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Report to the Chairman, Subcommittee on Readiness, Committee on Armed Services, House of Representatives

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AIR FORCE DEPOT MAINTENANCE

More Efforts Are Needed to Improve Safety and Training

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National Security and
International Affairs Division

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May 23, 1991

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

Dear Mr. Chairman:

This report responds to your request that we evaluate the Air Force's efforts to correct maintenance training and safety problems that caused similar major accidents within a 13-month period at three Air Logistics Centers. The Air Force has taken some positive steps to resolve the problems; however, these efforts have not been fully successful or completely implemented and do not provide adequate assurance that the problems have been corrected. In addition, current oversight by the Air Force Logistics Command has not been adequate to ensure effective and efficient implementation of corrective actions.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time we will send copies to appropriate congressional committees, the Secretaries of Defense and the Air Force, and the Director of the Office of Management and Budget. We will also make copies available to others.

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

Sincerely yours,

Nancy R. Kingsbury

Nancy R. Kingsbury
Director
Air Force Issues

Executive Summary

Purpose

Similar maintenance accidents occurred at three Air Force Air Logistics Centers within a 13-month period. On July 24, 1989, a fire on a B-52 aircraft undergoing depot maintenance at the San Antonio Air Logistics Center killed 1 maintenance worker, injured 11 others, and destroyed the aircraft, which was valued at $15.7 million. Two prior nonfatal accidents at the Oklahoma City and Warner Robins Air Logistics Centers resulted in a total of $4.4 million in damages to a B-1B and a C-141 aircraft, respectively. The Chairman, Subcommittee on Readiness, House Committee on Armed Services, asked GAO to determine if the Air Force has corrected the problems that caused these accidents.

Background

The Air Force Logistics Command manages the Air Force's depot maintenance program and spends about $3 billion annually to maintain, modify, repair, and overhaul aircraft, missiles, engines, support equipment, and related parts. The Command employs about 38,000 civilians to accomplish depot maintenance at five Air Logistics Centers and other locations. The Command headquarters is responsible for formulating policy and providing review and oversight for maintenance training and safety. Each Center implements policies and programs and manages its maintenance operations. Centers are responsible for certifying that maintenance workers are adequately trained and qualified to perform specific maintenance tasks and that their work conforms with approved procedures. They are also responsible for providing safe workplaces and ensuring compliance with federal safety standards. The Occupational Safety and Health Administration, within the Department of Labor, and the Air Force inspect the Centers for compliance with federal standards and investigate major accidents. Specifically, the Administration makes inspections after accidents that result in civilian deaths or disabilities and in response to complaints filed by workers or their union.

Results in Brief

Air Force and Occupational Safety and Health Administration officials investigating the Air Logistics Center maintenance accidents found that each accident resulted from maintenance workers failing to remove vent plugs (used in testing for fuel leaks) prior to fueling the aircraft. The officials also identified many factors that contributed to the accidents, including inadequately trained and uncertified workers, poor supervision, violated procedures, and safety hazards. Some of the factors that contributed to these accidents had been previously cited during earlier internal inspections and program reviews, but corrective actions had not been implemented. For example, Air Force Logistics Command officials were aware of the problem of maintenance workers failing to remove

vent plugs before both accidents at the San Antonio and Oklahoma City Centers. Additionally, several Air Force reviews of depot maintenance activities since 1984 reported that maintenance personnel were not adequately trained or certified to perform critical tasks.

Since the accident at the San Antonio Center, the Command has initiated actions designed to correct the specific problems that contributed to the three accidents as well as improve maintenance training and certification programs. Although these actions are steps in the right direction, they have not been fully successful or completely implemented and do not provide adequate assurance that the problems have been corrected. Recent reviews by GAO and Air Force investigators indicated that untrained and uncertified workers continue to perform critical maintenance tasks and maintenance procedures continue to be violated. GAO believes that current oversight by Command officials is not adequate to ensure effective and efficient implementation of corrective actions.

Principal Findings

Results of Accident Investigations

Air Force and Occupational Safety and Health Administration officials investigated the maintenance accident at the San Antonio Air Logistics Center. Officials found that maintenance workers failed to remove the vent plug from the aircraft. This caused the fuel tank to rupture and spill fuel, which was then ignited by an unidentified source. Officials also investigated the accident at the Oklahoma City Center. They identified many contributing factors common to both accidents, in addition to maintenance workers failing to remove vent plugs. These factors included inadequately trained and uncertified maintenance workers performing critical tasks, poor supervision, violated operating procedures, and safety hazards. Occupational Safety and Health Administration officials issued notices to the San Antonio Center for 18 violations and to the Oklahoma City Center for 14 violations of federal regulations due to unsafe working conditions. Additionally, investigators identified fire and safety violations at the San Antonio Center, including potential ignition sources near the aircraft and locked gates that inhibited the fire department's access to the accident site.

Some Problems Are Not New

Some of the problems cited by the accident investigators were previously identified in internal inspections and program reviews. A 1986 report revealed that some supervisors responsible for certifying other maintenance workers were themselves inadequately trained and not

technically qualified in skill areas for which they were responsible. A February 1989 report by the Command's Inspector General, issued a few months before the accidents at the Oklahoma City and San Antonio Centers, concluded that workers may not be adequately trained and certified to perform critical maintenance tasks. To address this problem, the report recommended that the Command provide definitive program guidance and criteria to the Centers. Additionally, Air Force safety and maintenance officials said they have had concerns about problems in workplace safety, maintenance training, and certification for several years. Some stated that Air Logistics Center managers had emphasized production goals (meeting maintenance schedules) at the expense of safety and training needs.

Some Corrective Actions Have Been Taken

The Air Force Logistics Command headquarters and the Air Logistics Centers took various actions designed to correct the specific problems identified by accident investigators. For example, Center officials briefed workers and supervisors on safety issues and initiated additional training in some critical areas. Maintenance supervisors and workers reviewed training records for accuracy and assurance that certification program requirements were known and met. The Centers established certified fueling teams and revised tool controls and shift turnover procedures. They also changed operating procedures and work records to add more detail and to require verification that important work tasks and safety checks have been completed.

The Command headquarters and the Centers also began long-term efforts to improve the maintenance certification and training programs. The Command issued a new regulation on the certification program in June 1990 to improve implementation guidance to the Centers. The Command headquarters and Centers also initiated ambitious plans to improve and standardize the maintenance training program by 1995.

Recurring Problems and Concerns

Although improvements in operating procedures and safety practices have been made, problems that contributed to the accidents have been recurring. GAO's review as well as the Air Force's inspections and internal review—all made subsequent to the three accidents at the Centers—revealed that untrained and uncertified workers continue to perform critical maintenance tasks for which they are not qualified. In addition, the Centers continue to be deficient in controlling tools, following approved maintenance procedures, and properly documenting work and training records. Unsafe practices and fire hazards also continue to be problems.

The Command has not yet issued adequate guidance in some areas to ensure effective and consistent implementation of policy throughout the Command. Also, it has not adequately ensured that new policies have been implemented and that corrective actions are in place and functioning effectively. In addition, the Command's new training program is still in an early stage. Many critical issues—including the program's practicability and affordability—have not been resolved.

Recommendations

GAO recommends that the Secretary of the Air Force direct the Commander of the Air Force Logistics Command to effectively implement needed improvements in maintenance training, certification, and safety programs. These include

- providing clear guidance and procedures to managers and workers at its Air Logistics Centers and routinely monitoring and reinforcing the need for a strong and continuing commitment to safety,
- evaluating and periodically reporting to the Secretary of the Air Force on the Command's progress in correcting the problems that contributed to the accidents at each Center until all have been corrected, and
- periodically monitoring and reporting to the Secretary of the Air Force on the Command's progress in achieving timely and effective implementation of needed improvements to maintenance training and certification programs at the Centers.

Agency Comments

The Department of Defense agreed with GAO's findings and recommendations. The Department cited several actions initiated since the accidents as positive indications of the Air Force's commitment to safe working conditions at the Air Logistics Centers. A February 26, 1991, memorandum from the Air Force Secretariat tasked the Air Staff to ensure that the Commander of the Air Force Logistics Command provides clear guidance and procedures with continued emphasis on safety and training. The Secretariat will also monitor and evaluate the Command's progress in implementing safety improvements and training programs through semiannual status briefings beginning in July 1991.

The Department of Labor agreed with the information in GAO's report on the Occupational Safety and Health Administration's role and inspections at the Air Logistics Centers. The Department added that the Air Force is not in full compliance with the hazard communication standard, which requires employers to provide information and training to employees about hazardous substances in their workplace.

Contents

Abbreviations

AFB	Air Force Base
AFLC	Air Force Logistics Command
ALC	Air Logistics Center
DOD	Department of Defense
DOL	Department of Labor
GAO	General Accounting Office
OSHA	Occupational Safety and Health Administration

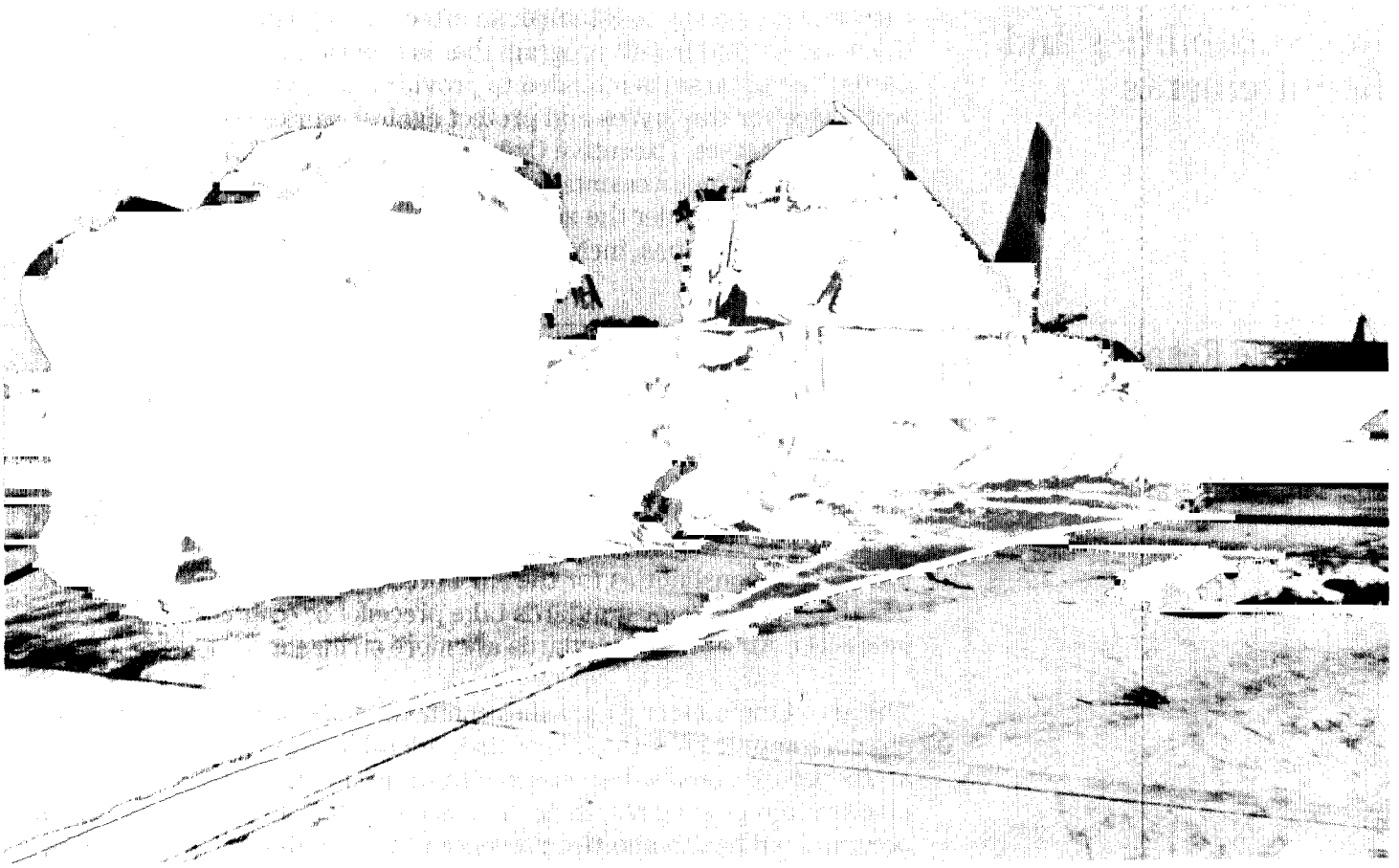
Introduction

The Air Force Logistics Command (AFLC) manages the Air Force's depot maintenance program and spends about $3 billion annually to maintain, modify, repair, and overhaul aircraft, missiles, engines, support equipment, and related parts. Within AFLC, depot maintenance work is conducted at five Air Logistics Centers (ALC) and several specialized activities. AFLC employs about 38,000 civilian mechanics, craftsmen, supervisors, managers, and support staff to accomplish depot maintenance. During fiscal year 1989, maintenance workers repaired and modified about 945 aircraft, 6,200 engines and engine modules, and 783,700 component parts.

Maintenance Accidents at Three Air Logistics Centers

On July 24, 1989, a fire at the San Antonio ALC, Kelly Air Force Base (AFB), Texas, killed 1 maintenance worker, injured 11 others, and destroyed a B-52 aircraft valued by the Air Force at about $15.7 million. Maintenance workers had failed to remove a vent plug (used in testing for fuel tank leaks) before refueling the aircraft, as required by maintenance operating procedures. This caused the fuel tank to rupture and spill fuel, which was then ignited by an undetermined source. Figure 1.1 shows the B-52 after the accident.

Figure 1.1: B-52 Destroyed by Fire at the San Antonio ALC



Source: Air Force.

The B-52 accident at the San Antonio ALC was not the first depot maintenance accident resulting from the failure of an ALC maintenance worker to remove a vent plug before fueling an aircraft. Within a 13-month period, two other similar accidents occurred. On June 28, 1988, a C-141 aircraft was damaged at Warner Robins ALC, Robins AFB, Georgia, causing about $81,000 in damages. On May 26, 1989, a B-1B aircraft was damaged at the Oklahoma City ALC, Tinker AFB, Oklahoma, causing about $4.3 million in damages. No one was injured in either of these accidents.

Maintenance Safety Responsibilities and Requirements

The Occupational Safety and Health Act of 1970 directed the head of each federal agency to establish an effective and comprehensive occupational safety and health program that is consistent with federal standards. The program is intended to provide a safe and healthful workplace for employees and protect against work-related deaths, injuries, and illnesses. Executive Order 12196 and 29 C.F.R. 1960 established specific requirements for the program. Federal safety standards also established under the act apply to all nonmilitary-unique workplaces and operations, including ALC maintenance operations.

Air Force Responsibilities

The Air Force's Occupational Safety, Fire Prevention, and Health program implements the act, executive order, and federal regulations. The Air Force develops and publishes its own standards that incorporate Occupational Safety and Health Administration (OSHA) standards. In areas in which federal standards are not established or are inadequate, the Air Force establishes its own standards. This is done in accordance with Air Force Regulation 127-12, which sets policy and assigns management responsibilities for the Air Force's occupational safety and health program. OSHA standards take precedence over the Air Force's, unless the Air Force's standards are more stringent.

The AFLC Commander establishes commandwide safety programs and directs compliance with policies and federal safety standards. The AFLC's occupational safety and health program includes inspecting workplaces and reporting results to management, coordinating efforts with occupational health and fire prevention staff, maintaining the hazard abatement system (used to report and monitor the correction of job hazards), and ensuring that accidents are investigated and reported. AFLC inspection and safety staff review and evaluate the effectiveness of the ALCs' programs and provide guidance and technical assistance to ALC safety staff.

The ALC Commander is responsible for providing a safe and healthful workplace for ALC employees and ensuring compliance with safety regulations, standards, and policies. The safety office at each ALC manages the safety programs and reports to the ALC Commander. ALC safety officials are responsible for implementing policies and standards, inspecting workplaces, and reporting and monitoring the correction of safety hazards. Additional safety personnel are located in the maintenance organization and in other ALC offices to implement safety programs, identify hazards, and ensure that operating units take needed corrective actions.

OSHA Responsibilities

Executive Order 12196 and 29 C.F.R. 1960 require the Secretary of Labor to evaluate agencies' occupational safety and health programs to determine their effectiveness. This responsibility is carried out by OSHA.

OSHA evaluates the Air Force's program by reviewing annual reports and injury and illness data and periodically conducting an evaluation to determine overall compliance with federal requirements and to recommend needed improvements. OSHA also conducts announced and unannounced inspections of all nonmilitary-unique workplaces and operations in which Air Force civilian personnel are employed, including ALCs.

OSHA's last program evaluation of the Air Force was completed in June 1987 and included visits to several ALCs. OSHA officials concluded that, overall, the Air Force's Occupational Safety, Fire Protection, and Health program was strong and of high quality, but improvements were needed in (1) inspections, record keeping, and abatement procedures for the fire prevention and health programs; (2) hazard recognition training for supervisors; and (3) interdisciplinary training for fire, safety, and health inspectors and increased emphasis on referrals among the three programs.

OSHA officials make inspections after major accidents that result in civilian deaths or disabilities and in response to complaints filed by workers or their union. OSHA may also conduct targeted inspections or program assistance visits of installations based on the comparative incidence of worker's compensation claims. When investigators find violations of federal safety standards, they issue notices of unsafe or unhealthful working conditions. Agency officials must then initiate corrective actions to resolve the problems and bring their operations into compliance with federal standards. In fiscal years 1988 and 1989, OSHA inspected AFLC bases 47 times because of accidents or in response to employee and union complaints. The results of OSHA's inspections at the ALCs are discussed in appendix I.

Maintenance Training and Certification Responsibilities and Requirements

AFLC headquarters officials develop and prescribe policies, plans, and programs and provide review and oversight for maintenance operations and training at the five ALCs. ALC officials implement Command policies and programs and manage maintenance facilities and the work force to meet production requirements. Responsibilities include recruiting, training, and managing the maintenance work force and ensuring that maintenance work is performed by qualified personnel in accordance

with regulations, technical orders (repair instructions), and operating procedures.

Although maintenance workers receive a basic orientation course, most maintenance training is provided on-the-job by first-line (immediate) supervisors and experienced workers. First-line supervisors determine training needs for workers they supervise. They must certify each worker's demonstrated proficiency in performing identified tasks. A supervisor can decertify a worker due to evidence of poor performance or for administrative reasons. Training records on each employee document completed training and identify tasks the worker is certified to perform. In addition to on-the-job training, training is also provided by local courses of instruction conducted by ALC personnel and through Air Training Command classes. Figure 1.2 depicts a training class examining B-52 aircraft parts at the San Antonio ALC.

Figure 1.2: Training Class at the San Antonio ALC

Source: Air Force.

Until a new combined regulation was issued in June 1990, the training and certification of AFLC maintenance workers were regulated by two separate but related programs: the Certification of Personnel and the Production Acceptance Certification programs. Workers are certified when they have demonstrated a technical competence to perform job

tasks and have been formally authorized to verify that the work conforms to approved maintenance procedures.

The Certification of Personnel program requires that critical maintenance tasks be performed only by qualified people who have demonstrated their skill. Failure to perform a critical task correctly can adversely impact safety or result in lost resources. A certification official (a person qualified to evaluate worker competency) must be appointed at an ALC in each of the required job skill areas, such as welding, engine testing, and fuel tank repair. The certification official is to verify worker competency through test results and/or demonstrated skill in performing critical tasks.

The Production Acceptance Certification program places the responsibility on the individual worker and work unit to certify that maintenance work conforms to all related specifications and guidelines. The program is a critical part of AFLC's quality assurance effort. It relies primarily on the worker to do quality work and has lessened reliance on production line inspections by ALC quality personnel. Under the Production Acceptance Certification program, a supervisor must ensure that a worker is trained and capable to perform a specific task. The worker is then authorized to stamp the work control document (a work record that details required work steps and safety requirements) to indicate completion of each work task and certify conformance with operating instructions and requirements. Some tasks require a "second look" (another competent individual reviews the work and also stamps the record to indicate the work was completed and met requirements). Figure 1.3 shows workers using a manometer for a B-52 wing pressurization test, which is a task requiring certification.

Figure 1.3: Production Acceptance Certification Maintenance Task

Source: Air Force.

Objectives, Scope, and Methodology

Because of his concern about the three ALC maintenance accidents, the Chairman, Subcommittee on Readiness, House Committee on Armed Services, asked us to determine if the Air Force had corrected the problems that caused these accidents. The Chairman also asked us to determine whether the ALCs have been inspected by OSHA and to identify the results of OSHA inspections. In addition, the Chairman requested that we identify the total number of ground accidents that have occurred recently within AFLC activities.

To determine whether the problems causing the three ALC maintenance accidents have been corrected, we reviewed information about the accidents and corrective actions initiated by the Air Force. As agreed with the Chairman's staff, we focused our work at the San Antonio and Oklahoma City ALCs and at AFLC headquarters. We discussed the accidents, specific problems with maintenance operations and procedures that contributed to the accidents, and corrective actions with accident investigators, maintenance managers, supervisors, workers, and OSHA officials. We also obtained applicable regulations, policies, procedures, and maintenance instructions; compared the problems identified by accident investigators with specific actions that have been taken or planned; obtained the results of internal reviews and inspections made by the Air Force before and after the accidents; and conducted limited evaluations

of judgmentally selected maintenance operations to determine compliance with procedures.

We identified factors that contributed to the accidents and evaluated the appropriateness of Air Force corrective actions using the Air Force's accident investigation reports conducted under Air Force Regulation 110-14; OSHA inspection reports citing violations of regulations; policy letters, briefing documents, and other information describing efforts to improve problems; and discussions with Air Force officials, employee union representatives, and ALC employees.

To determine OSHA's role and the results of its inspections, we reviewed legislation and federal regulations on OSHA's program requirements. We reviewed the Air Force's Occupational Safety, Fire Protection, and Health program, which implements the related federal regulations. We discussed Air Force management and compliance responsibilities with appropriate officials and obtained the Air Force's annual reports to OSHA. We met with OSHA officials at headquarters and field offices to discuss their responsibilities to evaluate ALCs. We also obtained reports and other data on the results of OSHA's inspections of AFLC bases from October 1, 1987, to June 30, 1990, which includes the dates of the three major ALC accidents, and selected some inspections for more detailed review.

To determine the total number of ground accidents within AFLC over time, we obtained data for fiscal years 1985 through 1989 from the computer data base maintained by the Air Force Inspection and Safety Center. These data included information on the numbers, categories, locations, and cost of accidents. We accepted the data as provided; we did not verify the data or the methods used to compile them. We compared the data with other information obtained at the AFLC Inspection and Safety Center and at the ALCs. Data summarizing the number and type of AFLC ground maintenance accidents are reported in appendix II.

We did our work at the Office of the Secretary of Defense, Office of the Secretary of the Air Force, and Air Force headquarters, Washington, D.C.; Air Force Inspection and Safety Center, Norton AFB, California; AFLC headquarters and AFLC Inspection and Safety Center, Wright-Patterson AFB, Ohio; San Antonio ALC, Kelly AFB, Texas; Oklahoma City ALC, Tinker AFB, Oklahoma; and OSHA offices in Washington, D.C.; Austin, Texas; and Oklahoma City, Oklahoma. We performed our work from January through December 1990 in accordance with generally accepted government auditing standards. The Departments of Defense and Labor

provided official comments on a draft of this report (see apps. III and IV).

More Efforts Are Needed to Improve Maintenance Training and Safety at the ALCs

Investigations of the three ALC maintenance accidents revealed problems in training, supervision, operating procedures, and safety. Air Force officials have initiated actions to correct these problems. However, continued recurrences of these problems indicate that more efforts are needed to ensure effective and consistent implementation of required safety, maintenance training, and maintenance certification policies and procedures. Stronger direction and oversight by AFLC headquarters are needed to provide greater assurance that similar accidents will not happen again.

Factors Contributing to Maintenance Accidents

The accidents at the San Antonio and Oklahoma City ALCs were investigated by both the Air Force and OSHA. The accident at Warner Robins ALC was investigated by the Air Force. The Air Force and OSHA investigators determined that, in addition to the primary problem of maintenance workers failing to remove vent plugs, many contributing factors were common to the accidents at the San Antonio and Oklahoma City ALCs. These included inadequately trained and uncertified maintenance workers, poor supervision, violated operating procedures, and safety hazards. OSHA officials issued notices to the San Antonio ALC for 18 violations and the Oklahoma City ALC for 14 violations of federal regulations due to unsafe working conditions.

Investigators determined that the following factors contributed to the accidents at the San Antonio and Oklahoma City ALCs:

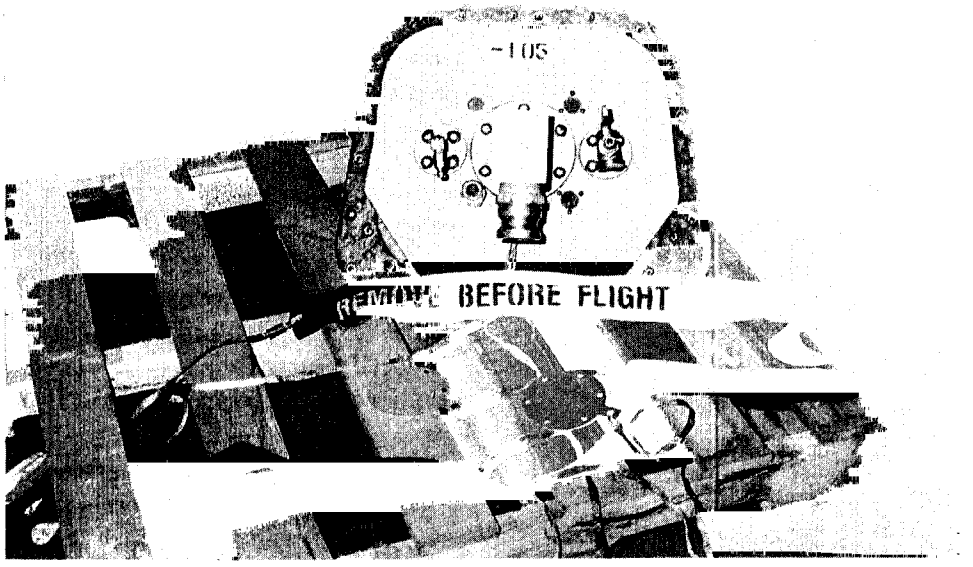
- Maintenance workers were not adequately trained and were not certified to accomplish critical fuel tank repairs and refueling tasks.
- No certifying officials were responsible for ensuring that workers were qualified to perform B-52 and B-1B aircraft fuel tank repairs.
- Supervisors did not ensure that workers were qualified to perform critical tasks. In addition, supervisors did not properly brief maintenance workers on safety requirements, specific work assignments, and the status and turnover of work from one shift to the next. It was also not clear who was in charge of the refueling operations.
- Work records used to detail required work steps and document completed tasks were incomplete and did not include all essential work steps and safety checks.
- Workers did not use the maintenance instructions in accomplishing their work or did not have copies of the required instructions available for use. B-1B maintenance instructions were not fully verified for technical accuracy and did not cover all maintenance operations.

- Tool control and accountability were deficient because required inventories were not taken and adequate visibility over equipment was not maintained. If adequate controls had been in place, vent plugs missing from the tool kits should have been noticed.

Investigators at the San Antonio ALC identified additional deficiencies, unsafe practices, and fire hazards that contributed to the B-52 accident. These factors, which are highlighted below, were not identified by the investigators at the Oklahoma City ALC:

- Maintenance workers did not follow approved maintenance procedures and installed a locally made vent plug because authorized tool kits with the approved vent plugs were not available. The locally made vent plug did not have a streamer, which alerts workers that the plug is still on the aircraft. In addition, the workers installed the vent plug in the wrong place. Figure 2.1 shows a typical B-52 vent plug with a warning streamer attached.

Figure 2.1: B-52 Vent Plug



Source: Air Force.

- The fire department was not standing by during the refueling, as required by local safety procedures. In addition, fire trucks were inhibited from reaching the accident site because entry gates to the maintenance area were locked.
- Other fire hazards and safety violations were noted, including (1) unprotected live electrical outlets in the maintenance area where the refueling

took place; (2) evidence of smoking within the restricted area surrounding the aircraft; (3) other potential ignition sources in the maintenance area, such as power generators, electrical cords, and a radio; and (4) unauthorized personnel performing maintenance on the aircraft during refueling.

Air Force officials investigated the accident at the Warner Robins ALC. They found that the maintenance workers involved in the accident were adequately trained and qualified but had not removed the vent plug. Unaware that the vent plug was still in place, the next shift of workers defueled the aircraft. The accident report also disclosed that the proper equipment needed to check for leaks was not available and that available written maintenance instructions were not adequate and were not used.

Problems Had Been Identified Before the Accidents

Some problems and deficiencies identified by Air Force and OSHA officials during the three accident investigations had been previously cited by internal inspections and program reviews. For example, reviews of the ALCs' Production Acceptance Certification program in 1984 and 1986 identified the need for more specific implementation guidance and criteria as well as the need for better identification of maintenance tasks and related training requirements. The 1986 review also reported that some supervisors who were responsible for certifying other maintenance workers were themselves inadequately trained and not technically qualified in skill areas for which they were responsible.

More specifically, a February 1989 report on the Production Acceptance Certification program by the AFLC Inspector General, issued a few months before the accidents at the Oklahoma City and San Antonio ALCs, concluded that (1) workers may not be adequately trained before being certified to perform specific tasks, (2) supervisors may not be able to ensure that workers are properly qualified, and (3) workers may be performing tasks for which they had not been certified. The report recommended that AFLC headquarters provide definitive guidance to the ALCs that defines certification tasks and training requirements, establishes training documentation guidelines, and develops certification and decertification criteria.

AFLC officials were aware of the problem of maintenance workers failing to remove vent plugs before the accidents at the San Antonio and Oklahoma City ALCs occurred. In July 1988 an AFLC safety official said he sent advisory messages about the Warner Robins accident to other

ALC safety offices. On July 7, 1989—2-1/2 weeks before the San Antonio ALC accident—the ALC Commanders were briefed on the Oklahoma City ALC accident and the problem of maintenance workers failing to remove the vent plugs. An AFLC investigating team also visited the ALCs in June and July 1989 to review management policies and practices because of the Oklahoma City ALC accident. At the San Antonio ALC, the AFLC team and ALC officials identified problems in tool control, shift turnovers, training, and personnel management. San Antonio ALC workers were briefed on the causes of the Oklahoma City ALC accident about 1 week before the accident at the San Antonio ALC.

Furthermore, at the San Antonio ALC, safety inspections dating back to 1986 identified recurring problems with maintenance workers using defective and unapproved, locally made extension cords. Fire and safety inspection reports also noted violations of smoking regulations during 1987 and 1988. Additionally, a San Antonio fire department official noted that gate access problems for emergency vehicles had been a problem for years. We found that the log of fire calls showed four separate entries in 1985 where vehicles responding to emergency calls were hampered by locked gates, which was the procedure at that time.

Air Force officials knew about shortages in trained workers, equipment, and maintenance instructions to support B-1B operations before the Oklahoma City ALC accident. Because of the extensive maintenance problems experienced on the B-1B, AFLC began depot maintenance operations at the Oklahoma City ALC about 1 year earlier than planned, even though the ALC was not well prepared to support these operations. Since a B-1B maintenance unit had not yet been established, workers were loaned from other aircraft units. A March 1989 memorandum from an ALC official identified shortages of trained maintenance personnel, support equipment, and verified repair instructions. Also, we reported[1] in 1988 that the Air Force had not received as planned the support equipment and repair instructions needed to perform B-1B depot maintenance.

Air Force safety and maintenance officials told us there has been concern for several years about the amount and quality of maintenance training within AFLC as well as safety concerns in general. Some of these officials stated that ALC managers had emphasized production goals (meeting maintenance schedules) at the expense of safety and training

[1]Strategic Bombers: B-1B Maintenance Problems Impede Its Operations (GAO/NSIAD-89-15, Oct. 24, 1988).

needs. The failure of managers to give adequate priority to safety concerns led to poor work practices. Officials told us that major accidents usually result from a breakdown in management because of a lack of emphasis on safety, poor communication of priorities, or a lack of enforcement.

AFLC officials, union representatives, and maintenance workers had also previously noted a general complacency about safety, a factor some attributed to the fact that few major accidents had occurred in recent years. Employees noted that before the San Antonio ALC accident, refueling procedures were routinely violated. There was also no list of fueling areas approved by safety officials. Hazards such as the open electrical receptacles and smoking in restricted areas were not corrected.

Air Force Has Taken Actions to Correct Problems

AFLC and ALC officials initiated various corrective actions after the San Antonio ALC accident. We believe these actions were designed to address the specific problems that contributed to the three maintenance accidents. OSHA officials determined during follow-up inspections that the specific violations cited at both the San Antonio and Oklahoma City ALCs after the accidents at these locations have been corrected. However, AFLC recognized that other improvements are needed and, as a result, implemented long-term efforts to improve maintenance training and certification programs.

Short-Term Actions

On July 26, 1989, 2 days after the San Antonio ALC accident, the AFLC Commander restricted refueling operations to the day shift until the ALCs could ensure that workers on other shifts were qualified and properly supervised. On August 25, 1989, AFLC officials directed the ALCs to review training programs and certification records. AFLC headquarters issued interim policy to the ALCs on November 29, 1989, to establish minimum shift turnover procedures, prohibit refueling in areas with unprotected electrical receptacles, require the assignment of a manager to monitor each aircraft in maintenance, and identify critical tasks on work records that require a "second look" sign-off of completed tasks. On January 17, 1990, officials directed the use of a new fuel streamer to alert workers to remove vent plugs before refueling aircraft. Additionally, in June 1990, AFLC published a regulation on the tool control and accountability program.

After the B-52 accident, the San Antonio ALC Commander and staff issued messages to maintenance personnel, emphasizing that safety and

quality were more important than meeting production goals. ALC officials (1) conducted safety awareness seminars and group discussions, (2) increased training for maintenance workers on refueling and emergency escape procedures, (3) reviewed the qualification and training documentation for workers assigned to fueling operations, (4) established certified fueling teams, and (5) appointed a certification official for B-52 aircraft fuel cell repair. Supervisors and workers reviewed training records for accuracy and assurance that certification program requirements were known and met.

San Antonio ALC officials also revised tool control and shift turnover procedures, work records, and safety checklists to include more second looks to verify that tasks were completed and require additional supervisory sign-offs on critical tasks. These officials also revised the locking procedures for the entry gates to maintenance areas to allow immediate access, surveyed maintenance pads to identify approved areas for fueling operations, and obtained approved tool kits for testing for fuel leaks.

Oklahoma City ALC officials took similar corrective actions. They briefed supervisors and workers on safety and certification procedures and reviewed training records, revised work records and safety checklists to include critical steps and second looks by qualified personnel, added personnel to assist supervisors in training and certifying workers, revised tool control procedures, implemented new work turnover policies, made technical orders more accessible, and appointed a certification official for B-1B fuel system repairs. Engineers designed a new vent plug for the B-1B that would blow off during refueling if it had not been removed.

In January 1990, at the request of the AFLC Commander, a team of safety inspectors and maintenance officials from Air Force Inspection and Safety Center headquarters and from AFLC headquarters examined safety and maintenance management practices at the San Antonio, Oklahoma City, and Ogden ALCs. An earlier review of aircraft maintenance safety had been conducted at the Warner Robins and Sacramento ALCs during August and September 1989. The internal review identified continuing deficiencies at the ALCs and made recommendations for improving safety, training and certification programs, and maintenance operations.

Long-Term Actions

AFLC has also undertaken long-term efforts to develop an improved maintenance certification program. AFLC officials issued a new regulation on the maintenance certification program in June 1990 that combined the two previous regulations on the Certification of Personnel and Performance Acceptance Certification programs. The new regulation was intended to improve implementation guidance to the ALCs by better defining terms and clarifying the relationship between job skills qualification and specific job tasks certification. To help ease the program's administrative burden and improve the accuracy of records, officials are studying ways to better automate the certification process and are adding personnel to assist supervisors in administering the program.

In addition, officials believe AFLC's traditional approach to maintenance training was flawed. Under that approach, AFLC headquarters had little involvement in the development and oversight of safety and maintenance training at the ALCs. Each ALC determined its own training requirements and developed its own courses of instruction. This approach was based on the premise that each worker assigned to a given work center was fully qualified. Maintenance training opportunities consisted mostly of on-the-job assistance or instruction with minimal formal classroom training opportunities available. AFLC officials acknowledged that accidents at the Warner Robins, Oklahoma City, and San Antonio ALCs highlighted maintenance training problems and prompted officials to develop a more comprehensive training approach.

In October 1989, AFLC instituted an industrial maintenance task force to assess maintenance and work force requirements. The task force took a "bottom-up" approach to look at specific critical and noncritical maintenance tasks, identify training requirements for each of the 200 maintenance occupational series, and develop training programs to qualify and/or certify maintenance personnel to perform the required tasks. AFLC officials began developing training courses in the more populous and critical occupations first.

Finally, AFLC officials are developing a new training program to provide a more structured and standardized training approach. This concept envisions the development of a training organization designed to provide top-quality, safe, and effective human resources to train AFLC personnel performing maintenance and other logistics activities. Under this concept, new maintenance employees would receive a mandatory orientation program as well as training in core and advanced job skills before being assigned to a maintenance unit. In its comments on this report, the Department of Defense (DOD) noted that the recent centralization of

training through the formation of the Human Resources Development Directorate at AFLC headquarters and the Human Resources Development Division at the ALCs is a positive step in management's commitment to increase AFLC's emphasis on maintenance training.

Recurring Problems and Concerns Since the Accidents

Despite the Air Force's efforts and the improvements that have been achieved, some of the safety, maintenance training, and the certification problems identified after the accidents at the Oklahoma City and San Antonio ALCs continue to occur. We also have some concerns about the timeliness and feasibility of proposed improvements in maintenance training.

Certification Requirements Have Not Been Met

To test compliance with maintenance certification program requirements, we reviewed refueling and engine start-up and testing operations on B-52 and C-5 aircraft at the San Antonio ALC and B-1B and KC-135 aircraft at the Oklahoma City ALC. Most of the operations had been accomplished between May and August 1990, about 1 year after the accidents. Many of the same problems identified by accident investigators after the Oklahoma City and San Antonio accidents continued to occur, despite efforts to resolve them. Specifically, we found examples of (1) workers performing tasks they had not been certified to perform, (2) work not properly stamped by qualified workers or supervisors, and (3) inaccurate work and certification records.

At the San Antonio ALC, we identified tasks for several B-52 refuelings and engine tests that had been stamped as completed by uncertified workers. We found that some critical tasks were not verified by the required number of certified personnel. For example, although all tasks on one safety checklist required two workers to verify completion, most tasks were stamped only once. We also found a discrepancy between two work documents. A supervisor had stamped one document while a worker stamped the other, which made it difficult to determine who actually performed the work. In addition, we found another record in which the stamp had been altered by hand, in violation of procedures. Further, we identified problems in administrative controls.

At the Oklahoma City ALC, we found one instance in which a worker performing an engine test on a B-1B was not certified. On another engine test and on a B-1B refueling operation, we found that the individuals performing the second look verifications were not properly certified.

Air Force inspectors also identified continuing problems in the maintenance certification program. The January 1990 internal review for the AFLC Commander determined that some maintenance workers were still performing tasks for which they were not certified. Among other violations, officials reported that uncertified workers were performing engine tests, flight control, and liquid oxygen servicing operations on KC-135 aircraft at the Oklahoma City ALC and were refueling B-52 aircraft at the San Antonio ALC. Additionally, at the San Antonio ALC, work certification requirements for a second look and for supervisor sign-offs were not done for about 75 percent of the tasks reviewed.

The maintenance certification program is complicated and administratively burdensome, requiring extensive record keeping and supervisory review. During our analysis of certification procedures, we found it difficult to compare employee training records and specific job tasks on work records to determine whether employees were certified to perform assigned tasks. Supervisors and workers we interviewed at various locations noted there is a need for more specific direction and guidance on how to implement certification program requirements.

The January 1990 Air Force internal review team report also cited the incompatibility between work records and training records and found the process for documenting worker qualifications to be overly complicated and confusing. The Air Force review team report stated that supervisors appeared to be overtasked and needed further clarification of their responsibilities.

We compared the new certification program regulation issued in June 1990 to the regulations in place at the time of the accidents. The new regulation improves the definitions of some key terms and better clarifies the relationship between the certification and qualification components. However, it still does not provide explicit and detailed "how-to" guidance in important areas such as defining work tasks, establishing record keeping procedures, identifying critical training requirements, determining whether job skills can be transferred from one area to another, and setting specific criteria for certifying and decertifying workers. Much of the regulation appears to be left up to the interpretation and application of individual supervisors and to each ALC. The February 1989 AFLC Inspector General report and the January 1990 internal review report both recommended that AFLC issue definitive guidance in these areas to provide for more consistent and effective implementation of the certification program throughout AFLC.

Maintenance Procedures Were Violated

On August 4, 1989, 11 days after the B-52 accident at the San Antonio ALC, a San Antonio ALC fire official observed another B-52 refueling and recorded four violations of the applicable maintenance instructions. Personnel used improper grounding techniques and allowed a generator to operate while the aircraft was experiencing a fuel leak. The pad where the refueling took place was later modified before being determined to be safe from electrical hazards.

On November 7, 1989, a fire aboard a C-5A aircraft undergoing maintenance at the San Antonio ALC injured seven employees and caused damages estimated by the Air Force to be about $9 million. Although an Air Force investigation attributed the fire to an aircraft part failure, the investigation team also found contributing factors similar to some identified in the B-52 accident. Investigators determined that workers performing operational checks had not complied with approved maintenance procedures and one worker that had never performed assigned tasks was not adequately supervised.

Quality inspectors reviewed all 597 fueling operations made at the Oklahoma City ALC between September 1989 and April 1990. They found that 31 percent of the operations did not fully comply with approved procedures. However, records indicated improved compliance during this period. The percent of fueling operations in full compliance increased from 44 percent in September 1989 to 80 percent in March 1990. Additionally, the inspectors noted that the reasons 20 percent of the March operations were not in compliance were relatively minor.

The January 1990 internal review also found that some workers did not use maintenance instructions and some did not even have them available. At the Oklahoma City ALC, inspecting officials found a majority of workers were not using required technical information, whereas others were using copied sections of instructions rather than a complete set. Supervisors explained that there was an insufficient number of instructions for every worker. At the San Antonio ALC, some personnel were observed not using technical repair instructions, whereas others were using outdated information.

For the maintenance operations we reviewed independently, we found that supervisors were complying with shift turnover procedures. Entries were appropriately recorded to report work accomplished and identify work in progress for the next shift. However, audits by quality inspectors at the San Antonio ALC in April and May 1990 identified continued problems in this area. In some instances maintenance workers failed to

record required information (such as the status of fuel tank repairs and the existence of various unsafe conditions) on the shift turnover log.

Tool Control Problems Continue

San Antonio ALC quality inspectors audited 132 tool kits between October 1989 and May 1990 and determined that 38 percent failed to meet standards. Kits failed for various reasons including tools in the kit not agreeing with the custody receipt listing, tools not marked or marked illegibly, and tools not inventoried properly.

The January 1990 AFLC internal review also documented continued problems in tool control and accountability at both the Oklahoma City and San Antonio ALCs. The reviewers reported problems such as tools not checked out properly, inventories not completed, equipment missing, tools broken or unserviceable, and tools not marked properly for identification.

Maintenance workers and supervisors at the San Antonio ALC told us that even though tool control and accountability have improved, shortcomings still exist. Although tools are now generally available when needed, workers continue to have occasional problems in obtaining required tools and equipment.

Safety Hazards Persist

We analyzed the San Antonio ALC's fuel delivery records for a 4-month period in 1990 and identified five deliveries that were made to aircraft on maintenance pads that had not been approved for fueling operations. At one refueling, fire officials did not send a fire truck to stand by during the refueling because the maintenance pad had not been approved for fueling operations. Maintenance workers went ahead and refueled the aircraft without a fire truck standing by. The ALC Commander told an OSHA official that conducting fueling operations at unauthorized locations would not happen again.

Our discussions with the San Antonio ALC fire officials and review of their records revealed that entry gate access problems also continued. Fire log entries during 1990 indicated emergency access to maintenance areas was sometimes partially blocked by B-52 and C-5 aircraft parked just inside the gates. A fire official now believes this problem has been corrected. Additionally, a tenant organization (a reserve airlift unit) periodically locked access gates without coordinating with fire protection officials.

Air Force fire and safety inspectors continued to identify the use of unauthorized and unsafe electrical cords as well as smoking within restricted areas at the San Antonio ALC. A March 1990 inspection report disclosed unauthorized smoking in an aircraft maintenance hangar and included a notation by the safety official that this is a continuous finding.

Training Concerns Exist

We are also concerned about the timeliness and feasibility of plans to improve maintenance training. Air Force officials told us that to fully implement the new human resources development training concept, they will have to determine the training needs and develop courses of instruction for about 200 occupations. This is not scheduled to be completed until 1995. AFLC officials have not yet estimated the cost of this new system but expect it to be much more than the current training program. How and if the new training program can fit into a declining logistics budget is unknown and will likely depend on the priority training is given relative to other requirements. AFLC officials noted that in the past training funds have often been reduced to meet other requirements.

Additional issues, including how well the training provided to civilian workers at the ALCs compares to the training provided to military maintenance workers in the operating commands, still need to be addressed. An official from the civilian worker's union charged that the training provided to civilian workers performing the same critical and dangerous tasks (such as refueling) is not as extensive or comprehensive as the training provided to military workers performing the same function. AFLC officials reviewed the Air Training Command fuels course provided to military personnel and developed their own course that they believe is comparable. They plan to evaluate other critical skills training courses as well. AFLC officials said they will be looking at how civilian training activities compare to military training for similar tasks as part of the new human resources development planning efforts.

Another continuing problem with maintenance training is that efforts to date have primarily focused on the training needs of new employees. AFLC officials have not yet determined what refresher and/or additional resource training will be provided to workers already employed. In its comments on this report, DOD stated that AFLC is improving training opportunities for all maintenance employees by implementing an interactive video disk training program.

Headquarters Direction and Oversight Should Be Strengthened

AFLC headquarters officials have not always taken a strong proactive role in providing definitive implementation guidance to the ALCs, evaluating the effectiveness of ALC programs, and ensuring compliance with policy. Some officials believe their role should be limited to issuing general policy, leaving the substantive implementation and evaluation responsibilities to the ALCs. For example, AFLC maintenance officials have not provided explicit "how-to" direction in the certification program guidance, despite the findings and recommendations of several inspections since 1984, including the January 1990 internal review. They expect each ALC to develop local operating instructions that will supply the needed detail and specificity.

Also, until recently, AFLC headquarters officials had not estimated the total cost of maintenance training throughout the Command, including the cost of on-the-job training. They still do not know how well expenditures and courses of instruction compare to the total training requirement. Under the current initiative to develop the human resources development concept, AFLC headquarters and ALC officials are just now beginning to comprehensively address overall maintenance training needs and evaluate the differences in training requirements and methods of instruction employed by each ALC. Except for refueling operations, they have not compared the amount and quality of training provided for civilian and military maintenance workers.

AFLC officials have not yet actively followed up to ensure that the ALCs have effectively implemented corrective actions to resolve deficiencies identified during the Oklahoma City and San Antonio accident investigations and in the January 1990 internal review. Responsible AFLC officials did not have detailed information about specific actions taken at each of the ALCs in response to the accidents. Consequently, these officials were not in a position to evaluate the effectiveness of corrective actions or ensure that efficient and effective safety, maintenance training, and certification programs are adopted throughout the Command.

Accident investigations, the results of Air Force inspections, and our review revealed that the ALCs and different supervisors within the same ALC have implemented maintenance and safety policies and procedures inconsistently and with varying degrees of effectiveness. We found several reasons why ALCs and individuals operate differently. ALC Commanders, for example, may have different priorities and management styles. Commanders and military staff also rotate to new duties frequently, and new management teams may have different priorities and operating methods than their predecessors.

Additionally, even though managers and first-line supervisors are responsible for meeting production deadlines, ensuring quality of work, and satisfying safety requirements, these demands can sometimes conflict and compete for attention. ALCs have somewhat different work loads, facilities, and work forces with varying levels of experience. ALCs that have not experienced major maintenance accidents may not demonstrate the same urgency in implementing corrective actions as those that have been rigorously scrutinized by accident investigators and other inspectors.

Some Air Force officials acknowledged that increased direction and oversight by AFLC headquarters could result in more consistent and effective implementation of Command policies and procedures at the ALCs. They believe that AFLC headquarters officials could provide a more consistent and long-term focus in maintaining a strong safety orientation throughout the Command. These officials said that a stronger central focus and more involvement from AFLC headquarters could improve the consistency of policy implementation among the ALCs. AFLC inspectors and quality assurance staff said that the seriousness and pervasiveness of the problems contributing to the three maintenance accidents indicates that AFLC needs to be involved more directly in review and evaluation efforts.

The January 1990 internal review supported the development of a stronger, more direct role for AFLC headquarters. The report concluded that the inspectors' observations were common to all or a majority of the ALCs and that AFLC headquarter's attention may be warranted. Inspectors recommended that AFLC headquarters (1) issue detailed guidance on basic supervisory responsibilities, use of technical data, and certification program requirements; (2) set specific and measurable requirements for ALC safety personnel; (3) develop a standardized data product that documents training and task certification of workers; and (4) initiate a monitoring program for safety staffing. On the basis of our work, we concur with these recommendations. AFLC officials reported that they are working to implement these recommendations.

Conclusions

Depot maintenance activities at the Air Force's five ALCs are diverse and extremely complex and detailed operations. As with other similar industrial activities, they may never be completely accident-free. Given the importance and criticality of the depot maintenance function to the successful achievement of the Air Force's mission, efficient operations and the achievement of production schedules will always be an important

measure of the success of AFLC depot maintenance operations. However, several other factors should also be considered in measuring the Command's success, including (1) having maintenance workers who are well supervised, adequately trained, and qualified to perform assigned tasks; (2) providing the required tools, equipment, technical documentation, and other resources; (3) providing a safe work environment; and (4) making workers aware of their own responsibilities to contribute toward a safe and productive workplace.

The responsibility for creating a safe depot maintenance work environment is shared by all within AFLC. We believe it would be difficult to create such an environment without a strong top-down management commitment to actively affirm safety requirements, give safety and quality equal priority to the demands for production, and provide adequate resources to implement programs and correct hazards. It would also be difficult unless effective first-line supervisors actively enforce work safety rules; identify and correct safety hazards; and ensure that workers are qualified, have the necessary training and tools to do the required work, and are kept informed about job safety and requirements. Finally, it would be difficult to create a safe depot maintenance working environment without workers that have the discipline to know and follow the rules and are trained properly in both the specific job skills needed to accomplish work tasks and in the safety skills and knowledge of workplace hazards.

Given continued occurrences of some of the same safety, maintenance training, and certification problems that have been previously identified for several years, we believe that the Air Force—including Command leadership, management, supervisors, and workers—has not done enough to create a safe depot maintenance work environment. Corrective actions have not been fully successful or completely implemented.

Although AFLC headquarters and the ALCs have made some improvements in specific areas, recurring problems and concerns indicate that several areas are still deficient, such as training, supervision, maintenance procedures, and safety. We believe that without stronger direction and improved oversight by AFLC headquarters, ineffective and inconsistent implementation of improvement efforts and the potential for major maintenance accidents in the future will continue.

Recommendations

We recommend that the Secretary of the Air Force direct the Commander of the Air Force Logistics Command to effectively implement needed improvements in maintenance training, certification, and safety programs. These include

- providing clear guidance and procedures to managers and workers at its ALCs and routinely monitoring and reinforcing the need for a strong and continuing commitment to safety;
- evaluating and periodically reporting to the Secretary of the Air Force on the Command's progress in correcting the problems that contributed to the accidents at each Center until all have been corrected, and
- periodically monitoring and reporting to the Secretary of the Air Force on the Command's progress in achieving timely and effective implementation of needed improvements to maintenance training and certification programs at the ALCs.

Agency Comments

DOD agreed with our findings and recommendations (see app. III). DOD cited various actions initiated since the accidents as positive indications of the Air Force's commitment to safe and productive working conditions at the ALCs. A February 26, 1991, memorandum from the Air Force Secretariat tasked the Air Staff to ensure that the Commander of AFLC provides clear guidance and procedures with continued emphasis on safety and training. In addition, the Air Force Secretariat will monitor and evaluate the Command's progress in implementing safety improvements and training programs through semiannual status briefings beginning in July 1991.

DOD noted other actions to correct any current deficiencies in safety or maintenance training and certification programs at the five ALCs. For example, regarding the need to improve tool control, DOD noted that the governing AFLC regulations covering tool control, Regulation 66-69, Tool Control and Accountability Program (published in June 1990), and Regulation 66-34, Depot Maintenance Plant Management (in revision during 1991), will provide better guidance and policy. Furthermore, on September 25, 1990, AFLC headquarters sent a letter to the ALCs directing the establishment of a tool control program review team. AFLC headquarters staff personnel are also working with the ALCs to develop a commandwide tool control training program to be used by the ALCs for employee training programs.

DOD commented on our finding that AFLC headquarters officials have not always taken a strong proactive role and that different ALCs and different supervisors within the same ALC have implemented maintenance and safety inconsistently and with varying degrees of effectiveness. DOD acknowledged that different management styles of ALC Commanders may have resulted in inconsistent implementation of maintenance and safety policies and procedures but pointed out that the balanced priorities of the ALC Commanders are expected to be safety, quality, and productivity. DOD noted that action has been taken to clarify policies and highlight the importance of the safety of AFLC's employees.

Finally, DOD noted that AFLC is conducting a process effectiveness review at each ALC. These reviews are designed to determine compliance with published AFLC directives and regulations. Following the last review, a single status report will be produced by October 1991, detailing actions that need to be taken to correct deficiencies found during the process effectiveness reviews.

The Department of Labor (DOL) also provided comments on a draft of this report (see app. IV). DOL stated that we had accurately characterized OSHA's role in protecting federal workers from safety and health hazards. DOL added that our report correctly describes the inspections conducted by OSHA at the ALCs between October 1987 and December 1989 and the violations found by OSHA.

Results of OSHA Inspections at the ALCs

OSHA made 47 inspections and visits to AFLC bases between October 1987 and December 1989. We selected 17 inspections of ALCs for further study. Ten of these inspections, including the inspection after the Oklahoma City ALC accident, were made as a result of complaints filed by workers or their union. Three inspections, including the one after the San Antonio ALC accident, were initiated by OSHA as a result of fatal maintenance accidents. Two were follow-up inspections to determine if previously cited violations had been corrected. The remaining two were made as a result of referrals from other sources.

These 17 inspections resulted in OSHA issuing notices to the Air Force for a total of 70 violations of federal standards, including 32 violations that were a result of the accidents at the San Antonio and Oklahoma City ALCs. OSHA indicated that the following standards had been violated:

- Executive Order 12196's general duty clause, which requires the ALC Commander to furnish employees places and conditions of employment that are free from recognized hazards that are causing or likely to cause death or serious physical harm (34 violations);
- the hazard communication standard intended to ensure that workers are informed about the chemical hazards in the workplace and the proper measures needed to prevent illnesses and injuries (13 violations);
- requirements that workers have available and properly use personal protective clothing and equipment (7 violations); and
- other safety and health standards (16 violations).

The Air Force may not be in full compliance with the hazard communication standard. Air Force and OSHA officials initially disagreed about compliance requirements for this standard; the Air Force argued that its existing Air Force standards adequately complied with the standard. However, several union complaints at AFLC headquarters and the ALCs were generated during fiscal years 1988 and 1989 as a result of the Air Force's noncompliance. According to Air Force officials, OSHA and the Air Force basically agree on how to resolve their disagreement on the compliance requirements. According to an OSHA official, the Air Force states that it has been in compliance with the hazard communication standard as of December 1990.

In its comments on this report, DOL stated that the Air Force is not in full compliance with the hazard communication standard, even though the Air Force contends that its work places are in compliance with the standard. DOL stated that OSHA's inspection data support its conclusion. OSHA conducted 31 inspections of Air Force facilities from October 1, 1987, to

June 30, 1990, and found 79 violations of this standard. Moreover, violations of this standard comprised more than one-half of all violations found by OSHA during inspections of Air Force facilities.

We reviewed the results of OSHA inspections at the San Antonio and Oklahoma City ALCs in more detail. We included in our review inspections that were made during the first 9 months of fiscal year 1990. Table I.1 shows the number of inspections at the San Antonio and Oklahoma City ALCs and the number of violations issued from October 1987 to June 1990.

Table I.1: OSHA Inspections at the San Antonio and Oklahoma City ALCs

ALC	Number of inspections	Number of inspections in which violations were cited	Total number of violations
San Antonio	17	6	40
Oklahoma City	18	11	49

Oklahoma City ALC officials reported that as of June 30, 1990, six violations had not been eliminated. These included violations of the hazard communication standard and unsafe conditions. San Antonio ALC officials said that all violations have been cleared by OSHA.

In addition to the two inspections that were a result of the vent plug accidents at the San Antonio and Oklahoma City ALCs, the following inspections were made:

- OSHA inspected the Oklahoma City ALC in February 1988 in response to a complaint regarding hazardous chemicals in a maintenance shop. Investigators issued five violations, including the exposure of workers to a carcinogen, equipment problems, and the unavailability of personal protective clothing and equipment.
- OSHA inspected the San Antonio ALC in May 1988 after a fatal accident in which an employee was crushed to death between material handling equipment and a supply bin in a supply warehouse. No violations were issued.
- Two employees were killed in July 1988 when they tried to clear a jammed degreaser machine at the Oklahoma City ALC. OSHA investigators identified 12 violations, including unsafe equipment, violated maintenance procedures, and inadequate training.

- OSHA inspected the Oklahoma City ALC three times as a result of complaints of asbestos exposure. Inspections in March and May 1989 identified six violations, whereas an inspection in January 1990 determined that the suspected material was not asbestos.
- After completing inspections in May 1989, OSHA issued notices to both the San Antonio and Oklahoma City ALCs for five violations of the hazard communication standard.
- In March and June 1990, OSHA issued notices to the Oklahoma City ALC for four violations. Platforms and stairs did not have required railings, and a grinding machine did not have a safety guard.

On the basis of their inspections at the San Antonio ALC, OSHA officials also expressed concern that managers at this ALC should enforce safety regulations better and that safety and occupational health staffs should be better trained. The officials reported in March 1990 that San Antonio maintenance safety staff had not identified significant hazards during their own inspections and did not practice effective hazard recognition and accident prevention techniques. The officials also noted that their inspectors needed better cooperation from the ALC when OSHA conducted its inspections.

AFLC Accidents

We obtained data involving on-duty ground mishaps or accidents (industrial, contractor, and vehicular accidents occurring on or off AFLC installations and involving Air Force personnel and property during the performance of officially assigned work) within AFLC for fiscal years 1985 through 1989. The data were obtained from the Air Force Inspection and Safety Center, Norton AFB, California, and included information on the numbers, types, locations, and costs of on-duty ground accidents. Table II.1 summarizes these data.

Table II.1: AFLC On-Duty Ground Accidents

Dollars in millions

Fiscal year	Accident class A[a]	Accident class B[b]	Accident class C[c]	Total number of accidents	Estimated losses
1985	4	3	960	967	$56.3
1986	2	2	888	892	4.3
1987	3	4	781	788	6.3
1988	4	4	839	847	39.1
1989	2	2	886	890	22.0
Total	**15**	**15**	**4,354**	**4,384**	**$128.0**

[a]The class A category involves a fatality, permanent total disability, property damages of $1 million or more, or destruction of an aircraft.

[b]The class B category involves a permanent partial disability, hospitalization of five or more personnel, or property damages of $200,000 or more but less than $1 million.

[c]The class C category involves an injury or occupational illness with at least 1 day away from work or property damages of $10,000 or more but less than $200,000. Estimated losses include the costs of injuries and property damages that the Air Force estimates occurs to equipment, facilities, or material resulting from the accidents.

Comments From the Department of Defense

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

PRODUCTION AND
LOGISTICS

March 22, 1991

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

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) Draft Report, "AIR FORCE DEPOT MAINTENANCE: More Efforts Needed to Improve Safety and Training," dated January 29, 1991 (GAO Code 392550; Office of the Secretarey of Defense Case 8558). The DoD generally concurs with the GAO findings and recommendations.

The report highlights the need for clarification and communication of standards, as well as improvements in training and supervision, in Air Logistics Centers. The DoD initiated a number of actions following the June 28, 1988 incident at the Warner-Robins Air Logistics Center. Those corrective actions are positive indications of the Air Force commitment to safe and productive working conditions at all Air Logistics Centers. Oversight by the Air Force Secretariat has been improved through a February 26 memorandum to the Air Staff calling for semiannual reviews covering safety, training, and certification at the Air Logistics Centers.

The detailed DoD comments on the report, findings, and recommendations are provided in the enclosure. The DoD appreciates the opportunity to comment on the GAO draft report.

Sincerely,

David J. Berteau

David J. Berteau
Principal Deputy

Enclosure

**GAO DRAFT REPORT - DATED JANUARY 29, 1991
(GAO CODE 392550) OSD CASE 8558**

"AIR FORCE DEPOT MAINTENANCE: MORE EFFORTS NEEDED TO IMPROVE SAFETY AND TRAINING"

DEPARTMENT OF DEFENSE COMMENTS

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FINDINGS

- **FINDING A: Similar Maintenance Accidents Occurred At Three Air Logistics Centers Within A Thirteen Month Period.** The GAO reported the Air Force Logistics Command manages the Air Force depot maintenance program, spending about $3 billion annually to maintain, modify, repair, and overhaul aircraft, missiles, engines, support equipment, and related parts. The GAO explained that, within the Command, the depot maintenance work is conducted at five Air Logistics Centers and several specialized activities.

  The GAO reported that, between June 1988 and July 1989, three accidents destroyed or damaged three aircraft, with total property losses of about $20 million. The GAO observed that, on July 24, 1989, a fire at the San Antonio Air Logistics Center, Kelly Air Force Base, Texas, killed one maintenance worker, injured 11 others, and destroyed a B-52 aircraft, valued by the Air Force at about $15.7 million. The GAO explained that maintenance workers had failed to remove a vent plug (used in testing for fuel tank leaks) before refueling the aircraft, as required by maintenance operating procedures. The GAO noted that the failure caused the fuel tank to rupture and spill fuel, which was then ignited by an undetermined source.

  The GAO observed that the B-52 accident at the San Antonio Air Logistics Center was not the first depot maintenance accident resulting from the failure of a Center maintenance worker to remove a vent plug before refueling an aircraft. The GAO found that, within a 13-month period, two other similar accidents occurred. The GAO reported that, on May 26, 1989, a B-1B aircraft was damaged at the Oklahoma City Air Logistics Center, Tinker Air Force Base, Oklahoma, which caused about $4.3 million in damages, while, on June 28, 1988, a

Enclosure

C-141 aircraft was damaged at Warner-Robins Air Logistics Center, Robins Air Force Base, Georgia, causing about $81,000 in damages. The GAO noted that no one was injured in either of the latter accidents. (pp. 2-3, pp. 12-13/GAO Draft Report)

Now on pp. 2-3, 8-9.

DOD RESPONSE: Concur.

- **FINDING B**: **Factors Contributing To Maintenance Accidents**. The GAO reported that the severe maintenance accidents at the San Antonio and the Oklahoma City Air Logistics Centers were investigated by both the Air Force and the Occupational Safety and Health Administration--and a similar accident at the Warner Robins Air Logistics Center was investigated by the Air Force. The GAO observed that Air Force and Occupational Safety and Health Administration investigators determined that, in addition to the primary problem of failing to remove vent plugs, many contributing factors were common in the accidents at the San Antonio and Oklahoma City Air Logistics Centers. According to the GAO, those factors included (1) inadequately trained and uncertified maintenance workers, (2) poor supervision, (3) violated operating procedures, and (4) safety hazards. The GAO noted that Occupational Safety and Health Administration officials issued notices to the San Antonio Air Logistics Center for 18 violations and to the Oklahoma City Air Logistics Center for 14 violations of Federal regulations, due to unsafe working conditions. The GAO added that investigators at the San Antonio Air Logistics Center identified additional deficiencies, unsafe practices, and fire hazards that contributed to the B-52 accident.

  The GAO further noted, however, that officials investigating the accident at Warner Robins Air Logistics Center found that the maintenance workers involved were trained and qualified--but simply had not removed the plug. According to the GAO, unaware that the vent plug was still in place, the next shift defueled the aircraft. The GAO observed that the accident report for Warner Robins also disclosed that the proper equipment needed to conduct leak checks was not available and that available written maintenance instructions were not adequate and were not used. (pp. 4-5, pp. 21-23/GAO Draft Report)

Now on pp. 3, 17-19.

DOD RESPONSE: Concur.

- **FINDING C: Problems Had Been Identified Before The Accidents.** The GAO reported that some problems and deficiencies identified by Air Force and Occupational Safety and Health Administration officials during the three accident investigations had been cited previously by internal inspections and program reviews. The GAO found that 1984 and 1986 reviews of the Air Logistics Centers Production Acceptance Certification programs identified the need for more specific implementation guidance and criteria, as well as the need for better identification of maintenance tasks and related training requirements. The GAO observed that the 1986 review also reported that some supervisors--who were responsible for certifying other maintenance workers--were, themselves, not trained adequately and were not qualified technically in skill areas for which they were responsible.

  The GAO found that Air Force Logistics Command officials were aware of the problem of failing to remove vent plugs, before the San Antonio and the Oklahoma City accidents occurred. The GAO further found that, on July 7, 1989--two and one-half weeks before the San Antonio Air Logistics Center accident--the Air Logistics Center Commanders were briefed on the Oklahoma City Air Logistics Center accident and the problem of failing to remove the vent plugs. The GAO also pointed out that San Antonio Air Logistics Center workers were briefed on the causes of the Oklahoma City Air Logistics Center accident about one week before the accident at the San Antonio Air Logistics Center.

  The GAO noted Air Force safety and maintenance officials stated there has been concern for several years about the amount and quality of maintenance training within Air Force Logistics Command, as well as safety concerns in general. According to the GAO, some of the safety officials contended that Air Logistics Center managers had emphasized production goals (meeting maintenance schedules) at the expense of safety and training needs. The GAO concluded that failure of managers to give adequate priority to safety concerns led to poor work practices. The GAO noted that, according to Air Force officials, major accidents usually result from a breakdown in management, because of (1) a lack of emphasis on safety, (2) poor communication of priorities, or (3) a lack of enforcement. (pp. 5-6, pp. 23-26/GAO Draft Report)

Now on pp. 3-4, 19-21.

DOD RESPONSE: Concur. However, action has been initiated to clarify policies and highlight the importance of safety as a management objective. DoD understands that there may be some misconceptions among some workforce members about Command priorities. But, the Air Force management team is committed to the safety of its most valuable resource--PEOPLE.

Implementation of the Production Acceptance Certification program in the Air Force Logistics Command during 1982 is another example of the Air Force commitment to produce quality products. The foundation of maintenance quality is the qualification and the certification of workers through the Production Acceptance Certification concept. Using Production Acceptance Certification ensures mechanics and technicians have been trained and have subsequently demonstrated proficiency for work they perform. The June 29, 1990 revision of the Air Force Logistics Command regulation clarified the rules for training and certification documentation and formally established the use of secondary Production Acceptance Certification for those tasks that require the "Second Set of Eyes."

Due to the diverse product lines and weapon systems, each Air Logistics Center has identified each task which is subject to the requirements established in Air Force Logistics Command Regulation 66-18, "Maintenance Certification Program." Each task is then managed at the level necessary to assure a safe, high-quality product. Additionally, the regulation requires that supervisors must be certified by Production Acceptance Certification for those tasks that they manage.

- **FINDING D**: **Air Force Has Taken Actions To Correct Problems**. The GAO found that, after the San Antonio Air Logistics Center accident, Air Force Logistics Command and Air Logistics Center officials initiated a wide range of corrective actions designed to correct the specific problems identified by accident investigators. The GAO reported, for example, that Center officials briefed workers and supervisors on safety issues and initiated additional training in some critical areas. The GAO further reported that, in addition, maintenance supervisors and workers reviewed training records for accuracy and assurance that certification program requirements were known and met.

  The GAO pointed out the Centers also established certified fueling teams and revised tool controls and shift turnover procedures--and changed operating

procedures and work records to add more detail and to require verification that important work tasks and safety checks have been completed.

The GAO further found that the Command and the Centers began long-term efforts to improve the maintenance certification and training programs. The GAO noted the Command issued a new regulation on the certification program in June 1990, and the Command and Centers began to automate the maintenance certification documentation and added personnel to administer the certification program. The GAO also reported that ambitious plans to improve and standardize the maintenance training program were initiated--with implementation planned for FY 1995. (pp. 6-7, pp. 26-29/GAO Draft Report)

Now on pp. 4, 21-24.

DOD RESPONSE: Concur. Actions taken by the Air Force Logistics Command demonstrate a firm commitment to the concept of occupational analysis for all occupations. Identification of needed support training is being made. Training is being implemented following analysis. The analysis is performed by occupational review teams, as a partnership between the functional areas and the training division. Programs and policies are evolving to improve operations safety, such as shift turnover while maintenance is being performed.

The establishment of a new shift turnover policy has:
- implemented skill turnover logs to track open and/or completed tasks;
- required an aircraft managers' log to reflect the overall and current status of the aircraft;
- established the requirement for a shift turnover meeting; and
- implemented a shift turnover form used to annotate major areas briefed during the shift turnover meeting.

All critical tasks within the areas of fuels, electric, and egress are identified on the appropriate work documents as requiring secondary Production Acceptance Certification (second set of eyes). In addition to the above, each aircraft undergoing depot level maintenance has an aircraft manager assigned responsibility for monitoring the aircraft within that manager's area of responsibility.

- **FINDING E: Recurring Problems And Concerns Since The Accidents**. The GAO found that, despite the ongoing Air Force efforts and the improvements that already have been achieved, some of the problems identified in the areas of safety, maintenance training, and

certification following the Oklahoma City and San Antonio accidents continue to occur. The GAO expressed concerns about the timeliness and feasibility of the proposed improvements in maintenance training. According to the GAO, although improvements in operating safety practices have been made, the problems that contributed to the accidents nonetheless have been recurring. The GAO noted that its review, as well as Air Force inspections and internal reviews--all made subsequent to the three accidents at the Centers--revealed that untrained and uncertified workers continued to perform critical maintenance tasks for which they were not qualified.

In addition, the GAO concluded that the Centers continued to be deficient in (1) controlling tools, (2) following approved maintenance procedures, and (3) properly documenting work and training records. The GAO further concluded that unsafe practices and fire hazards also continued to be problems.

The GAO found that, in some areas, the Command has not yet issued adequate guidance to ensure effective and consistent implementation of policy throughout the Command. The GAO also noted the Command has not followed up adequately to ensure (1) that new policies have been implemented and (2) that corrective actions are in place and functioning effectively. In addition, the GAO observed the new Command training program is still in an early stage, and many critical issues--including the practicability and affordability of the program--have not been resolved.

The GAO concluded that, given continued occurrences of some of the same safety, maintenance training, and certification problems previously identified for several years, the Air Force--including Command leadership, management, supervisors, and workers--has not done enough to create a safe depot maintenance work environment. In summary, the GAO concluded that the corrective actions have neither been fully successful nor completely implemented. (pp. 7-8, pp. 29-35, pp. 39-40/GAO Draft Report)

Now on pp. 4-5, 24-28, 30-31.

DOD RESPONSE: Concur. Although the DoD goal is to eliminate the conditions that contribute to accidents, it should be recognized that depot maintenance operations are extremely complex and very diverse and, like similar industrial facilities, may never be completely accident free. The DoD will continue a high level of emphasis on safety and training of its workforce.

Air Force maintenance training development has entered a new phase by designing training for all its maintenance personnel. Maintenance training is being developed on Interactive Video Disc, a data system interacting with a video laser disc. That type of program allows the developer to adapt the lesson to the needs or skill levels of the individual student.

Management throughout the Air Force Logistics Command is committed to increase emphasis, including resources, in support of maintenance training. Recent centralization of training through the formation of the Human Resources Development Directorate at Air Force Logistics Command and the Human Resources Development Divisions at the Air Logistics Centers, adds a positive step to that management commitment by placing emphasis on the human element in maintenance plans and programs.

Regarding tool control, the governing Air Force Logistics Command regulations covering tool control, Air Force Logistics Command Regulation 66-69 "Tool Control and Accountability Program" (published in June 1990) and Regulation 66-34 "Depot Maintenance Plant Management" (in revision during 1991), will provide better guidance and policy. On September 25, 1990, the Air Force Logistics Command Headquarters sent a policy letter to all the Air Logistics Centers, directing the establishment of a tool control program review team. In addition, Headquarters staff personnel are working with the Air Logistics Centers to develop a Command Tool Control Training Program to be used by all the Centers for employee training plans.

The Air Force Logistics Command is also conducting a Process Effectiveness Review at each of the aircraft depots. The review is a follow-on to the January 1990 inspection by the Air Force Inspection and Safety Center. It is designed to measure and evaluate the health of the safety programs at each Center, as well as maintenance certification procedures. The review will also determine the compliance with the published directives and regulations of the Command. To date, reviews have been conducted at four of the five Centers and results are being evaluated (the review at the fifth Center is in progress). Following the last review, a single status report is to be produced by October 1991, detailing what needs to be done to correct deficiencies noted.

- **FINDING F: Headquarters Officials Have Not Always Taken A Strong Proactive Role.** The GAO found that Air Force Logistics Command headquarters officials have not

always (1) provided definitive implementation guidance to the Air Logistics Centers, (2) evaluated the effectiveness of Air Logistics Center programs, and/or (3) followed up to ensure compliance with policy. The GAO noted that, at least some headquarters officials take the view their role should be limited to issuing general policy, leaving the substantive implementation and evaluation responsibilities to the Air Logistics Centers. The GAO reported Air Logistics Command headquarters officials expect each Air Logistics Center to develop local operating instructions that will supply the needed detail and specificity.

The GAO observed that accident investigations, the results of Air Force inspections, and the GAO review revealed that the Air Logistics Centers, and different supervisors within the same Air Logistics Center, have implemented maintenance and safety policies and procedures inconsistently and with varying degrees of effectiveness. The GAO found that there were several reasons why Air Logistics Centers and individuals operate differently. As an example, the GAO noted that Air Logistics Center Commanders may have different priorities and management styles. The GAO further noted that Commanders and military staff also rotate frequently to new duties--and new management teams may have different priorities and operating methods than their predecessors.

The GAO reported some Air Force officials acknowledged that increased direction and oversight by Air Force Logistics Command headquarters could result in more consistent and effective implementation of Command policies and procedures at the Air Logistics Centers. The GAO noted those officials indicated that Air Force Logistics Command could provide (1) a more consistent and long-term focus in maintaining a strong safety orientation throughout the Command and (2) a stronger central focus. The GAO also noted that more Air Force Logistics Command Headquarters involvement could improve the consistency of policy implementation among the Air Logistics Centers. The GAO added that Air Force Logistics Command inspectors and quality assurance staff maintained the seriousness and pervasiveness of the problems contributing to the three maintenance accidents indicates the Air Force Logistics Command headquarters needs to be involved more directly in review and evaluation efforts.

The GAO concluded that, although the Air Force Logistics Command and the Air Logistics Centers have made some improvements in specific areas, recurring problems and concerns indicate that several areas are

Now on pp. 29-30, 32.

still deficient--such as training, supervision, maintenance procedures, and safety. The GAO further concluded that, without stronger direction and improved oversight by Air Force Logistics Command headquarters, there will continue to be ineffective and inconsistent implementation of improvement efforts and the potential exists for major maintenance accidents in the future. (pp. 36-38, p. 40/GAO Draft Report)

DOD RESPONSE: Concur. The DoD acknowledges that different management styles of Air Logistics Center Commanders may have resulted in inconsistent implementation of maintenance and safety policies and procedures. While management styles may vary, the balanced priorities of the Air Logistics Center Commanders are expected to be safety, quality, and productivity. The Command issued a comprehensive policy on November 29, 1989, which detailed actions to update and revise regulations governing safety, quality, and production in an effort to ensure compatibility between the regulations, while incorporating existing Air Force Logistics Command and Air Force philosophies.

The Air Force Logistics Command has also been consistently proactive in the industrial environment. In March 1989, a "Tiger Team" was established to correct deficiencies in the maintenance certification program which, after visiting each Center, culminated in the revised Command Regulation 66-18 (discussed in the DoD response to Finding C). Some safety-related programs had been initiated previously (aircraft stands, worker harnesses, two-man buddy system, etc.). The primary goal of the Command is to be proactive in the prevention of (1) safety deficiencies, (2) deteriorating quality, and (3) product degradation. Although all the proactive measures may not be consistently visible, they are nonetheless the policy for doing business in the Air Force Logistics Command.

* * * * *

RECOMMENDATIONS

Now on pp. 5, 32.

- **RECOMMENDATION 1**: The GAO recommended the Secretary of the Air Force direct that the Commander of the Air Force Logistics Command effectively implement required improvements in maintenance training, certification, and safety programs. (p. 8, p. 40/GAO Draft Report)

DOD RESPONSE: Concur. On February 26, 1991, the Air Force Secretariat sent a memorandum to the Air Staff to ensure continued Air Force Logistics Command emphasis is placed on the improvement of maintenance training, certification, and safety programs. That is being accomplished through a combination of short-term actions and long-range programs under way and planned by the Command to correct its deficiencies in safety, training, and certification.

- **RECOMMENDATION 2**: The GAO recommended the Secretary of the Air Force direct that the Commander of the Air Force Logistics Command provide clear guidance and procedures to managers and workers at its Air Logistics Centers and routinely monitor and reinforce the need for strong and continuing commitment to safety. (p. 8, p. 40/GAO Draft Report)

Now on pp. 5, 32.

DOD RESPONSE: Concur. In the February 26, 1991 Air Force Secretariat memorandum, the Air Staff was tasked to ensure the Commander, Air Force Logistics Command, provides clear guidance and procedures with continued emphasis on safety and training. The Air Force Secretariat will oversee and reinforce the continuing commitment to safety, through semiannual status briefings. Those briefings will be held on a rotating basis and will consist of both formal presentations by Command officials and site visits to Center operations. The first briefing has been requested for July 1991.

- **RECOMMENDATION 3**: The GAO recommended the Secretary of the Air Force direct that the Commander of the Air Force Logistics Command evaluate and periodically report to the Secretary of the Air Force on the progress and work to correct problems contributing to the accidents at each Center until all problems have been corrected. (p. 8, p. 40/GAO Draft Report)

Now on pp. 5, 32.

DOD RESPONSE: Concur. The Air Force Secretariat will oversee and evaluate Command progress to correct the problems contributing to the accidents, until the problems have been corrected. That will be accomplished through semiannual status briefings held at the Centers on a rotating basis, with the first briefing in July 1991.

Now on pp. 5, 32.

- **RECOMMENDATION 4**: The GAO recommended the Secretary of the Air Force direct that the Commander of the Air Force Logistics Command periodically monitor and report to the Secretary of the Air Force on the progress of the Command in achieving timely and effective implementation of needed improvements to maintenance training and certification programs at the Air Logistics Centers. (pp. 8-9, p. 40/GAO Draft Report)

  DOD RESPONSE: Concur. The Air Force Secretariat will continue to monitor the implementation of the Command maintenance, training, and certification programs through the semiannual status briefings, which were requested in its February 26, 1991 memorandum.

Comments From the Department of Labor

U.S. DEPARTMENT OF LABOR

SECRETARY OF LABOR
WASHINGTON, D.C.

MAR 2 0 1991

Mr. Frank C. Conahan
Assistant Comptroller General
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Dear Mr. Conahan:

Thank you for your letter addressed to former Acting Secretary of Labor Roderick A. DeArment concerning a report entitled Air Force Depot Maintenance: More Efforts Needed to Improve Safety and Training. You requested that the Department of Labor submit written comments. We have reviewed the draft report and offer the following comments.

The GAO has accurately characterized the Occupational Safety and Health Administration's (OSHA) role in protecting Federal workers from safety and health hazards. The report also correctly describes the inspections which OSHA conducted at Air Force Logistics Centers between October 1987 and December 1989 and the violations which were found by OSHA.

Now on p. 34.

On page 42 of the report, there is a discussion of the extent to which the Air Force is in compliance with OSHA's Hazard Communication Standard, which requires employers to provide information and training to employees about hazardous substances in their workplace. The Air Force contends that its workplaces are in compliance with the standard, but the GAO report states that "The Air Force may not be in full compliance with the hazard communication standard." OSHA's inspection data support the conclusion that the Air Force is not fully in compliance with the standard. From October 1, 1987, to June 30, 1990, OSHA conducted thirty-one inspections of Air Force facilities and found seventy-nine violations of the Hazard Communication Standard. Violations of this standard comprised well over one-half of all violations found by OSHA during the inspections of Air Force facilities.

If we may be of further assistance, please have a member of your staff contact Gerard F. Scannell, Assistant Secretary for OSHA, on 523-6091.

Sincerely,

Lynn Martin

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