SECURITY AT
AIRCRAFT REPAIR STATIONS

Transportation Security Administration

Report Number: AV-2003-027
Date Issued: February 28, 2003

Memorandum

U.S. Department of Transportation
Office of the Secretary
of Transportation
Office of Inspector General

Subject: ACTION: Report on Security at
Aircraft Repair Stations
AV-2003-027

From: Alexis M. Stefani
Principal Assistant Inspector General
for Auditing and Evaluation

To: Under Secretary of Transportation for Security
Federal Aviation Administrator

Date: February 28, 2003

Reply to
Attn. of: JA-10

As part of our audit on Air Carriers' Use of Aircraft Repair Stations, we reviewed security controls at aircraft repair stations. During that portion of the audit, we identified security vulnerabilities at aircraft repair stations that we want to bring to your attention. This report transmits our results related to the objective on security controls. We will address the remaining objectives of the audit in a separate report to the Federal Aviation Administration (FAA).

Responsibilities for the Transportation Security Administration will be transferred to the Department of Homeland Security, effective March 1, 2003. The issues presented in this report will continue to be matters TSA needs to address after the transition. We are providing a copy of this report to FAA for information purposes only. An FAA response to the report is not required.

OBJECTIVE, SCOPE AND METHODOLOGY

We performed an audit of FAA's oversight of trends in repair station usage, maintenance practices, and security controls at foreign and domestic aircraft repair stations. The objective of this segment of the audit was to determine whether repair stations have controls in place to provide adequate security of aircraft and repair facilities. We performed our audit at 12 domestic and 10 foreign aircraft

are authorized to complete substantial maintenance work for the air carriers are located on general aviation airports or off airport property.

The Aviation and Transportation Security Act (Act) places responsibility for security in all modes of transportation with TSA. In carrying out this responsibility, TSA must assess threats to transportation, ensure the adequacy of security measures at airports, and work with FAA regarding any activities that may affect aviation safety or air carrier operations.

Repair stations located in foreign countries are not subject to the security requirements of the United States. The level and depth of security programs, including background checks, is subject to the requirements of the government in the country in which the repair station operates.

RESULTS IN BRIEF

Security Vulnerabilities Exist at Aircraft Repair Stations

While TSA has been working diligently to close security gaps at our Nation's commercial airports, little attention has been focused on the security of aircraft being repaired. Our audit disclosed that security vulnerabilities exist at aircraft repair stations, regardless of their location. ██████████████████████
███████████ Currently, there are no Federal requirements for repair stations located on general aviation airports or off airport property to implement security programs. These repair stations are not required to implement procedures to safeguard the aircraft or aircraft parts being repaired or to conduct background investigations, including criminal history records checks, of employees completing the repairs.

Because all repair stations located on general aviation airports or off airport property may not perform work that would put aircraft at risk, TSA needs to work with FAA to conduct risk-based security assessments that would identify which repair stations pose the greatest security risk. For example, repair stations that repair fuel pumps may not be as susceptible to sabotage as repair stations that overhaul airframes. TSA must ensure that repair stations have the level of security consistent with the significance of the work performed.

Repair stations we reviewed that were located on commercial airport property had better security measures in place; however, we did find security weaknesses at

these facilities as well. We identified weaknesses in controls at repair stations intended to prohibit unauthorized access to the airport. For example, we found gaps and holes in perimeter fencing and gates. We also found that, although all repair station ██

Foreign repair stations are not subject to Federal regulations, so it is incumbent on the air carriers themselves to ensure their aircraft are adequately secured at these repair stations. To illustrate the significance of the need to address security at foreign repair stations, we note that in December 2001 a senior aircraft technician at a foreign repair station was found to be a member of the terrorist organization Al Qaeda. Based on Singapore Government reports and our interviews with repair station representatives, the aircraft technician photographed U.S. aircraft as potential targets for a terrorist attack. Our review at foreign repair stations identified security weaknesses such as poor perimeter fencing and hangar doors left open and unattended. Closing the security gap at these facilities is imperative because foreign repair stations perform overhauls and repairs on engines and airframes for the major air carriers.

Currently, oversight by TSA has generally focused on passenger and baggage screening at U.S. commercial airports. However, as TSA closes the security vulnerabilities in these areas, those intent on harm will seek out less secure areas from which to mount an attack, such as aircraft repair stations. TSA must assess the security threat and where needed, expand its security coverage to cope with the evolving threat at these facilities.

RECOMMENDATIONS

TSA must work to ensure measures are taken to provide reasonable levels of security for U.S. aircraft being repaired at U.S. and foreign aircraft repair facilities. We recommend that TSA:

- Work with FAA to conduct risk-based security assessments of repair stations on general aviation airports and off airport property to identify which repair stations pose the greatest security risk;

- Require security programs (including background investigations and criminal history records checks for employees) for all repair stations located on general aviation airports and off airport property, based on the results of the risk assessments;

- Require background investigations, including criminal history records checks, of all employees at repair stations on commercial airports;

- Require air carriers to develop a process for ensuring that facilities repairing their aircraft, particularly those in foreign countries, have security measures in place to safeguard their aircraft; and

- Work with the Department of State, foreign governments, the International Civil Aviation Organization, and other appropriate international organizations to address security concerns identified at foreign repair stations.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On February 20, 2003, we provided a discussion draft report to TSA's Policy Office. On February 27, 2003, TSA provided the following comment.

> The Policy office takes no issue with the essence of the report since it highlights vulnerabilities in the transportation system that do need mitigation. However, no part of the Department of Transportation, neither FAA nor TSA, has ever been required by law to regulate aircraft repair stations for security if they do not reside within the boundaries of a commercial airport. The recommendations as presented thus far would require a major planning, evaluation and outreach effort. The recommendations would at least double the number of U.S. airports currently regulated for security. TSA does not appear to have that authority at present. There are several associations that represent various portions of the aircraft repair industry, which is a very broad and diverse industry that runs the gamut from "mom and pop" operations to major multinational companies. TSA would need to understand the repair station industry before establishing policies that would impose security programs and other requirements.

We agree that there is no specific requirement in the Act for TSA to assume responsibility for security at aircraft repair stations. However, according to the Act, TSA is currently given the responsibility for "security in all modes of transportation." As part of this responsibility, TSA should "assess threats to

transportation" and "oversee the implementation, and ensure the adequacy, of security measures at airports and other transportation facilities." The vulnerabilities we identified at aircraft repair stations illustrate an evolving threat to aviation security, which falls under the broad language in the Act to "assess threats to transportation." We are recommending that TSA conduct risk-based security assessments as a first step in determining the extent of actions required by TSA with respect to repair station security. We are requesting that TSA provide written comments to the final report that detail actions to be taken on our recommendations.

PRINCIPAL RESULTS

Security at Aircraft Repair Stations Needs to Be Strengthened

Currently, repair stations on general aviation airports and off airport property are not required by law or regulation to have security measures in place. Yet, there are over 4,100 repair stations on general aviation airports or off airport property, which account for approximately 92 percent of all aircraft repair stations in the United States.

Repair stations on general aviation airports and off airport property are commonly used by major air carriers to complete critical aircraft maintenance work. In fact, approximately 64 percent of repair stations that are authorized to complete substantial maintenance work for major air carriers are located on general aviation airports or off airport property. While these facilities complete critical repairs for the air carriers, there is no mechanism in place to ensure the integrity of the employees performing the work or that the aircraft or aircraft components being repaired are safeguarded from unauthorized access.

Repair stations on commercial airports fall under the airport operator's security program. However, based on the weaknesses we identified, the airport operators' oversight of these security programs must be strengthened to prevent breaches of security. For example, we identified weaknesses in perimeter access controls, controls over access to secured areas of the airport, and written procedures for security, as well as a ████████████████████████████

Security at General Aviation Airports Needs to Be Strengthened

Over 600 domestic repair stations are located on general aviation airport property, but tenants on these airports have not been required to implement security programs. TSA must work to close this gap in security by ensuring repair stations have measures in place to safeguard the aircraft or aircraft parts they are repairing and to validate the integrity of the people performing the repairs.

Heightened security awareness at these facilities is imperative because repair stations on general aviation airports perform critical aircraft repairs for the major air carriers. For example, a repair station on a general aviation airport in ▮▮▮▮▮ ▮▮▮▮▮▮▮▮ performs heavy maintenance checks (i.e., complete teardowns and inspections) on major U.S. air carriers' aircraft, including Northwest, Southwest, and United Airlines. Another repair station on a general aviation airport in Kansas completes engine overhauls and repairs for seven of the major air carriers, including Delta, America West, American and Continental. However, because repair stations located on general aviation airports are not required to have security programs, they are not obligated to ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮ or develop written security procedures to safeguard the aircraft and aircraft parts they repair.

Security vulnerabilities we identified at repair stations located on general aviation airports include:

→ *Ineffective access controls that could allow unauthorized individuals to gain access to the aircraft and airfield.*

→ *Inadequate security of the aircraft being repaired.*

→ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

The first line of defense in protecting aircraft on airports is to ensure that unauthorized individuals do not gain access to the airport property. However, we found that perimeter access controls at general aviation airports need to be improved. For example, at the repair station we visited on a general aviation airport in ▮▮▮▮▮▮▮▮▮, we observed a gap between the gate of the facility and perimeter fencing. As illustrated in Figure 1, this gap was large enough for an adult male to enter the facility.
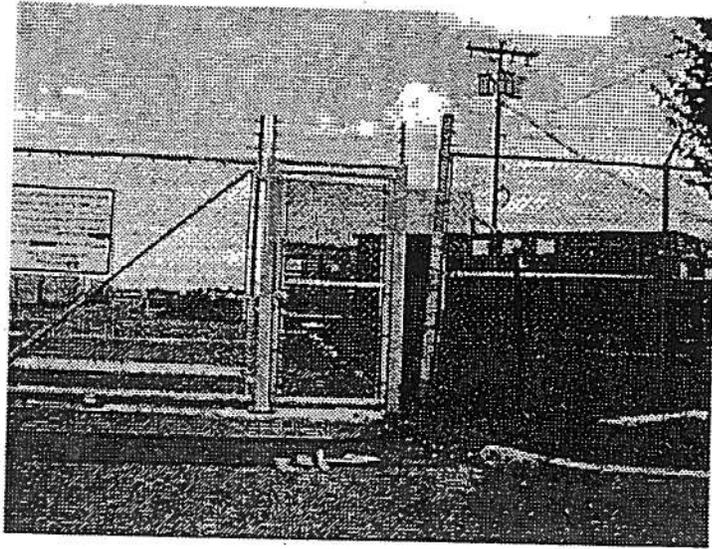
Figure 1. *Gap Between Gate and Perimeter Fencing*

In addition to poor perimeter access controls, we also found that employees at this facility were not subject to criminal history records checks. Over 1,200 mechanics and inspectors had direct access to major air carriers' aircraft and could gain access to the aircraft and airfield. However, none of these mechanics and inspectors were subject to criminal history records checks.

Additionally, we identified inadequate controls over the aircraft being repaired at the ████ facility. For example, we found a major air carrier's aircraft left open and unattended. On three occasions, the audit team was able to drive a vehicle onto the repair station property and approach parked, unattended aircraft without authorization. On one occasion, we boarded an open and unattended major air carrier aircraft, as shown in Figure 2.

Figure 2. *Team Member Boarding Unattended Major Air Carrier Aircraft*

Section 101 of the Act empowers TSA to "assess threats to transportation" and to "oversee the implementation, and ensure the adequacy, of security measures at airports...." To address the vulnerabilities we identified at repair stations on general aviation airports, TSA should work with FAA to conduct risk-based security assessments at these facilities. Based on the results of the assessments, TSA should determine the level of security that is needed to correspond to the significance of the work performed. TSA should require repair stations on these airports to develop and implement security programs consistent with the criticality of the work performed. These security programs should require background investigations, including criminal history records checks, of the repair stations' employees.

Repair Stations Located Off Airport Property Need Better Security Awareness

Over 3,500 domestic aircraft repair stations (78 percent of all repair stations) are located off airport property, but they have not been required to implement security procedures to safeguard the aircraft or aircraft parts being repaired. While some of these repair stations only perform repairs on small parts that would not be likely targets for sabotage, others repair critical aircraft parts for commercial air carriers. For example, one repair station we visited at a remote facility in ███ repairs landing gear and airframes for at least three major air carriers. All repair stations performing these types of critical repairs should implement some form of security

program, including criminal history records checks of their employees. However, we found that other than ███ ██ ██████████████████████████ Of the eight repair stations we visited off airport property, █████ did not require criminal history records checks on their employees.

To determine which repair stations located off airport property pose the greatest security risk, TSA should work with FAA to conduct risk-based security assessments at these facilities. Based on the results of the risk assessments, TSA should ensure that aircraft repair stations have a level of security that corresponds to the criticality of the work performed. For example, repair stations that only repair fuel pumps may not be as susceptible to sabotage as repair stations that complete engine overhauls. Repair stations that perform critical aircraft repairs would require more comprehensive security measures, such as subjecting all employees to background investigations including criminal history records checks, than repair stations that do not perform critical repairs.

While not all repair stations need a security program as comprehensive as those located on airports, all repair stations should, at a minimum, provide security awareness training to their employees. Increased security vigilance could be accomplished at these facilities through educational efforts by TSA or repair station operators. For example, the Act requires flight schools to conduct security awareness training for their employees to increase their awareness of suspicious circumstances and activities of individuals. A similar type of training could be effective for repair station employees.

Commercial Airport Operators Must Strengthen Their Oversight to Ensure Repair Stations Comply With Security Requirements

Currently, there are approximately 380 domestic aircraft repair stations located *on commercial airport property*. As a tenant on the airport, the repair station must comply with the airport operator's security program that has been approved by TSA. Employees at these repair stations must undergo background investigations and criminal history records checks if they are granted unescorted access to the secured areas of the airport.

Our review found security vulnerabilities at repair stations on commercial airports such as poor perimeter access controls, ineffective controls for monitoring an individual's movement once on airport property, insufficient procedures to ensure

the safety and integrity of individuals performing repairs, and outdated written security procedures.

Some of the most glaring deficiencies at repair stations on commercial airports were found in perimeter access controls. TSA requires airport operators to establish measures to prevent and detect unauthorized entry into secured areas of the airport. However, we identified inadequate perimeter fencing (gaps in fence and overgrown vegetation) as well as unmonitored entrance points into repair stations. Figure 3 illustrates how an unauthorized individual could gain access to the repair station. Once in the repair station, an individual could easily gain access to aircraft being repaired and onto the airfield of the airport.
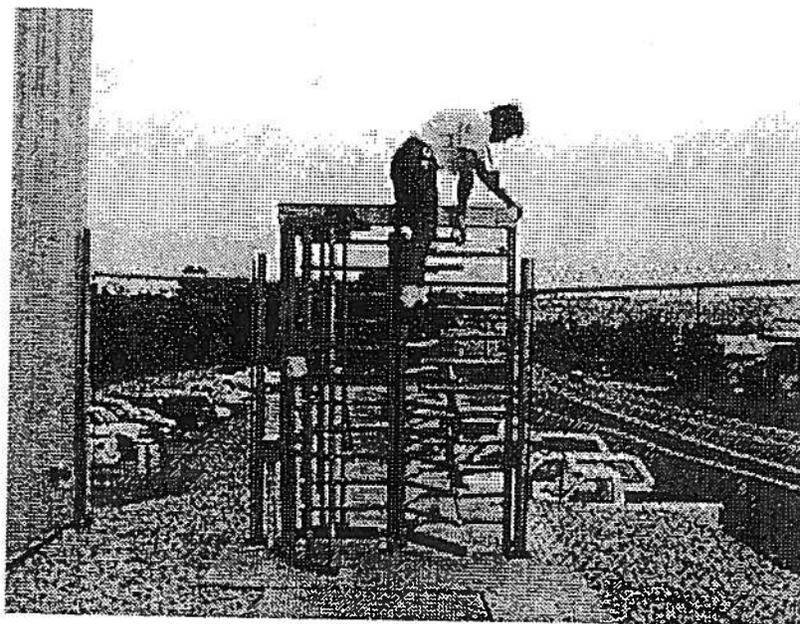

Figure 3. *Turnstile Intended to Deter Unauthorized Access to the Repair Station Could Be Circumvented*

Our review of security at repair stations located on commercial airports also identified ineffective controls for monitoring movement of personnel once on airport property. For example, we identified two maintenance trucks used for driving to and from the secured areas of the airport that had removable repair station logos on the doors to distinguish them from unauthorized vehicles entering the active terminal ramp. With these logos, any vehicle could gain access to the terminal property because there were no further check points beyond the repair station property. Upon inspection of the two vehicles, we found the trucks unsecured, with keys easily accessible and extra repair station logos inside the trucks.

We also determined that repair stations on commercial airports are not required to ensure the integrity of individuals performing repairs, unless the individuals have been granted unescorted access to secured areas of the airport. For example, at one repair station in North Carolina, we determined that 448 of the 548 mechanics (82 percent) working on major air carrier aircraft were not subject to background investigations, including criminal history records checks. However, these employees had routine access to the aircraft and, because of the physical location of the repair station on the airport, could easily gain access to the airfield.

In addition, we found that some repair stations on commercial airports did not update written security procedures. For example, we identified a security manual at a repair station in North Carolina that had not been updated since September 11th. While the airport operator may have developed new procedures at this airport, the repair station had not revised its manual to reflect the new procedures. At another repair station in Texas, the airport operator had not supplied the repair station with the security standards for tenants on airport property. These weaknesses occurred because the airport operator did not provide adequate oversight of its tenants' security procedures.

Commercial airport operators must develop and implement security programs that provide a secure operating environment for passenger aircraft. However, based on the weaknesses we identified, airport operators have not paid sufficient attention to the oversight of their security programs, particularly at airport tenant facilities such as repair stations. We have provided TSA with details on the airports where we identified the specific weaknesses identified above. TSA must work with airport operators to strengthen access control points and assess the security measures at repair stations located on airport property. TSA has indicated it will soon issue regulations that will enhance security of tenants. However, TSA must move forward with developing and executing a standard security program for tenants, including requiring repair stations to verify employee integrity and ensuring the repair stations have current written security procedures on hand.

Foreign Repair Stations Should Strengthen Security Awareness

Foreign repair stations also perform critical aircraft repairs for the major air carriers. For example, repair stations in Brazil and France perform engine overhauls and repairs for America West, Delta, Northwest, Southwest, and US Airways. While repair stations on foreign airports are not subject to the security procedures developed by TSA, we did identify weaknesses at foreign repair

stations that perform significant maintenance work for U.S. air carriers that should be addressed, such as:

- Perimeter fencing with gaps and overgrown vegetation;

- Nonoperational surveillance equipment to monitor ramp activity; and

- Contract personnel granted access to the aircraft and airport. For example, cleaning and vending machine representatives were granted the same type of security clearances as maintenance personnel, thus allowing these individuals, who typically work at odd hours of the day, access to aircraft at the facility or on the airfield.

Because U.S. Government officials cannot impose U.S. security regulations on foreign entities, a combination of measures may be needed to enhance the security of U.S. aircraft operating overseas. TSA should require air carriers to develop a process, such as modifying existing contractual arrangements, to ensure that repair stations they use have security measures in place to safeguard their aircraft. Additionally, TSA should work with the Department of State, foreign governments, the International Civil Aviation Organization, and other appropriate international organizations to address security concerns at foreign repair stations.

The security vulnerabilities we identified at repair stations on general aviation and commercial airports, off airport property, and in foreign countries indicate that TSA should take action to address this segment of the aviation industry. While we do not know the true extent of the security risks at aircraft repair stations, neither does TSA.

RECOMMENDATIONS

We recommend the Transportation Security Administration:

1. Work with FAA to conduct risk-based security assessments of repair stations on general aviation airports and off airport property to identify which repair stations pose the greatest security vulnerabilities.

2. Require security programs (including background investigations and criminal history records checks for employees) for all repair stations located on general aviation airports and off airport property, based on the results of the risk assessments.

3. Require background investigations, including criminal history records checks, of all employees at repair stations on commercial airports.

4. Require air carriers to develop a process for ensuring that facilities repairing their aircraft, particularly those in foreign countries, have security measures in place to safeguard their aircraft.

5. Work with the Department of State, foreign governments, the International Civil Aviation Organization, and other appropriate international organizations to address security concerns identified at foreign repair stations.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On February 20, 2003, we provided a discussion draft report to TSA's Policy Office. On February 27, 2003, TSA provided the following comment.

> The Policy office takes no issue with the essence of the report since it highlights vulnerabilities in the transportation system that do need mitigation. However, no part of the Department of Transportation, neither FAA nor TSA, has ever been required by law to regulate aircraft repair stations for security if they do not reside within the boundaries of a commercial airport. The recommendations as presented thus far would require a major planning, evaluation and outreach effort. The recommendations

would at least double the number of U.S. airports currently regulated for security. TSA does not appear to have that authority at present. There are several associations that represent various portions of the aircraft repair industry, which is a very broad and diverse industry that runs the gamut from "mom and pop" operations to major multinational companies. TSA would need to understand the repair station industry before establishing policies that would impose security programs and other requirements.

We agree that there is no specific requirement in the Act for TSA to assume responsibility for security at aircraft repair stations. However, according to the Act, TSA is currently given the responsibility for "security in all modes of transportation." As part of this responsibility, TSA should "assess threats to transportation" and "oversee the implementation, and ensure the adequacy, of security measures at airports and other transportation facilities." The vulnerabilities we identified at aircraft repair stations illustrate an evolving threat to aviation security, which falls under the broad language in the Act to "assess threats to transportation." We are recommending that TSA conduct risk-based security assessments as a first step in determining the extent of actions required by TSA with respect to repair station security.

ACTION REQUIRED

Please provide your response to the Department of Homeland Security, Office of Inspector General within 30 days. If you concur with our recommendations, please indicate for each recommendation the specific actions taken or planned and the target dates for completion. If you do not concur, please provide your rationale. Furthermore, you may provide alternative courses of action that you believe would resolve the issues presented in this report.

We appreciate the courtesies and cooperation of Transportation Security Administration representatives during this audit. If you have any questions concerning this report, please call me at (202) 366-1992 or David A. Dobbs, Assistant Inspector General for Aviation Audits, at (202) 366-0500.

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EXHIBIT A. SCOPE AND METHODOLOGY

We performed an audit of FAA's oversight of trends in repair station usage, maintenance practices, and security controls at foreign and domestic repair stations. This report represents our results related to the objective on security controls. We will address the other objectives of the audit in a separate report to FAA.

We performed our audit at 12 domestic and 10 foreign aircraft repair station facilities located on commercial and general aviation airports, and off airport property. Of the 22 repair stations visited, 9 were on commercial airport[1] property, 1 was on general aviation airport property, and 12 were off airport property. We selected geographical regions to review that had a large concentration of repair stations. We then selected repair stations based on the type of work performed and the amount of work performed on U.S. air carrier aircraft.

The Office of Inspector General contracted with ████████████████ ████████ to conduct maintenance and security assessments at 12 of the aircraft repair stations we selected for review. ████████ conducted on-site assessments to verify the adequacy of security procedures in place at eight foreign and four domestic aircraft repair stations. In addition to the repair stations visited by ████████ the audit team conducted a limited review of security procedures at 10 repair stations. Exhibit B contains a list of the repair stations visited during the audit. Audit work was performed from February to November 2002. We conducted the audit in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States, and included such tests of procedures, records, and other data as warranted.

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[1] For purposes of this report, commercial airports are those covered under Title 49 Code of Federal Regulations, Part 1542, "Airport Security". This regulation governs the operation of airports regularly serving scheduled passenger operations, public and private charter passenger operations, and foreign air carrier operations.

Exhibit A. Scope and Methodology

EXHIBIT B. REPAIR STATIONS VISITED

<u>Domestic Aircraft Repair Stations:</u>

<u>Foreign Aircraft Repair Stations:</u>

Exhibit B. Repair Stations Visited