United States General Accounting Office

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Briefing Report to the Honorable
Kay Bailey Hutchison, U.S. Senate

March 1998

# DEPOT MAINTENANCE

# Lessons Learned From Transferring Alameda Naval Aviation Depot Engine Workloads




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

National Security and
International Affairs Division

B-278920

March 25, 1998

The Honorable Kay Bailey Hutchison
United States Senate

Dear Senator Hutchison:

This report responds to your request that we review the readiness implications of moving critical maintenance workloads from closing military depots to remaining depots. Specifically, the report addresses the problems, readiness implications, and lessons learned associated with moving the engine maintenance workloads from the closing Alameda Naval Aviation Depot to the Jacksonville Naval Aviation Depot and the San Antonio Air Logistics Center.

We briefed your staff on the results of our work on November 18, 1997. This report summarizes and updates the information presented at that briefing.

## Background

The Base Closure and Realignment Commission's July 1993 recommendations for base closures and realignments included closing three of the Navy' six aviation depots. One of these was the Alameda Naval Aviation Depot, California. Accordingly, the maintenance workloads performed at those facilities were redistributed to remaining depots operated by the Navy and other services. The Alameda depot performed maintenance on the TF34 turbine engine, used by the Navy on the S-3 aircraft and by the Air Force on the A-10 aircraft, and the Navy's version of the T56 turbine engine used on C-130, P-3, and E-2 aircraft.

The Alameda workload for the TF34 engines was transferred to the Jacksonville Naval Aviation Depot, Florida, and the T56 engine workload was added to the existing Air Force T56 workload at the San Antonio Air Logistics Center, Texas. The transition of maintenance capability to these facilities began in June 1994 and was completed by May 1996.

## Results in Brief

The transfer of Alameda's depot maintenance workloads to the Jacksonville and San Antonio depots was not executed in the most efficient manner. Both receiving depots experienced production delays and increased costs, but they could not be quantified. There was an impact on reported unit readiness; however, it was not widespread. Based on the

Navy's and Air Force's experience in moving the Alameda workloads, several lessons learned have been identified to mitigate future workload transfer problems.

According to Navy and Air Force officials, the delays and increased costs were attributable to a variety of factors, including competing priorities between the gaining and losing facilities, unidentified equipment and retooling requirements, lack of spare parts in the Navy supply system, limited Air Force access to Navy parts supply system, outdated technical data, personnel and equipment certification requirements, and shortfall in skilled Alameda workers accepting transfers to the receiving depots. Air Force and Navy officials also noted that the Alameda workload transition was further complicated by the subsequent decision to close the San Antonio Air Logistics Center.

Our examination of readiness reports submitted before, during, and after the transition period for 114 Air Force and Navy units using the engines, shows that the transition problems encountered in moving the maintenance workloads to Jacksonville and San Antonio had minimal impact on equipment readiness.

Of the 57 Navy units examined, only two reported lowered equipment readiness rates based on depot maintenance problems with the transferred engines. According to Navy officials, extraordinary steps, including the removal of engines from nonoperational aircraft, were taken to minimize the impacts of transition problems on reported equipment readiness. None of the 57 Air Force units we reviewed reported adverse readiness impacts from the transition of engine maintenance workloads.

Maintenance workloads can be transitioned without impacting equipment readiness if the transition is properly planned and effectively implemented. While detailed plans were prepared to move the workloads from Alameda to Jacksonville and San Antonio, problems arose during the transitions' implementation phase. Air Force and Navy officials offered several lessons learned to mitigate these problems in future workload transitions. They included hiring key personnel in-place at closing activities to provide a more orderly transition and ensuring that all technical data, which are critical to establishing production capability and meeting production schedules, are updated and provided to the gaining activity.

Details of our work are presented in briefing sections I, II, and III.

## Conclusions and Recommendation

Both the Navy and Air Force experienced problems and difficulties in transitioning the workloads from the closing Alameda Naval Aviation Depot. Although these problems resulted in some production delays and increased costs, the impact on readiness was limited. The problems and difficulties experienced with transferring the Alameda workloads are not inherent in workload transfers and can be avoided or substantially reduced through improved planning and management. Accordingly, we recommend that the Secretary of Defense share among the military services the lessons learned from closing and transferring workloads from Alameda and other depots.

## Agency Comments

The Department of Defense agreed with our findings and recommendation (see app. I). They provided written comments dealing primarily with technical accuracy and clarification issues. We have revised the report, as appropriate, to respond to these comments.

## Scope and Methodology

We met with officials from the Office of the Secretary of Defense, the Army, the Navy, and the Air Force to identify and discuss any problems associated with the Alameda transfer and the extent they were unique or reflected systemic weaknesses associated with other prior transitions. We also interviewed former Alameda Naval Aviation Depot officials to obtain their views on the maintenance workload transfer.

We visited San Antonio and Jacksonville to document the transition experience and to solicit opinions as to what could have made the transition less of a problem to all parties concerned. Further, we obtained their assessments as to the impact of the identified problems on the maintenance workload transition.

To determine whether the problems associated with the transition from Alameda impacted the operational readiness of units in the field, we selected 114 Air Force and Navy units that used the T56 and TF34 engines before, during, and after the transition occurred. We analyzed the monthly readiness reports for 57 Air Force units and 57 Navy units from October 1993 through July 1997 to determine if any degradation in equipment readiness had been attributed to depot maintenance problems. While we have previously reported that the Department of Defense readiness reporting system lacks emphasis on long-term readiness and uses

insufficient indicators to ensure a comprehensive assessment, at the present time, it provides the best readiness data available.[1]

We conducted our review between June and December 1997 in accordance with generally accepted government auditing standards.

We are sending copies of this report to the Secretaries of Defense, the Army, the Air Force, and the Navy; the Director, Office of Management and Budget; and interested congressional committees. Copies will be made available to others upon request. If you have any questions, please contact me at (202) 512-8412. Major contributors to this report are listed in appendix I.

Sincerely yours,

David R. Warren

David R. Warren
Director, Defense Management Issues

[1]Military Readiness: DOD Needs to Develop a More Comprehensive Measurement System (GAO/NSIAD-95-29, Oct. 27, 1994).

# Contents

## Abbreviations

BRAC Base Closure and Realignment Commission

# Alameda Transition Problems

## GAO Alameda Transition to Jacksonville and San Antonio--Overall Assessment

- The transition of the engine workloads from Alameda to Jacksonville and San Antonio was not as efficient as it might have been.
- During the transfer, there were significant productivity and quality problems at the gaining facilities.

The transition of the TF34 and T56 engine workloads from the Alameda Naval Aviation Depot to the Jacksonville Naval Aviation Depot and the San Antonio Air Logistics Center, respectively, took longer than originally anticipated and was not executed in the most efficient manner. During the transfer, significant productivity and quality problems occurred at the gaining depots and the costs associated with establishing production capability were higher than expected. Neither the Air Force nor the Navy could quantify the increased costs to establish maintenance capability or the delays that the problems caused. They did, however, provide examples demonstrating the extent to which the identified problems affected cost and/or the time required to achieve production capability.

## GAO Command Support

- Competing priorities between closing and receiving activities resulted in increased time and cost in establishing production capability at gaining activities.

According to Jacksonville and San Antonio officials, a lack of coordination and cooperation with Alameda officials affected all aspects of establishing production capability at their facilities. The former Alameda commander agreed that disagreements over workload transition priorities affected establishment of production capabilities at the gaining facilities. Jacksonville and San Antonio officials stated that access to the Alameda production lines was not provided; local maintenance instructions were not shared; equipment tooling criteria were not provided; and delays occurred in shipping needed equipment from Alameda to the gaining activities. Officials from Jacksonville and San Antonio told us that there was no single focal point from which to seek assistance in resolving these differences. Jacksonville officials determined that the problems impacted both the cost and time required to establish production capability, but had not quantified these impacts.

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# Equipment Transfers

- Equipment transfer and retooling requirements were not fully identified or disclosed, resulting in gaining activities experiencing higher costs and delays in establishing production capability.

According to the former Alameda commander, representatives from all gaining activities were invited to visit Alameda, but insufficient Base Closure and Realignment Commission (BRAC) funding limited the number of site survey teams that could visit. Jacksonville and San Antonio officials told us that limited access to the Alameda production lines resulted in some equipment needed to establish production capability not being identified. For example, the Navy had developed customized equipment to perform specific processes on the Navy T56 engines. However, San Antonio officials said that they did not become aware of the special equipment requirements until after the Navy T56 production line was established at their facility. They had to then obtain the needed equipment or develop alternate procedures to accomplish the required tasks. Jacksonville officials also noted that worn production equipment transferred from Alameda required over 7,000 hours of retooling and repair to make the production line fully operational. In addition, they stated that Alameda personnel advised Jacksonville officials that some equipment already in use at Jacksonville would also satisfy repair requirements for the TF34 engines. However, Jacksonville officials discovered that their equipment had to be retooled to meet the new requirements. Jacksonville officials noted that retooling and developing work arounds resulted in higher than anticipated costs and delayed establishment of production capability.

## GAO Parts Procurement--Navy

- Shortages of repair parts at gaining activities. Navy supply system parts pipeline was inadequate, in part, because Alameda Naval Aviation Depot used commercial sources.

According to Jacksonville officials, parts from the Navy supply system were unavailable. They noted that, in some cases, the Alameda Naval Aviation Depot had used commercial sources to obtain parts. The former Alameda commander told us that when the Navy supply system was unable to satisfy their requirements, they did obtain parts from commercial sources. Since the Navy supply system is based on historical usage to meet anticipated future demands, it was not prepared to respond to Jacksonville's requests for parts that Alameda had been purchasing from commercial sources. According to the former Alameda commander, Jacksonville production managers chose not to pursue commercial solutions and, in some instances, it took up to 20 months for the Navy system to catch up with the demand.

A Jacksonville official told us that if they had been aware of Alameda's reliance on commercial sources earlier in the transition, they could have made similar arrangements to purchase parts commercially.

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# Parts Procurement--Air Force

- The Navy-managed supply system did not recognize the Air Force depot as a valid user, resulting in delays in obtaining needed parts.

According to San Antonio Air Logistics Center officials, the Navy supply system did not recognize the Air Force depot as a valid user. As a result, the depot's requests for Navy-managed T56 parts were rejected. To obtain needed parts, the Air Force depot had to circumvent the established Navy process by requisitioning parts manually (or person-to-person) rather than using the automated procedures. This caused unnecessary delays in obtaining needed parts.

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# Technical Data Transfers

- Gaining activities experienced lengthy repair times due, in part, to out of date technical data and lack of local instructions from Alameda.

According to San Antonio Air Logistics Center engine maintenance officials, depot maintenance technical data provide detailed instructions on procedures necessary to accomplish each required repair task. The technical data also identifies the type and number of parts required and dictate how often each part will be replaced during the repair process. Jacksonville and San Antonio officials told us that the technical data used by the Alameda personnel in repairing the TF34 and T56 engines had not been updated to reflect changes in procedures. For example, the technical data did not reflect current repair labor hours required to accomplish each task. San Antonio officials told us that, as a result, they underestimated the hours needed to meet established production schedules. San Antonio officials further noted that the technical data issues took an inordinately long time to solve, cost more than anticipated, and resulted in significant delays in establishing production capability. Jacksonville officials told us that the replacement frequencies (how often a part is replaced during an overhaul process) for TF34 parts were so out of date that they had to be completely revised. When requisitions were made based on the updated frequencies, the supply system was unable to meet the demand.

Jacksonville officials told us that, in addition to the technical data, Alameda employees had developed local instructions for completing some tasks. These local instructions were not provided to the gaining activities during the workload transition. As a result, the gaining activities were not aware of current procedures for performing the repairs.

## GAO Certification of Personnel and Equipment

- Requirements for gaining depots to meet other services' repair certification requirements added to delays.

According to Air Force and Navy officials the engine repair certification requirements increased the time and cost of the workload transition. The Air Force and Navy each had unique maintenance tasks to be performed on the TF34 and T56 engines, in addition to the tasks common to both services. The Air Force required 100-percent certification of all overhaul tasks, both Air Force unique and common, required on the Air Force TF34 engine and engine components at Jacksonville Naval Aviation Depot. According to Jacksonville officials, the certification should have been confined to those tasks unique to the Air Force TF34 engine. Many of the overhaul tasks required on the TF34 were already performed on other engines repaired at Jacksonville. According to Jacksonville officials, the requirement for 100-percent certification was compounded by the lack of Air Force engineering support. In contrast, the Navy required the San Antonio Air Logistics Center to certify those T56 processes that were Navy-unique. However, the Navy processes were substantially different from the Air Force processes and still caused significant delays in establishing production capability at the Air Logistics Center.

## GAO Personnel Shortfalls

- Jacksonville and San Antonio could not recruit the desired number of skilled Alameda personnel to transfer with the engine workloads; however, the shortfall did not have a significant impact on establishing production capability.

Jacksonville and San Antonio officials told us that they offered skilled personnel at Alameda opportunities to transfer with the TF34 and T56 engine workloads. However, neither facility was able to recruit the full complement of skilled personnel desired. Thirty-two of the 43 Alameda employees offered transfers to Jacksonville to work on the TF34 engines accepted the offer. Jacksonville officials told us that the shortfall of 11 employees had an impact on establishing production capability, but it was not significant. San Antonio offered transfer opportunities to 50 Alameda personnel associated with the T56 engine workload, but only 18 employees transferred. According to the former Alameda commander, more Alameda employees intended to transfer to San Antonio until they found out that San Antonio itself was targeted for closure in 1995. San Antonio officials told us that they were able to retain San Antonio personnel with the needed skills who would have otherwise been dismissed as a result of downsizing actions.

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# 1995 BRAC Decisions Complicated Ongoing Workload Transitions

- The 1995 recommendation to close the San Antonio Air Logistics Center and the Air Force's subsequent decision to compete the workload further complicated the transition of the T56 workload from Alameda.

In 1995, prior to completion of the T56 engine workload transition, the BRAC recommended that the San Antonio Air Logistics Center be closed and its workload be transferred to remaining depots or private-sector commercial activities. To mitigate the impact of the closing on the local community and center employees, the administration, in 1995, announced its decision to maintain certain employment levels at this location. Privatization-in-place was one of the initiatives to be used in achieving these employment goals. Since that decision, there has been a continuing debate between Congress and the administration over the process for deciding where, and by whom, the workloads would be performed. Based on congressional concerns raised in 1996, the Air Force revised its privatization-in-place plans to provide for competitions between the public and private sectors as a means to decide where the depot maintenance workloads will be performed. A San Antonio Air Logistics Center BRAC official told us that being placed on the 1995 closure list complicated the transition of the T56 engine workload.

# Alameda Transition Readiness Implications

## GAO Readiness Implications--Overall Assessment

- Cost increases and production delays were encountered during the transition of engine workloads; however, the impact on reported unit equipment readiness was minimized.

Both Jacksonville and San Antonio experienced higher than anticipated costs and delays in establishing production capability for the T56 and TF34 engines. However, according to the unit readiness reports we reviewed, readiness impacts were not widespread.

## GAO TF34 Transition to Jacksonville

- Unit readiness reports we examined for 27 S-3 and A-10 aircraft units showed that 2 units had periods of below mission capable rates for equipment and readiness attributed to "unavailable engines."

We examined 27 units—12 Navy and 15 Air Force—that used the TF34 engine and reported readiness during the 46-month evaluation period. We found that 2 of the 12 Navy units examined attributed periods of equipment readiness below mission capable to "unavailable engines." Both of these units reported equipment readiness as mission capable during the transition, but reported readiness levels lower than mission capable after the transition period. Although the lower readiness rates occurred after the transition, a Navy official told us that the engines were unavailable due to the transition. In addition, Navy readiness officials told us that they took extraordinary steps to maintain mission capable status. The extraordinary efforts included removing engines from aircraft in depot maintenance to use on aircraft assigned to active or reserve units.

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# T56 Transition to San Antonio

- Unit readiness reports we examined for 87 C-130, P-3, and E-2 aircraft units showed that one unit reported readiness levels lower than mission capable due to a "shortage of spare engines." It occurred prior to the transition period and lasted for 1 month.

We examined 87 C-130, P-3, and E-2 units—45 Navy and 42 Air Force—that reported readiness during the 46-month evaluation period. One of the 87 units reported engine readiness levels lower than mission capable due to a shortage of spare engines. However, this occurred prior to the T56 transition period and lasted for only 1 month.

# Alameda Transition Lessons Learned

## GAO Lessons Learned

- Ensure cooperation between gaining and losing facilities.
- Ensure adequate supply of spare parts.
- Ensure that technical data are current.
- Eliminate unnecessary certification of personnel and equipment.

Maintenance workloads can be transitioned without impacting equipment readiness if the transition is properly planned and effectively implemented. While detailed plans were prepared to move the workloads from Alameda to Jacksonville and San Antonio, problems arose during the implementation phase of the transition. Jacksonville and San Antonio officials offered several lessons learned to mitigate the implementation problems that occurred. They included the following:

(1) Placing the decision-making authority at a level above both the gaining and losing facilities would eliminate problems with competing priorities.

(2) Hiring key management and supervisory personnel from the closing facility to work-in-place until the closure occurs would provide better information on required equipment and reduce transition problems.

(3) Knowing the extent to which commercial sources are used would allow the gaining activity to contract with those vendors and obtain needed supplies until the supply pipeline catches up with the demand.

(4) Modifying the Navy's system to recognize Air Force users as valid customers would make it easier to obtain needed parts.

(5) Ensuring that all technical data, including any local instructions, are current and are provided to the gaining activity would reduce the time and cost of developing production capability for a new workload.

(6) Avoiding unnecessary requirements for certification of personnel and equipment would reduce the time and cost of developing production capability.

# Recommendation

## GAO Recommendation

- We recommend that the Secretary of Defense ensure that lessons learned from closing military depots and transferring workloads to remaining depots be shared among the military services.

We recommend that the Secretary of Defense ensure that lessons learned from closing military depots and transferring workloads to remaining depots be shared among the military services.

# Comments From the Department of Defense

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ACQUISITION AND TECHNOLOGY

Mr. David R. Warren
Director, Defense Management Issues
National Security and International Affairs Division
U.S. General Accounting Office
Washington, DC 20548

08 MAR 1998

Dear Mr. Warren:

This is the Department of Defense response to the General Accounting Office (GAO) draft report dated January 29, 1998, "DEPOT MAINTENANCE: Lessons Learned From Transferring Alameda Naval Aviation Depot Workloads" (GAO Code 709274/OSD Case 1532).

The Department of Defense does concur with the GAO recommendation. The lessons learned from closing and transferring workloads from Alameda should be shared among the military services.

The Department of Defense response to the recommendation and technical review comments are enclosed. Revisions have been suggested in the interest of accuracy and clarity.

Thank you for the opportunity to comment on this report.

Roy R. Willis
Acting Under Secretary
of Defense (Logistics)

Enclosures:
As stated

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