5, 1992. Available records at the CCAD indicated that, although the Army guidance was published in 1979, this plan was the first published quality assurance plan by the depot. The plan, however, was not issued and as a result, cognizant personnel within the maintenance department were not aware that a plan existed. We believe that if the plan, as written, were implemented, the CCAD would be in compliance with DoD guidance.

Navy. The NADEP-CP issued a detailed quality assurance plan on February 24, 1992. The plan, as written, complied with DoD guidance. The depot has implemented the plan.

Although Navy guidance was published in 1979, available records at NADEP-NI indicate that a quality assurance plan had not been published. Management was aware that a plan was required, but had not made it a priority. At the time of our audit, NADEP-NI was in the process of developing a quality assurance plan. The first section of the plan was issued on September 17, 1992. Sufficient data were not available during our review for an adequate evaluation of the plan.

Air Force. At the time of our audit, the OC-ALC and WR-ALC had not developed quality assurance plans for the depots. Confusion existed at the depots over whether quality assurance plans were required. Some managers believed that only contractors had to develop quality assurance plans. Their emphasis had been placed on implementing TQM, even though the logistics centers had no detailed plans on phasing in TQM.

Total Quality Management Implementation

The Military Departments have not effectively implemented TQM at the aviation maintenance depots. For instance, the Military Departments have not developed detailed plans for transitioning from the traditional method of product quality assurance to TQM. Under the traditional method of product quality assurance, Military Specification MIL-Q-9858A requires that quality inspections and evaluations be performed independently by quality inspectors, evaluators, and management personnel. Under TQM, workers are to build quality into the products. The workers perform their own inspections and document any in-process deficiencies, thus eliminating the need for inspectors. We believe that TQM should be gradually phased in so that management can be assured that work is done correctly. TQM should be phased in as significant reductions in the level of quality deficiencies have occurred and when appropriate feedback systems have been implemented to keep management appraised of the potential problem areas within the depots.

Army. The CCAD was not eager to implement TQM. In fact, very little emphasis was placed on implementing TQM into the work place other than in providing training. The thrust at CCAD was still on the traditional method of product quality assurance.

Navy. TQM was introduced in 1986 at the NADEP-CP and in 1984 at NADEP-NI. The TQM programs have management and employee support. No radical changes have been made from the traditional method of product quality assurance to TQM. Specifically, the naval aviation depots use quality evaluators to perform work in-process inspections. However, the number of inspections has been reduced through the use of statistical process controls, which is a tool of TQM.

Air Force. At OC-ALC and WR-ALC, radical changes were made from the traditional method of product quality assurance to TQM, which was introduced in 1988. The Air Force implemented the program before it developed any detailed plans for transitioning to TQM, and as a result, problems developed. For example, the WR-ALC "Quality Improvement Award 1992 Evaluation," July 7, 1992, stated that the ALC's overall quality effort appeared to be disjointed. The 1992 evaluation also stated that few references were made to ALC policy, planning, etc. For example, the evidence failed to show that the ALC commander had comprehensive quality goals; the extensive senior leadership involvement in fostering a quality environment; the definitive organization service goals; and that "in-the-process" quality assurance techniques were being applied for prevention of defects rather than end-of-the-line defect detection.

Under TQM, the ALCs eliminated the quality inspectors, even though they were still needed. A gradual phase out of the inspectors did not occur while the ALCs attempted to build required quality into the product. Inspectors were simply eliminated. As a result, internal defects were being underrecorded or not recorded.

Summary

Quality assurance plans are necessary for management to have an effective quality assurance program. Each depot must prepare a plan as a means for devising a comprehensive, cohesive approach to measure its effectiveness. The plans should also provide a feedback mechanism for evaluating processes and process changes. Without the plans, the depots' abilities to control costs and increase efficiency are lacking. To compete successfully for future work and help decrease DoD support costs, depots must be able to demonstrate that they are operating efficiently and providing a quality product. To develop an effective quality assurance plan, the Military Departments need to incorporate and integrate the requirements of DoD Instruction 5000.2 into their guidance and mandate its use. For those Military Departments who have or plan

to implement TQM, its requirements should also be incorporated into the quality assurance plans. Findings B and C in this report also identify internal control weaknesses that will need to be addressed in the quality assurance plans.

The Director, Administration and Management (Office of the Secretary of Defense) nonconcurred with our draft recommendation to issue specific guidance to the Military Departments on how to implement TQM. The Director stated that quality management is not a series of specific steps to be taken by an organization but a theory by which to manage an organization. Since the missions of DoD organizations vary, there will be different approaches to implementing the theories of quality management. According to the Director, one of the basic tenents of TQM is to support innovation and not insist upon how a specific task will be accomplished. Based upon that response, we concluded that provision of useful detailed DoD guidance was not feasible and we deleted our recommendation to finalize DoD Instruction 5000.15G.

Recommendations, Management Comments, and Audit Response

1. We recommend that the Secretaries of the Army, Navy, and Air Force issue guidance on developing quality assurance programs. Emphasis should be on integrating the requirements of DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," February 23, 1991, part 6, section P, "Quality," and Total Quality Management (TQM).

Management Comments. The Army provided comments to the draft report; however, Recommendation A.1. was not addressed. As of June 11, 1993, no comments had been received from the Navy. The Air Force comments were received too late for inclusion in the final report.

Audit Response. We request that Army, Navy, and Air Force comment on Recommendation A.1. in their responses to the final report. The comments should include estimated completion dates of any agreed-upon actions.

2. We recommend that the Commanders, Army Materiel Command, Naval Air Systems Command, and Air Force Materiel Command require the aviation maintenance depots to develop and implement comprehensive quality assurance plans to be used as detailed guidance for measuring the effectiveness of product quality assurance at the maintenance depots. The plans should also address the implementation of TQM.

Management Comments. The Army concurred with Recommendation A.2. and stated that the Depot Systems Command would be instructed to have quality assurance plans in place at the maintenance depots by August 31, 1993. The complete text of the Army's comments is in Part IV of this report. As of June 11, 1993, no comments had been received from the Navy. The Air Force comments were received too late for inclusion in the final report.

Audit Response. The Army's comments to Recommendation A.2. are responsive and additional comments are not required. The Navy and Air Force are requested to provide comments to Recommendation A.3. The comments should include estimated completion dates.

Finding B. Reporting and Correction of Quality Deficiencies

The Military Departments did not record and track all internal quality deficiencies. Additionally, the Military Departments did not take prompt corrective and preventive actions to resolve 45 percent of the statistically selected, reported external quality deficiencies. The conditions were caused by a lack of effective internal control procedures for identifying and reporting, analyzing and correcting, and monitoring and evaluating quality deficiencies. As a result, opportunities to reduce rework and its related costs have been missed, and there was less assurance that safety and readiness levels were maintained.

Background

DoD Instruction 5000.2 requires that Military Specification MIL-Q-9858A be used as the criteria for developing quality programs. MIL-Q-9858A requires that emphases be placed on monitoring, evaluating, and correcting problems through quality control techniques such as in-process quality inspections, statistical quality control charts, and quality deficiency audits. Conversely, TQM emphasizes workers building quality into the products versus ensuring quality through quality inspections.

DLA Joint Regulation 4155.24, "Product Quality Deficiencies Reporting Program," November 27, 1989, establishes policy for reporting product quality deficiency data. It applies to product quality deficiencies detected on new or reworked Government-owned products. It applies to products inspected and accepted at source or inspected at source and accepted at destination.

The joint regulation establishes a system for feedback of product QDR data that provides for the initial reporting, cause correction, and status reporting of individual product quality deficiencies, as well as to identify problems, trends, and recurring deficiencies. It states that category 1 deficiencies (potential loss of life or affects safety of flight) are required to be analyzed and methods of correcting the deficiencies must be determined within 20 days of receipt of investigation request without need of exhibit (the defective item) or 20 days after receipt of exhibit. Category 2 deficiencies (all other deficiencies) must be analyzed and the method of correction must be determined within 30 days after receipt of request without need of exhibit or 30 days after receipt of exhibit. ADRs also have to be corrected promptly; however, they do not fall under the time criteria of quality deficiencies. ADRs are written when the customer

performs the acceptance inspections of the aircraft. The noted deficiencies are usually corrected on the spot either by repairing the component or by replacing the component with another.

A good quality assurance program requires a system of internal controls for identifying and recording product quality deficiencies, analysis and correction, and monitoring and evaluating quality deficiencies. After deficiencies have been identified, analyzing and correcting them should be a priority. Deficiencies need to be monitored and evaluated to alert management of potential problems and to aid in eliminating recurring quality deficiencies. Correcting the causes of deficiencies provides management with the opportunity to reduce work and related costs and to maintain safety and readiness levels. The weaknesses noted in the Military Departments' correction of quality deficiencies can be attributed to breakdowns in the internal controls.

Identifying and Reporting Product Quality Deficiencies

The Military Departments did not identify, report, and track all internal quality deficiencies. The system for identifying and reporting internal quality deficiencies broke down at some depots due to the implementation of TQM. As a result, management was not made aware of any potential problems and thus lost opportunities to eliminate recurring quality deficiencies. Internal quality deficiencies reported for FYs 1991 and 1992 by the five depots visited are shown in Table 2.

Table 2. Internal Deficiencies for FYs 1991 and 1992

Activity	FY 1991	FY 1992	FYs 1991 and 1992 Total
CCAD	- *	- *	- *
NADEP-CP	640	837	1,477
NADEP-NI	4,710	2,536	7,246
OC-ALC	- *	- *	- *
WR-ALC	- *	- *	- *
Total	5,350	3,373	8,723

* Could not determine the extent of internal deficiencies.

Internal Deficiencies. Internal quality deficiencies were not always being identified and reported when required or tracked within the Military Departments. Prior to TQM, quality inspectors and evaluators identified internal deficiencies and prepared the DWOs to document the need for rework. Because most inspectors and evaluators have been eliminated under TQM, the task of assessing work for rework has rested with the workers themselves. Workers were either discouraged from doing the necessary reports or did not have the time to record the in-process deficiencies.

Army. We could not determine the extent of internal quality deficiencies at CCAD because of insufficient data. DWOs should have been available because CCAD has not emphasized TQM implementation. The need for some rework should have been identified. For example, a FY 1991 overhaul and repair program for the T-53 engine showed that approximately 307,000 labor hours had been expended; however, there were no rework hours identified with the program. For a program this size, some rework hours would have been necessary. When we discussed this with maintenance personnel at CCAD, we were advised that deficiencies were not recorded because of time constraints.

Even when DWOs were prepared, the rework hours were not reflected in the performance summary report. For example, we obtained the performance summary report from accounting for the hydraulic work center (5JC40) and tried to match hours recorded due to rework with those recorded on DWOs that we were able to obtain. The rework hours noted on the DWOs were not listed in the performance summary report because they were not entered into the cost accounting system. As a result, the performance summary report which lists all labor hours expended on a program work center was understated. The effectiveness of the performance summary report to management for identifying potential maintenance problem areas is minimized if the report does not reflect accurate labor costs.

Navy. For FYs 1991 and 1992, NADEP-CP and NADEP-NI reported 8,723 internal deficiencies (DWOs). Maintenance personnel at NADEP-CP reported 640 DWOs for FY 1991 and 837 DWOs for FY 1992. The significant increase in DWOs for FY 1992 can be attributed, in part, to a Naval Air Systems Command's reorganization in FY 1991. However, during the reorganization, we were informed that DWOs were not always prepared. A memorandum, "Quality Index Report," November 21, 1991, from the Quality Systems Management Office Director to the Production Department Director at NADEP-CP stated why deficiencies should not be reported. The memorandum stated that documented internal defects would have a negative effect on the quality index that is included as an element in the division director's

performance appraisal. As a result, according to cognizant personnel, internal deficiencies were underreported, even though the number of DWOs reported increased in FY 1992. We were unable to quantify the extent of the underreporting of DWOs.

For FYs 1991 and 1992, maintenance personnel at NADEP-NI reported 4,710 DWOs for FY 1991 and 2,536 DWOs for FY 1992. The NADEP-NI's decline in reported internal deficiencies was caused, in part, by a reduction in quality inspectors and evaluators as a result of a reorganization and implementation of TQM. We were unable to determine whether all reworks were identified and reported in FY 1992.

Air Force. We were unable to determine the extent of internal deficiencies at OC-ALC and WR-ALC because of lack of data and implementation of TQM within the Air Force. We were advised that, under TQM, inspectors were removed, leaving the requirement of documenting deficiencies to workers performing the maintenance.

Under TQM, workers build quality into the product, thereby eliminating the need for independent quality inspections. We believe, however, that workers need a reporting system to tell management when systemic problems exist that are outside the workers' control to fix. Workers should use the DWOs to report problems that cause them to spend more than the required standard time to complete a task. Management also needs to know the cost of rework efforts, the reasons for rework, and how to avoid future problems if depots are to be price competitive in the future. Therefore, workers should prepare internal deficiency reports, and management should use the reports as tools to prevent future product quality deficiencies.

External Deficiencies. Based on available records at the five depots visited, we validated that customer reported aircraft and quality deficiencies were properly controlled. During FYs 1991 and 1992, customers reported 6,911 aircraft and quality deficiencies on either ADRs or QDRs (Table 3).

Table 3. Aircraft and Quality Deficiencies for FYs 1991 and 1992

Activity	FY 1991 ADR	FY 1991 QDR	FY 1991 Total	FY 1992 ADR	FY 1992 QDR	FY 1992 Total	FYs 1991 and 1992 Total
CCAD	- *	- *	251*	- *	- *	249*	500
NADEP-CP	89	330	419	102	256	358	777
NADEP-NI	98	261	359	98	191	289	648
OC-ALC	141	775	916	114	932	1,046	1,962
WR-ALC	27	1,521	1,548	24	1,452	1,476	3,024
Total	355	2,887	3,493	338	2,831	3,418	6,911

* Could not separate ADRs and QDRs in the universe.

Analyzing and Correcting Product Quality Deficiencies

For the two Navy depots visited, we validated that the reported DWOs were corrected promptly. ADRs were also corrected promptly in all the Military Departments. However, all of the Military Departments did not take prompt corrective and preventive action to resolve 45 percent of the statistically selected, reported QDRs reviewed during the audit. The most commonly cited reason for not analyzing and correcting QDRs was that there was a delay in shipping or receipt of the exhibit. As a result, opportunities to maintain safety and readiness levels may have been missed.

For the five depots visited, we randomly selected 689 ADRs and QDRs from a universe of 6,911 reports (Table 4).

Table 4. Aircraft and Quality Deficiencies Reviewed for FYs 1991 and 1992

Activity	Total Universe	Sample Size	No. ADRs	No. QDRs	Category 1	Category 2
CCAD	500	167	17	150*	0	150
NADEP-CP	777	201	55	146	62	84
NADEP-NI	648	139	59	80	32	48
OC-ALC	1,962	82	6	76	6	70
WR-ALC	3,024	100	30	70	0	70
	6,911	689	167	522*	100	422

* We evaluated 519 of the 522 QDRs. For three QDRs, sufficient information was not available to perform a complete analysis.

Analysis of the sampled 167 ADRs showed that all were promptly analyzed and corrected. The Military Departments are commended for promptly analyzing and correcting ADRs.

For the five depots visited, we evaluated 519 QDRs for timeliness of correction. Of the 519 QDRs, 100 were category 1 and 419 were category 2 (Tables 5 and 6).

Table 5. Time Required to Analyze and Correct Category 1 Quality Deficiencies (Days)

Activity	0-20 Days	21-60 Days	61-90 Days	91-180 Days	Over 180 Days	Total
CCAD	0	0	0	0	0	0
NADEP-CP	14	14	26	8	0	62
NADEP-NI	5	15	7	5	0	32
OC-ALC	3	2	0	1	0	6
WR-ALC	0	0	0	0	0	0
Total	22	31	33	14	0	100

Table 6. Time Required to Analyze and Correct Category 2 Quality Deficiencies (Days)

Activity	0-30 Days	31-60 Days	61-90 Days	91-180 Days	Over 180 Days	Total
CCAD	31	34	35	41	6	147
NADEP-CP	19	43	17	5	0	84
NADEP-NI	5	18	16	9	0	48
OC-ALC	22	12	17	16	3	70
WR-ALC	34	11	10	9	6	70
Total	111	118	95	80	15	419*

* We evaluated 419 of the 422 category 2 QDRs. For three QDRs, sufficient information was not available to perform complete analyses.

Our analysis of 519 QDRs showed that they were not always analyzed and corrected promptly. One of the key elements to maintaining customer satisfaction is analyzing and correcting reported deficiencies promptly. Of the category 1 QDRs, 47 percent were still unresolved after 60 days. Of the category 2 QDRs, 45 percent were still unresolved after 60 days. We used 60 days as a measurement of timeliness for analyzing and correcting deficiencies because of the time variances allowed for correcting category 1 and category 2 QDRs. This also provided time for exhibits to be sent to depots if they were not sent with the QDRs. The 60-day period allows up to 30 days for the customer to ship the exhibit and allows the depots up to 30 days to determine the method of correction after receipt of the exhibit. Category 1 deficiencies (potential loss of life or affects safety of flight) are required to be analyzed and the method of correction determined within 20 days after receipt of investigation request or 20 days after receipt of exhibit. Category 2 deficiencies are required to be analyzed and the method of correction be determined within 30 days after receipt of the investigation request or 30 days after receipt of exhibit.

Army. We statistically selected and reviewed 147 of 500 quality deficiencies reported to CCAD. About 55 percent of the reported deficiencies were not corrected within 60 days after the investigation request. The most commonly cited reason for the delay was that there was a delay in shipping or nonreceipt of the exhibits. For example, the depot requested an exhibit (QDR report control No. W51HX-89-10001, gearbox assembly) on October 7, 1991; the QDR was closed on March 2, 1992, due to nonreceipt of the exhibit. Another reason cited on closed QDRs was that the depot was not responsible for correcting the deficiencies because the exhibits had been tampered with by organizational level

maintenance personnel. While a delay in receipt of an exhibit may be a valid reason for untimely action; we believe analysis of an item should be performed upon receipt, regardless of whether the item was tampered with, to determine the cause of the item deficiency.

Navy. From a universe of 1,425 quality deficiencies at the NADEP-CP and NADEP-NI, we statistically selected 226 for review. The sample included 94 category 1 and 132 category 2 QDRs. Of the QDRs in the sample, 94 (41 percent) were not corrected after 60 days. Of the 94 not corrected after 60 days, 46 were safety of flight deficiencies that should have been corrected within 20 days after the investigation request or within 20 days after receipt of the exhibit. For example, NADEP-NI received a category 1 QDR report control No. V09014-0003, gyroscope, on March 12, 1991; the exhibit was not requested until July 11, 1991. The most commonly cited reason for the delay was that there was delay in shipping or nonreceipt of the exhibit.

Air Force. From a universe of 4,987 quality deficiencies at the OC-ALC and WR-ALC, we statistically selected 146 for review. The sample included 6 category 1 and 140 category 2 QDRs. Of the 146 QDRs, 62 (42 percent) had not been corrected within 60 days. Of that 62, only one QDR was coded category 1 and should have been settled within 20 days after the investigation request or within 20 days after receipt of the exhibit. The most commonly cited reason for not correcting deficiencies promptly was that there was a delay in shipping or nonreceipt of the exhibit. We were also informed that 11 QDRs were not investigated at WR-ALC because of a policy change or because funds were not available to perform the investigations. The policy change was that investigation of a QDR would only be performed when a trend existed rather than when the problem first occurred. The QDRs were closed and customers were instructed to return items through normal repair channels. The instructions applied to the C-130 program and the avionics program.

We did not evaluate the effect of the delays on the customer nor did we find evidence that management was monitoring the correction of QDRs. Delays in correcting category 1 quality deficiencies can affect the safety of flights or result in the grounding of aircraft. Delays in or not correcting category 2 deficiencies could result in customers not reporting deficiencies. Management would then not have the necessary feedback for analyzing the efficiency of the depot.

Monitoring and Evaluating Quality Deficiencies

Programs set up to ensure that the root cause of critical or chronic depot maintenance repair process problems were identified and corrected could be improved. The depots maintained insufficient data to verify that the evaluation groups identified, recorded, and provided solutions for correcting the root causes of quality deficiencies.

To research and resolve various issues affecting quality at the five depots, evaluation groups, such as corrective action boards (CABs), quality management boards (QMBs), and PATs were formed. The groups' quality evaluations are essential elements of any quality assurance program. The evaluations allow management to compare actual performance against given standards.

Army. The CAB at CCAD did not always do an effective job in ensuring that the root causes of critical or chronic problems affecting product quality and efficient production were identified and corrected. The CAB used correction action teams (CATs) to determine the causes of problems and to recommend corrective actions. The tasking and formal results of the CATs were not documented and maintained at the depot. An example of a deficiency not being corrected promptly was a leaking servo cylinder in the hydraulic shop at the CCAD. The problem has existed for about 10 years. During 1991, 1,035 units were assembled and 305 were rejected (193 of the 305 rejections were caused by a leaking seal). During the first 8 months of 1992, 582 units were assembled and 226 were rejected (156 of the 226 rejections were caused by a leaking seal). The seal problem existed because the seal being used was not the proper size. Shop personnel were modifying the seal to get the proper size. The seal specification needed to be revised; however, for 10 years, engineers could not agree on how to fix the problem. Management was aware that the problem existed but did not do anything to correct the problem. A quality assurance specialist estimated that about $27,000 was expended per year reworking and replacing new seals. About $268,000 had been expended over a period of 10 years.

Navy. The QMB at NADEP-CP did not do an effective job of documenting that systemic causes of maintenance related problems were identified, corrected, and communicated to personnel requiring the information. The QMB used PATs to resolve depot maintenance problems. The progress of the PATs was tracked during weekly QMB meetings and noted in the QMB minutes. Results of PATs, however, were not distributed within the depot divisions nor to other

depots that may experience similar problems. PATs results of review should be shared to obtain the broadest benefits possible and to prevent duplication of effort and expenses.

The Project Management Technical Office at the NADEP-NI did not adequately document that the causes of problems relating to production lines were identified, corrected, and communicated to maintenance personnel requiring the information. Teams were made up of personnel from Production Support, Planning, Material Management, Production, and Quality. Results of reviews conducted by the teams were recorded only in the minutes of the specific production line group meeting. No formal records of the reviews existed; neither were results communicated to personnel within the depot or other depots performing similar work.

Air Force. The PATs at OC-ALC did not adequately document that the root causes of maintenance problems were identified, corrected, and communicated to personnel requiring the information. Records showed that PATs were formed and meetings were held. However, records did not show that recommendations made by PATs were implemented and results of reviews were crossfed to other AFLCs for use as required by AFLC Regulation 74-2.

WR-ALC also did not adequately document that the causes of maintenance problems at the depot were identified, corrected, and communicated. The depot used PATs and work center quality teams to solve maintenance repair process problems. A number of teams were formed since 1990. The teams did not document their final results of investigations of problem areas nor did they provide results to other AFLCs. A PAT within the C-130 directorate had been ongoing since 1988, although no reports had been issued. Personnel within the C-130 directorate were not aware of the requirement to crossfeed results of PATs to other depots.

Historical Data. Each of the Military Departments maintained systems for storing data related to ADRs and QDRs. However, data on DWOs deficiencies were not readily available to depot personnel requiring the data. Without access to adequate data, quality assurance personnel could not readily perform trend analysis or research that could assist in the prompt correction of problems.

Army. The Army had the Maintenance Inspection Data Analysis System (MIDAS) for storing data related to maintenance deficiencies. MIDAS was designed to research and provide data on deficiencies occurring within centers for DWOs, ADRs, and QDRs. Data relating to ADRs and QDRs were readily available. However, data relating to DWOs could not be readily retrieved. In addition, the MIDAS was not designed so that the history of a specific

component could be researched. One could not select a component and determine the number and type of defects occurring over a specific period. The data are necessary in preparing trend analysis used to identify recurring defects.

Navy. The NADEP-CP and NADEP-NI use the workload control system (WCS) to store data concerning DWOs, ADRs, and QDRs. The data are easily retrievable by and readily available to necessary personnel within the depots. The system provides data on various components reworked at the depots and are being used by personnel performing quality assurance functions. Trend analyses were prepared by quality assurance personnel and used to highlight recurrent defects, alert management to potential problems, and to select depot maintenance repair processes for review.

Air Force. At both the OC-ALC and WR-ALC, historical data are stored in the GO21 information central computer system. Data were readily available on ADRs and QDRs; however, historical data concerning DWOs were not available. Data concerning ADRs and QDRs are stored by components and are being used.

Summary

The Military Departments did not record and track all internal deficiencies nor promptly correct external reported deficiencies. To reduce overhaul and repair deficiencies and possibly loss of life or safety of flight problems, prompt investigations must be performed to identify and correct the causes of recurring deficiencies and systemic problems. Management should monitor reported deficiencies and the receipt of customer exhibits in order to preclude recurrences and to service the customer promptly. To accomplish this, all maintenance deficiencies must be reported and documented so that data can be made available to all maintenance personnel. Management must be able to evaluate overall effectiveness of the depots to not only reduce cost but to promptly satisfy customers need.

Recommendations, Management Comments, and Audit Response

We recommend that the Commanders, Army Materiel Command, Naval Air Systems Command, and Air Force Materiel Command require the depots to

develop effective internal control procedures that will provide for the prompt detection and correction of product quality deficiencies. At a minimum, such procedures should emphasize:

1. Recording and reporting internal product quality deficiencies.

2. Monitoring the status of category 1 and category 2 quality deficiencies reports to ensure prompt corrective actions.

3. Monitoring the receipt of customer exhibits to ensure that customers are reminded of the need to send them in when required. Emphases should be placed on customers promptly returning each exhibit to the depots when requested for analyses and corrective action to be taken.

4. Analyzing and correcting product quality deficiencies promptly.

5. Performing evaluations to resolve issues that affect quality at the depots; and documenting results of the evaluations.

6. Developing procedures for sharing data within and between depots on solutions reached for correcting quality deficiencies.

Management Comments. The Army concurred with the Recommendation and stated that the Depot Systems Command and the Aviation and Troop Command would be instructed to implement the Recommendation by August 31, 1993. The complete text of the Army's comments is in Part IV of this report. As of June 11, 1993, no comments had been received from the Navy. The Air Force comments were received too late to be included in the final report.

Audit Response. The Army's comments to the Recommendation are responsive and additional comments are not required. The Navy and Air Force are requested to provide comments to the Recommendation in their response to the final report. The comments should include estimated completion dates.

Finding C. Identifying and Recording Rework Costs

Depot cost accounting systems did not fully identify the costs of correcting deficiencies during the rework processes. The condition existed because of a failure to record all deficiencies and costs to include documentation relating to reworking the deficiencies. As a result, cost information that would assist management in identifying and targeting quality deficiencies for correction was not being obtained.

Background

DoD Instruction 5000.2, requires that all DoD Components develop, maintain, and use quality cost data as a management element of the quality program. The data should identify the cost of both the prevention and correction of defective work. The three categories of quality costs are failure, appraisal, and prevention. Failure costs are corrective action costs, including rework cost. Appraisal and prevention costs are costs to identify and prevent quality deficiencies.

The price charged by aviation maintenance depots for their services must include the quality costs. Therefore, the quality cost component must be identified and analyzed for the depots to be competitive in pricing their services. Depot maintenance facilities need to gain a clear picture of the facilities' quality effectiveness and the total cost incurred when a product is reworked if they are going to keep cost down.

Recording Rework Costs

The five depots included in the audit had not fully identified the costs of correcting defects during the rework processes. We were provided summary data, which represented the cost of quality, that is, appraisal, failure, and prevention cost. However, we were unable to reconcile the summary data to individual accounts in the accounting system. For instance, we were provided the account source codes that made up the cost of quality; but when we added those totals the amounts did not reconcile to the cost of quality

summary data. We also could not track the source of inputs to those accounts. We determined that all rework hours were not being recorded; consequently, the rework costs in the cost accounts were understated.

Army. CCAD used MIDAS to record costs that resulted from production defects identified by quality assurance personnel. However, the data were not verifiable and accurate. For example, we were unable to reconcile cost data from product deficiency reports with the data recorded in the accounting system, because we could not determine the source for the data shown in the accounting system. Furthermore, we were advised that all internal deficiencies were not recorded in MIDAS because of a shortage of personnel within the quality branch and time constraints. The shortage caused the rework hours and costs to be understated in the accounting system.

Navy. At the NADEP-CP, the cost accounting system recorded some summary cost data for quality. We were provided summary accounting data of the accounts by the Budget and Finance Office, but we were unable to track the source of the inputs to these accounts. Additionally, we could not trace the rework hours for selected QDRs to the summary cost account for quality. Furthermore, personnel at the depot informed us that due to the negative effect of writing DWOs all rework costs were not being documented.

At the NADEP-NI, the cost accounting system recorded some summary data for quality cost. The Budget and Finance Office provided us with summary accounting data that made up the quality account. We could not trace the data to any source documents. Personnel advised us that all deficiencies and related rework cost were not recorded because of the reduction in quality inspectors and evaluators during a reorganization.

Air Force. At the OC-ALC and WR-ALC, some summary cost data for rework hours were available. However, the data were not accurate because the logistics centers did not record in-process deficiencies. For example, at the WR-ALC, from November 1990 through March 1992, some QDRs were not being investigated because of a policy change of when deficiencies should be investigated due to lack of funding. The QDRs were closed and customers were instructed to return items through normal repair channels. The cost to repair the items (that is, rework cost) was not separately identified. This resulted in underreporting of rework cost.

It is necessary that the depots record and maintain accurate data relating to the cost of reworking product quality deficiencies. Both the cost of prevention and correction of defective work must be documented and reported. Costs reported in the cost accounting systems and the accounting systems' general ledgers need

to be consistent and accurate, especially when competing on future work load. Without quality cost data, management cannot gain a clear picture of the facility quality effectiveness and total cost when products are reworked.

Recommendations, Management Comments, and Audit Response

We recommend that the Commanders, Army Materiel Command, Naval Air Systems Command, and Air Force Materiel Command require the Military Departments' maintenance depots to:

1. Develop and maintain cost accounting systems that identify all costs of preventing and correcting quality deficiencies.

2. Reconcile costs reported in the cost accounting systems with amounts reported in the accounting systems' general ledger accounts associated with the rework processes.

Management Comments. The Army agreed with the Recommendations and stated that the Depot Systems Command and each maintenance depot would be instructed to correct the noted deficiencies and implement the Recommendations by November 30, 1993. The complete text of Army's comments is in Part IV of this report. As of June 11, 1993, no comments had been received from the Navy. The Air Force comments were received too late to be included in the final report.

Audit Response. The Army's comments to the Recommendations are responsive and additional comments are not required. We request that the Navy and Air Force provide comments to the Recommendations in their response to the final report. The comments should include estimated completion dates.

Part III - Additional Information

Appendix A: Summary of Potential Benefits Resulting From Audit

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
A.1.	Internal Control. Military Departments will implement policies and procedures for developing quality assurance programs.	Nonmonetary.
A.2.	Internal Control. Military Departments will implement internal controls to comply with OSD guidance for developing and implementing quality assurance plans.	Nonmonetary.
B.	Internal Control. Military Departments will implement internal controls to comply with OSD guidance for prompt detection and correction of product quality deficiencies.	Nonmonetary.
C.	Internal Control. Military Departments will implement internal controls to comply with OSD guidance for developing and maintaining cost accounting systems that capture cost related to preventing and correcting product quality deficiencies.	Nonmonetary.

Appendix B. Organizations Visited or Contacted

Office of the Secretary of Defense

Assistant Secretary of Defense (Production and Logistics), Director of Maintenance Policy, Washington, DC
Director, Administration and Management, Washington, DC

Department of the Army

Office of the Deputy Chief of Staff for Logistics, Washington, DC
Headquarters, Army Materiel Command, Alexandria, VA
Depot Systems Command, Chambersburg, PA
Aviation and Troop Command, St. Louis, MO
Corpus Christi Army Depot, Corpus Christi, TX

Department of the Navy

Office of the Assistant Secretary of the Navy (Research, Development and Acquisition), Arlington, VA
Naval Air Systems Command, Arlington, VA
Naval Aviation Depot Operations Center, Patuxent River, MD
Naval Aviation Depot, Cherry Point, NC
Naval Aviation Depot, Jacksonville, FL
Naval Aviation Depot, Norfolk, VA
Naval Aviation Depot, North Island, CA

Department of the Air Force

Office of the Air Force Deputy Chief of Staff, Logistics and Engineering, Washington, DC
Headquarters, Air Force Materiel Command, Washington, DC
Air Force Inspection Agency, Norton Air Force Base, CA

Department of the Air Force (cont'd)

Oklahoma City Air Logistics Center, Tinker Air Force Base, OK
Warner Robins Air Logistics Center, Robins Air Force Base, GA

Defense Agency

Defense Logistics Agency, Alexandria, VA

Appendix C. Report Distribution

Office of the Secretary of Defense

Assistant Secretary of Defense (Production and Logistics)
Assistant Secretary of Defense (Public Affairs)
Comptroller of the Department of Defense
Director, Administration and Management

Department of the Army

Secretary of the Army
Inspector General

Department of the Navy

Secretary of the Navy
Assistant Secretary of the Navy (Financial Management)
Auditor General, Naval Audit Service

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Air Force Audit Agency

Defense Agencies

Director, Defense Contract Audit Agency
Director, Defense Logistics Agency
Director, Defense Logistics Studies Information Exchange
Office of the Inspector General, Defense Intelligence Agency

Non-DoD Organizations

Office of Management and Budget
  National Security Division, Special Projects Branch
U.S. General Accounting Office
  National Security and International Affairs Division,
    Technical Information Center
  National Security and International Affairs Division,
    Defense and National Aeronautics and Space Administration Management Issues
  National Security and International Affairs Division,
    Military Operations and Capabilities Issues

Chairman and Ranking Minority Member of Each of the Following Congressional Committees and Subcommittees:
  Senate Appropriations Committee
  Senate Subcommittee on Defense, Committee on Appropriations
  Senate Committee on Armed Services
  Senate Committee on Government Affairs
  House Committee on Appropriations
  House Subcommittee on Defense, Committee on Appropriations
  House Committee on Armed Services
  House Committee on Government Operations
  House Subcommittee on Legislation and National Security, Committee on Government Operations

Part IV - Management Comments

Office of the Secretary of Defense Comments

OFFICE OF THE SECRETARY OF DEFENSE

WASHINGTON, DC 20301-1950

ADMINISTRATION AND MANAGEMENT

28 MAY 1993

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Draft Report on the Audit of Quality Assurance for for Organic Depot Maintenance of Aircraft (Project No. 2LB-0039)

This memorandum is in response to Finding A, Recommendation #2 of the above-captioned draft audit report, which states as follows:

> 2. We recommend that the Director, Administration and Management (Office of the Secretary of Defense) issue specific guidance to the Military Departments on how Total Quality Management should be implemented.

I disagree with this recommendation.

Quality Management is not a series of specific steps to be taken by an organization or a military department--it is a theory by which to manage organizations. Since the missions of DoD organizations vary, there will be different approaches to implementing the theories of Quality Management. In fact, one of the basic tenets of Quality Management is that superiors should not insist upon how a specific task will be accomplished, but should support innovation amongst the organization's members in accomplishing the overall aims of the organization.

In addition, there are several theorists in the field of Quality Management. The military departments have chosen the theory that they think fits their department best. Over the past several years, they have expended valuable resources to develop training and facilitation skills that support their theories. Should we now issue specific guidance on how Quality Management should be implemented, it would, in most cases, require significant additional expenditures of scarce resources. I do not believe these new expenditures would be in the best interest of the DoD.

Should you have any questions regarding this memorandum, or wish to obtain additional information regarding Quality Management implementation, please call my Director for Quality Management, Anne O'Connor, at (703) 697-7171.

David O. Cooke
Director

Department of the Army Comments

Final Report Reference

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

Received in DAIG 01 JUN 1993

26 MAY 1993

DALO-AV

MEMORANDUM THRU

DEPUTY CHIEF OF STAFF FOR LOGISTICS

~~DIRECTOR OF THE ARMY STAFF~~ MICHAEL L. RAMIREZ, LTC, GS, ADAS

ASSISTANT SECRETARY OF THE ARMY (INSTALLATIONS, LOGISTICS AND ENVIRONMENT)

Deputy Assistant Secretary of the Army (Logistics)

FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE (AUDITING)

SUBJECT: Draft Report on the Audit of Quality Assurance for Organic Depot Maintenance of Aircraft (Project No. 2LB-0039), 31 March 1993--*INFORMATION MEMORANDUM*

1. HQDA IG memorandum of 5 April 1993 (Tab B) asked ODCSLOG to respond to your memorandum of March 31, 1993 (Encl to Tab B). Your memorandum requested a review and an Army position for areas of interest concerning the subject.

Not included

2. Comments are provided at Tab C.

Page 38

2 Encls

SAMUEL L. KINDRED
Colonel, GS
Chief, Aviation Logistics Office

CF:
VCSA
DALO-RMM

AMC (AMCCS) - Concur, MG J. Wilson/274-9025 (by Memo)

LTC Bailey/70487

DEPARTMENT OF THE ARMY
OFFICE OF THE INSPECTOR GENERAL
WASHINGTON, DC 20310-1700

S: 24 May 1993

SAIG-PA (36-2b) 5 April 1993

MEMORANDUM FOR DEPUTY CHIEF OF STAFF FOR LOGISTICS

SUBJECT: Draft Report on the Audit of Quality Assurance for Organic Depot Maintenance of Aircraft (Project No. 2LB-0039)

1. Enclosed is IG, DOD memorandum with draft report, for review and action. Army Regulation 36-2 requires an information memorandum alerting the Secretary of the Army and the Chief of Staff if the report contains criticism of DA policy, procedures, or practices, which may result in adverse publicity. If required, submit the information **NLT 17 April 1993.**

2. If you require input from other Army elements to formulate an Army position, request that information from those organizations by separate correspondence. Send the correspondence through internal review offices of other staff or command elements, where applicable.

3. **Address your response to IG, DOD (Auditing), and forward it through SAILE NLT 24 May 1993.** SAILE will forward the memorandum to SAIG-PA for transmission to the addressee NLT 31 May 1993.

4. IG, DOD has become very concerned about untimely responses to followup requests. If it is not possible to meet the above suspense, forward a request for extension with justification through SAIG-PA to IG, DOD immediately.

5. DODD 7650.3 requires that your comments indicate either agreement or disagreement for each finding, recommendation, or estimated monetary benefit. If you agree, describe the corrective actions taken or planned, the completion dates for actions already taken, and the estimated completion dates for the planned actions. Agreement with monetary benefits may necessitate the recovery of resources; if so, include the status of this recovery action in the DA comments. If you disagree with any of the findings, recommendations, or estimated monetary benefits, state the specific reason(s) for disagreement and provide the revised estimates of monetary or other anticipated benefits. If appropriate, you may suggest different methods for accomplishing needed improvements.

SAIG-PA (36-2b)
SUBJECT: Draft Report on the Audit of Quality Assurance for Organic Depot Maintenance of Aircraft (Project No. 2LB-0039)

6. If you desire further information, contact Ms. Flanagan at (703) 614-4646.

FOR THE INSPECTOR GENERAL:

Encl wd

SEAVY A. BANN
Colonel, IG
Chief, Operations Division

CF: (all w/encl)

SAFM-FO	SAILE
SAPA-SID	DALO-RMM
SALL	AMC (AMCIR-A)
SAAG-PRP	TRADOC (ATIR)
DACS-DM	FORSCOM (FCCS-IR)

DEPARTMENT OF THE ARMY RESPONSE TO
DODIG Draft Report No. 2LB-0039
"Quality Assurance for Organic Depot Maintenance of Aircraft"
31 March 1993

AUDIT FINDING A: Four of the five aviation depots visited either had not developed adequate quality assurance plans or had developed and implemented effective quality assurance plans for their quality assurance programs. This was caused by lack of attention to DOD guidance, confusion over whether quality assurance plans were required, and not effectively implementing TQM into the quality assurance programs. As a result, depot management had limited means for measuring the overall effectiveness of the depot maintenance quality assurance programs.

ARMY RESPONSE: Corpus Christi Army Depot (CCAD) has vigorously pursued transition to a TQM culture. This is evidenced by their training initiatives, strategic planning, certification program, and by their Quality Management Board (QMB) and Process Action Team (PAT) successes. Almost all of the senior management at CCAD has been to a Deming seminar and over 1200 supervisors and workers have been trained in TQM and SPC. More information on CCAD's TQM involvement can be obtained by contacting the Productivity Management Branch (Ms Strub), which is charged with implementing TQM at CCAD. The existing DESCOM-R 702-1 is the regulation which implements the comprehensive quality plan required by the IG.

AUDIT RECOMMENDATION A-3: We recommend that the Commanders, Army Materiel Command (AMC), Naval Air Systems Command, and Air Force Materiel Command require the aviation maintenance depots to develop and implement comprehensive quality assurance plans to be used as detailed guidance for measuring the effectiveness of product quality assurance at the maintenance depots. The plans should also address the implementation for Total Quality Management (TQM).

ARMY RESPONSE: Concur. We agree that adequate measures of effectiveness are not totally implemented, therefore, AMC will instruct Depot Systems Command (DESCOM) (by 21 May 1993) to implement comprehensive quality assurance plans to be used as detailed guidance for measuring the effectiveness of product quality assurance at the maintenance depots by 31 Aug 1993.

AUDIT FINDING B: The Military Departments did not record and track all internal quality deficiencies. Additionally, the Military Departments did not take prompt corrective and preventive actions to resolve 45 percent of the statistically selected, reported external quality deficiencies. This was caused by a lack of effective internal control procedures for identifying and reporting, analyzing and correcting, and monitoring and evaluating quality deficiencies.

As a result, opportunities to reduce rework and its related costs have been missed, and there was less assurance that safety and readiness levels were maintained.

ARMY RESPONSE: The seal problem discussed in the report has been reported to the Aviation and Troop Command (ATCOM) and CCAD is working with ATCOM to resolve the difficulty. The Maintenance Inspection Data Analysis System (MIDAS) is in the process of being replaced with a more responsive and flexible data collection system.

AUDIT RECOMMENDATION B-1: We recommend that the Commanders, Army Materiel Command, Naval Air Systems Command, and Air Force Materiel Command require the depots to develop effective internal control procedures that will provide for the prompt detection and correction of product quality deficiencies. At a minimum, such procedures should emphasize:

1. Recording and reporting internal product quality deficiencies.

2. Monitoring the status of category 1 and category 2 quality deficiencies reports to ensure prompt corrective actions.

3. Monitoring the receipt of customer exhibits to ensure that customers are reminded of the need to send them in when required. Emphasis should be placed on customers promptly returning each exhibit to the depots when requested for analyses and corrective action to be taken.

4. Analyzing and correcting product quality deficiencies promptly.

5. Performing evaluations to resolve issues that affect quality at the depots; and documenting results of the evaluations.

6. Developing procedures for sharing data within and between depots on solutions for correcting quality deficiencies.

ARMY RESPONSE: Concur. AMC will instruct DESCOM (by 21 May 1993) to correct deficiencies B-1-1, B-1-5, and B-1-6 and implement the report recommendations by 31 August 1993. AMC will instruct ATCOM in conjunction with DESCOM to jointly develop procedures addressing recommendations B-1-2, B-1-3, and B-1-4.

AUDIT RECOMMENDATION C: We recommend that the Commanders, Army Materiel Command, Naval Air Systems Command, and Air Force Materiel Command require the Military Departments' maintenance depots to:

1. Develop and maintain cost accounting systems that identify all costs of correcting quality deficiencies.

2. Reconcile costs reported in the cost accounting systems with amounts reported in the accounting system's general ledger accounts associated with the rework processes.

ARMY RESPONSE: AMC will instruct DESCOM and each depot (by 21 May 1993) to correct deficiencies noted in the report and implement the report recommendations by 30 November 1993.

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