Office of Inspector General

Audit Report

Runway Incursion Program

Federal Aviation Administration

Report Number AV-1998-075
Date Issued: February 9, 1998

Memorandum

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

Subject: ACTION: Report on Audit of the Runway Incursion Program, FAA Report No. AV-1998-075

Date: February 9, 1998

Reply to Attn of:

From: Lawrence H. Weintrob
Assistant Inspector General for Auditing

To: Federal Aviation Administrator

This is our report on the audit of the Runway Incursion Program, Federal Aviation Administration (FAA). We are providing this report for your information and use. A synopsis of the report follows this memorandum.

On November 7, 1997, we discussed the results of our audit with officials from Air Traffic Services, Airports, Regulation and Certification, and Research and Acquisitions. We considered their verbal comments in preparing this report.

On November 13, 1997, we provided testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives on the results of our audit. The testimony, issued as Report No. AV-1998-015, included eight recommendations to improve the Runway Incursion Program. In a December 11, 1997 memorandum, the Director of Air Traffic detailed specific actions taken or planned in response to the eight recommendations. The actions taken or planned are responsive to the audit recommendations, and the recommendations are considered resolved subject to the followup provisions of Department of Transportation Order 8000.1C.

We request that FAA provide a written response to address the two issues included in the "Other Matters" section of this report.

We appreciate the cooperation provided during the audit. If you have questions or need further information, please contact me at 366-1992 or Alexis Stefani, the Deputy Assistant Inspector General for Aviation, at 366-0500.

Attachment

Runway Incursion Program

Federal Aviation Administration

Report No. AV-1998-075 February 9, 1998

Objective

The audit objective was to evaluate the adequacy of the Federal Aviation Administration's (FAA) efforts to meet its goal of reducing runway incursions.

Background

FAA defines a runway incursion as "any occurrence at an airport involving an aircraft, vehicle, person, or object, on the ground, that creates a collision hazard or results in loss of separation with an aircraft taking off, intending to take off, landing, or intending to land." FAA's definition applies only to airports with operating air traffic control towers.

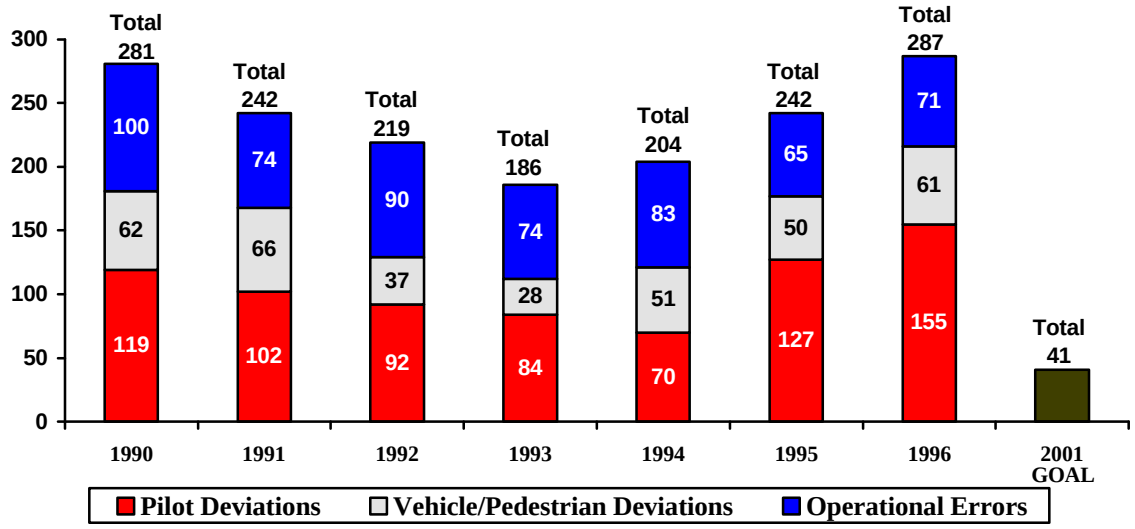
Runway incursions can have serious consequences. Since 1972, 11 runway accidents claimed 719 lives and destroyed 20 aircraft. Since 1990, 4 major runway accidents claimed 45 lives.

In January 1991, FAA developed a Runway Incursion Plan following a runway accident in Detroit and a record 281 runway incursions in 1990. In April 1995**,** FAA revised the plan and issued a Runway Incursion Action Plan, which included 22 runway incursion projects. The new plan identified a goal of reducing runway incursions to 56 by the year 2000, an 80 percent reduction from the 1990 high of 281. In 1997, FAA set a new goal to reduce runway incursions to 41 in 2001, an 80 percent reduction from 204 occurrences in 1994.

Results-in-Brief

From 1993 through 1996, runway incursions have increased 54 percent from 186 to 287, as shown in the following chart. This trend continued upward in 1997. In the first 9 months of 1997, runway incursions increased 12 percent from the first 9 months of 1996. Complete 1997 data are not available until the end of February 1998.

Runway Incursions By Type[1]
1990 - 1996



The increase in the number of runway incursions from 1993 to 1996 was primarily caused by pilot deviations: errors by a pilot such as failing to stop short of an active runway. In 1996, general aviation aircraft were involved in 72 percent of the pilot deviations. From 1993 to 1996, the rate of runway incursions per 100,000 airport operations also increased from .30 to .46.

If the upward trend continues, increases in air traffic, through normal expansion and the introduction of the Free Flight Concept, could intensify the safety risk at airports. Using satellite technology, Free Flight will allow for more efficient spacing or metering of arriving aircraft to airports, thus, increasing the activity on the runways.

To reverse the trend is a challenge involving many groups. The Runway Incursion Program crosses FAA organizational lines, which necessitates extensive coordination. Air Traffic, Airports, Flight Standards and Acquisition staffs have a role in reducing incursions. Reducing runway incursions also involves pilots, air traffic controllers, airport operators, aviation organizations, and airlines.

Solutions to prevent runway incursions are both systemwide and local. Systemwide solutions include technology enhancements to aid controllers or pilots in decisionmaking or to warn them of potential incursions, and nationwide educational efforts aimed at reducing pilot deviations. Two acquisitions FAA currently has in process will assist air traffic controllers in

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[1] Runway Incursions are classified into three categories: Pilot deviations, operational errors, and vehicle or pedestrian deviations.

preventing runway accidents: the Airport Surface Detection Equipment, Model 3 radar; and the Airport Movement Area Safety System, a system to provide controllers with automated alerts and warnings of potential runway accidents.

Solutions to prevent runway incursions can also be local or airport-specific in nature. Local projects can be as simple as painting a concrete surface green like grass to prevent airplanes from taxiing on the area, placing warning lights at runway intersections, and providing tower controllers with warning lights to remind them which runway is in use.

We found the 1995 Runway Incursion Action Plan, designed to coordinate runway incursion prevention and reduction activities and initiatives, is not working as intended. The team assigned to implement and coordinate the 22 runway incursion projects listed in the 1995 plan was never formed. Regional officials we visited were not familiar with the plan, or with FAA's goal to reduce runway incursions by 80 percent. FAA has only completely implemented 1 of 10 recommendations made by a consultant in 1994 and 1996 to reduce pilot deviations on the runway, which accounted for 54 percent of the runway incursions in 1996. Lastly, the $74.1 million Airport Movement Area Safety System, originally scheduled to be implemented in 1996, is now scheduled to be completely installed in August 2000.

Additionally, we found that regional offices did not focus their efforts on airports with the most runway incursions. The regional offices visited did not (1) have a person designated to identify the causes of runway incursions at local airports or (2) periodically analyze runway incursion data for their airports.

Recommendations

To reverse the upward trend in runway incursions, FAA must have a strong Runway Incursion Program to solve systemwide problems and expedite solutions. At the local level, FAA needs to have a more focused Runway Incursion Program. We recommend that FAA:

- assign specific responsibility for implementing the Runway Incursion Action Plan,
- disseminate local initiatives that work nationwide,
- increase focus on projects to reduce pilot deviations,
- improve runway incursion data,
- establish regional focal points to oversee runway incursion activities and implement airport-specific action plans when needed, and
- use NASA's runway transgression data to aid in identifying potential problem airports.

Management Position

In a December 11, 1997 memorandum, FAA agreed to implement all eight recommendations by the end of 1998. FAA plans to:

- develop a new Runway Incursion Action Plan, with industry input, which will include measurable goals and accountability both at headquarters and regional levels,
- establish regional participation in the Runway Incursion Program to focus on local runway incursion prevention activities and coordinate with the headquarter's Runway Incursion Program Office,
- coordinate regional efforts to reduce runway incursions with the Runway Incursion Program Office for sharing with other regions,
- increase focus on projects to reduce pilot deviations including educating the general aviation pilot population, and
- improve runway incursion data and use NASA runway transgression data to aid in identifying potential problem airports.

Office of Inspector General Comments

FAA's planned actions are considered responsive to our recommendations. Therefore the recommendations are considered resolved, subject to the followup provisions of Department of Transportation Order 8000.1C.

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I. INTRODUCTION

Background

The Federal Aviation Administration (FAA) defines a runway incursion as "any occurrence at an airport involving an aircraft, vehicle, person, or object, on the ground, that creates a collision hazard or results in loss of separation[2] with an aircraft taking off, intending to take off, landing, or intending to land." FAA's definition applies only to airports with operating air traffic control towers.

Human error, rather than equipment failure, is the primary cause of runway incursions. Runway incursions are classified into three categories: pilot deviations, operational errors, and vehicle or pedestrian deviations.

- PILOT DEVIATIONS are errors by a pilot that violate Federal Aviation Regulations. For example, a pilot fails to follow air traffic controller instructions to stop short of an active runway, causing another aircraft to abort its departure or arrival.

- OPERATIONAL ERRORS are occurrences attributable to air traffic control that result in less than the required separation between aircraft.

- VEHICLE or PEDESTRIAN DEVIATIONS involve the presence of vehicles, non-pilot operated aircraft, or pedestrians in runways or taxiways without authorization from a controller.

Runway incursions can have serious consequences. Four major runway accidents since 1990 claimed 45 lives. In January 1991, FAA developed a Runway Incursion Plan following an accident in Detroit and a record number of runway incursions in 1990. The plan was a result of an April 1990 report by the Associate Administrator for Aviation Safety which recommended a more centralized approach for addressing the runway incursion problem. The plan included 45 procedural and acquisition projects to prevent runway incursions.

In April 1995, FAA revised the plan and issued a Runway Incursion Action Plan. The new plan identified nine program goals and related objectives addressing airport surface movement, safety, capacity, and efficiency. One goal was to reduce runway incursions by 80 percent by the year 2000 from the

[2] A loss of separation means that aircraft involved in the incident were closer than allowed by air traffic requirements.

1990 high of 281. The Runway Incursion Program Manager said that in 1997, FAA revised its goal. The new goal was to reduce runway incursions by 80 percent from 204 occurrences in 1994 to 41 by the year 2001. A Surface Movement Team was to coordinate the 22 projects included in the 1995 plan. Exhibit A shows the status of the 22 projects as of November 1997.

Prior to Fiscal Year (FY) 1997, Congress appropriated $282 million for runway incursion projects. An additional $26.6 million was appropriated in FY 1997, and $21.8 million was appropriated in FY 1998. Exhibit B summarizes the appropriations for runway incursion projects.

The Runway Incursion Program Manager in the Office of Air Traffic Service, Air Traffic Operations Program[3] is responsible for coordinating FAA's activities to reduce runway incursions. This includes providing direction, guidance, and oversight to those responsible for research, development, and acquisition of surface movement products.

Objective, Scope, and Methodology

The audit objective was to evaluate the adequacy of FAA's efforts to meet its goal of reducing runway incursions. The audit covered runway incursion activities during 1994, 1995, and 1996. In addition, data from prior years were used to identify runway incursion trends. The audit was made in accordance with the Government Auditing Standards prescribed by the Comptroller General of the United States and included such tests as considered necessary in the circumstances.

The audit was conducted from October 1996 through September 1997. We held discussions with FAA officials at Headquarters; Eastern, Great Lakes, and Western Pacific Regions; Flight Standards District Offices; and airport officials at the 12 airports visited. We also held discussions with the National Transportation Safety Board (NTSB), MITRE Corporation, aviation organizations, and Battelle Incorporated, the contractor for the National Aeronautics and Space Administration's (NASA) Aviation Safety Reporting System. Exhibit C lists organizations contacted or visited.
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3 Prior to April 1996, the program was managed by a Runway Incursion Program Manager in the Office of System Architecture and Program Evaluation.

The audit evaluated FAA's procedures and accomplishments in (1) identifying the primary causes of runway incursions; (2) defining, identifying, and targeting airports with numerous incursions; (3) establishing project priorities; and (4) assessing the effectiveness of projects and implementing those projects determined to be beneficial.

We reviewed FAA runway incursion statistics and goals, and evaluated the oversight, coordination, and implementation of the 1995 Runway Incursion Action Plan. We tested the accuracy of runway incursion data by comparing data to reports of runway incidents obtained at field offices visited. We evaluated the process used for reporting and recording runway incursions and for identifying and taking corrective action at airports with high incidences of runway incursions. We compared airports identified by FAA as having the most runway incursions from 1994 through 1996 to runway transgression data in NASA's Aviation Safety Reporting System. Also, we reviewed the funding and status of runway incursion projects. Finally, we determined whether FAA's Runway Incursion Program was in compliance with the Government Performance and Results Act of 1993.

Prior Audit Coverage

From 1991 to 1995, the General Accounting Office issued five annual reports entitled "Air Traffic Control, Status of FAA's Modernization Program." The reports identified cost overruns and schedule slippages in the Airport Surface Detection Equipment, Model 3 (ASDE-3) radar, which is designed to provide tower controllers with surveillance information on aircraft and vehicles on the runways and taxiways in all weather conditions. No recommendations were made to FAA.

In September 1996, the General Accounting Office issued a report entitled "Aviation Safety: FAA Generally Agrees With but Is Slow in Implementing Safety Recommendations" (Report No. GAO/RCED-96-193). The General Accounting Office reviewed FAA's implementation of seven NTSB recommendations on runway safety and found that actions on four of five closed recommendations were not completed. The General Accounting Office recommended that FAA periodically monitor the implementation of critical safety recommendations and the actions needed to fully resolve the problem. Also, the General Accounting Office recommended that FAA report the status of implementation of critical safety recommendations to Congress and the agency that made the recommendations. FAA concurred in part with the recommendations and stated that the implementation of safety measures that are developed in response to the NTSB recommendations are closely monitored. FAA stated that although a new reporting system is not necessary,

it would provide whatever information Congress requests. The General Accounting Office accepted FAA's response and considered the recommendations closed.

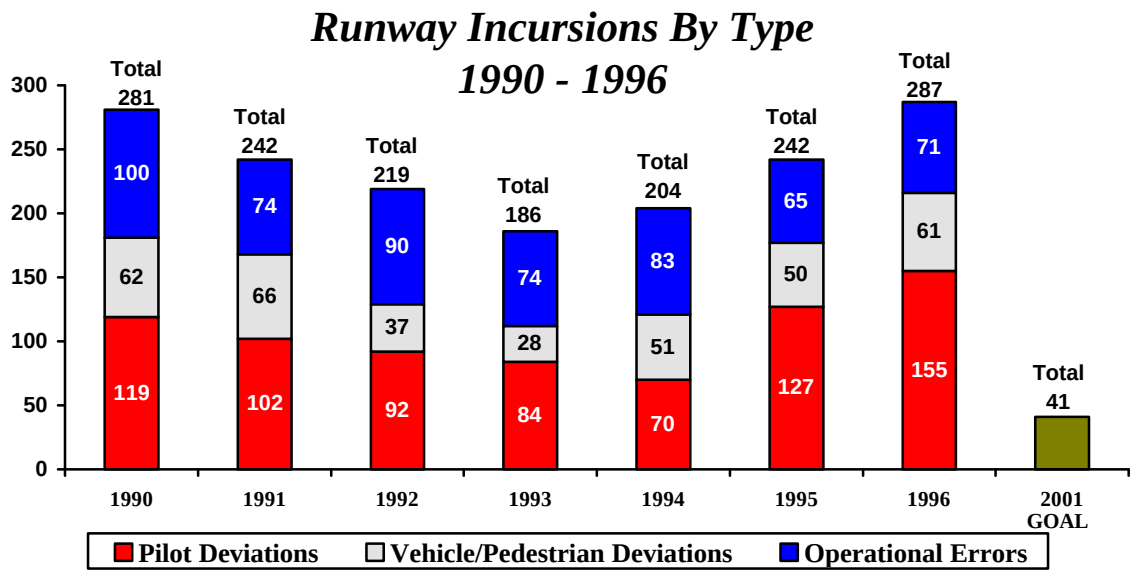
II. FINDING AND RECOMMENDATIONS

Finding: FAA's Runway Incursion Program Needs to be Strengthened

FAA's Runway Incursion Program has not been effective in reducing runway incursions. Although FAA developed runway incursion plans in 1991 and 1995 to implement and coordinate projects to reduce runway incursions, (1) runway incursions increased 54 percent over a 4-year period, from 186 incursions in 1993 to 287 in 1996, and continued to increase in 1997; (2) the 1995 plan, which contained 22 systemwide projects to reduce runway incursions, was not working as intended; and (3) regional offices did not focus their efforts on local solutions to identify and correct airport-specific problems. If the upward trend continues unchecked, increases in air traffic, through normal expansion and the introduction of the Free Flight Concept[4], could intensify the safety risk at airports. Without improvements in the Runway Incursion Program, it is unlikely FAA will achieve its goal of reducing runway incursions to 41 by the year 2001.

Continued Increases in Runway Incursions

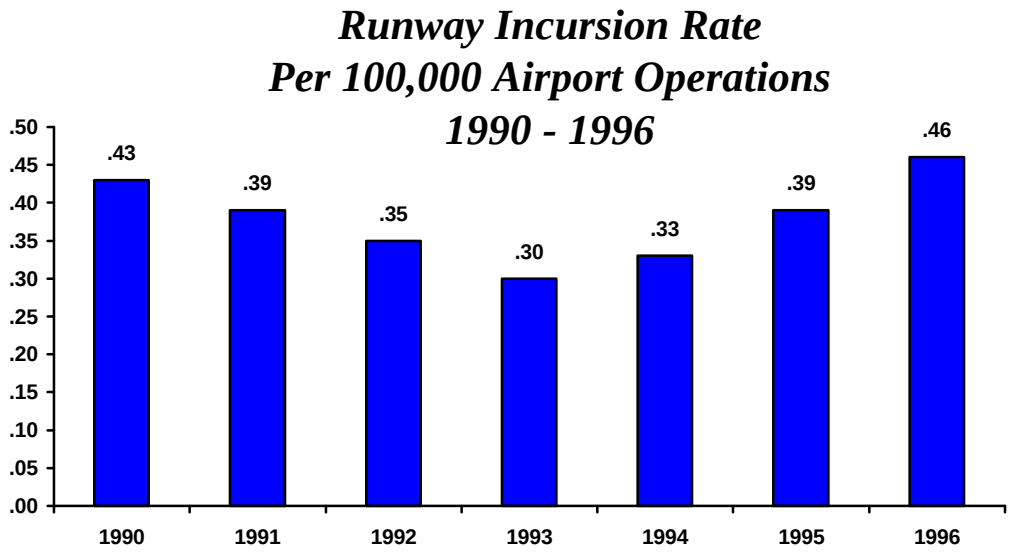
From 1993 through 1996, runway incursions have increased 54 percent from 186 to 287, as shown on the following chart.



[4] The Free Flight concept would allow pilots to fly user-preferred routes, if they can do so safely, given air traffic and airport capacity constraints.

While FAA's goal is to have only 41 incursions by the year 2001, the trend is going in the opposite direction. The 287 incursions in 1996 are seven times the current goal of 41 and the upward trend is continuing. In the first 9 months of 1997, there were 234 runway incursions, a 12 percent increase over the 209 incursions that occurred during the first 9 months of 1996.

The rate of runway incursions has also increased in relation to the number of airport operations. FAA's data indicates that runway incursion rates increased from .3 per 100,000 airport operations in 1993 to .46 in 1996, as shown on the following chart.



Without Actions Runway Incursions Will Increase In the Future

FAA is concerned about the increases in runway incursions and potential accidents. In the April 1997 Systems Engineering Management Plan for the Runway Incursion Reduction Program, FAA expressed concern that the continued upward trend in runway incursions increases the probability of a runway accident. FAA noted that the worst commercial accident in aviation history occurred on the runway when two B-747's collided at Tenerife on March 27, 1977, claiming 583 lives. FAA also noted that 11 runway accidents since 1972 claimed 719 lives and destroyed 20 aircraft.

FAA forecasts that total aircraft operations will increase from 124 million in 1996 to 133.7 million in 2008. Using satellite technology, FAA may be able to accommodate at least some of the increase in operations by reducing separation requirements for aircraft approaching an airport. However, this could transfer congestion to the surface operations as aircraft operations

increase, making the reduction of runway incursions an even more challenging effort.

In addition to FAA's concerns, NTSB has expressed concern about the increasing number of runway incursions. In April 1997 testimony before the Committee on Appropriations, Subcommittee on Transportation, the NTSB Chairman recognized that runway incursions have increased 19 percent from 1995 to 1996 and expressed concerns about the progress being made by FAA in addressing the collision risks associated with runway incursions. The Chairman stated that the installation of airport runway collision avoidance systems is on the Board's "Most Wanted" list of recommendations to be implemented.

Systemwide Solutions to Runway Incursions Need to Be Implemented

Solutions to the runway incursion problem involve numerous organizations within FAA, as well as the aviation community. Within FAA, Airports, Air Traffic, Flight Standards, and Acquisition staffs may be involved in finding and implementing systemwide runway incursion solutions. Because the incursions may be caused by various factors, such as human error or airport design, different organizations may need to be involved to prevent their occurrence. These groups include pilots, controllers, airport operators, airlines, and other aviation organizations.

FAA developed runway incursion plans to coordinate systemwide solutions. FAA's 1991 Runway Incursion Plan called for a more centralized approach for addressing the runway incursion problem. Coordination of initiatives within FAA and the aviation community was determined to be vital to the plan's success. In April 1995, FAA revised the plan and issued a Runway Incursion Action Plan. Again, coordination of initiatives was the purpose of the plan.

The April 1995 plan contained 22 systemwide projects addressing human performance, communications, guidance, surveillance, and surface traffic management. The systemwide projects included procedural improvements, such as developing land and hold short procedures and updating lighting standards. The plan also included projects for new technologies to prevent runway accidents. Two major projects were the ASDE-3 radar and the Airport Movement Area Safety System (AMASS), designed to assist controllers in identifying and preventing potential runway accidents.
Our review of the effectiveness of the 1995 Runway Incursion Action Plan determined that the plan is not working as intended. We found:

- projects in the plan to reduce runway incursions should be implemented.

- Local initiatives to reduce runway incursions need to be coordinated with the Runway Incursion Program Manager at FAA Headquarters and other regions and airports.

- FAA needs to increase its focus on reducing pilot deviations; a significant systemwide problem.

- FAA's database on runway incursions and the related causes contained inaccuracies and could be enhanced.

- The development and installation of major technology to aid controllers in preventing runway accidents has been slow.

Specific Program Responsibilities Need to be Implemented

An FAA team was to implement and coordinate the 22 systemwide projects included in the 1995 Runway Incursion Action Plan within FAA and the aviation industry. However, the team was never formed. The former Runway Incursion Program Manager stated that the Surface Movement Team was not formed due to the lack of funding. Quarterly status reports containing action item accomplishments and future plans were not prepared. Consequently, documentation was not readily available to determine the status of the 22 projects in the 1995 Runway Incursion Action Plan and whether established deadlines were met.

We requested the Runway Incursion Program Manager to provide a current status of the 22 projects in the 1995 Runway Incursion Action Plan. After an extended effort, FAA provided us with the status of the projects. As shown in exhibit A, 8 projects were completed, 4 were dropped, and 10 are ongoing as of November 1997.

In addition to the lack of specific program responsibilities, we found a lack of awareness of the Runway Incursion Program at the regional level. During our work at FAA's Eastern, Great Lakes, and Western Pacific Regions, we found that Headquarters had not coordinated the 1995 Runway Incursion Action Plan with the regional offices. As a result, regional officials were not familiar with the Runway Incursion Action Plan, the FAA goal for reducing runway incursions, or even FAA's definition of runway incursions.

Local Initiatives Should Be Disseminated to Others

Local initiatives to reduce runway incursions at airports were usually not shared with the national Runway Incursion Program Manager. No requirement existed for FAA regional offices to advise the Runway Incursion Program Manager of local runway incursion projects. Further, no mechanism was in place to disseminate information of such initiatives to other FAA regions or local airport authorities.

The following examples illustrate such initiatives.

- A contractor was developing a state-of-the-art vehicle management system for Minneapolis-St. Paul Airport using Differential Global Positioning System technology. Neither the FAA Air Traffic Manager at Minneapolis-St. Paul Airport nor the Runway Incursion Program Manager was familiar with this project, which may help reduce vehicle-related incursions.

- Tower controllers at McCarran International Airport in Las Vegas, Nevada, placed markers on their workspaces to remind them when a runway was being occupied.

- Los Angeles International Airport added in-pavement lighting, added signage, and painted certain concrete surfaces green to prevent airplanes from taxiing on the areas.

Increased Focus Needed on Reducing Pilot Deviations

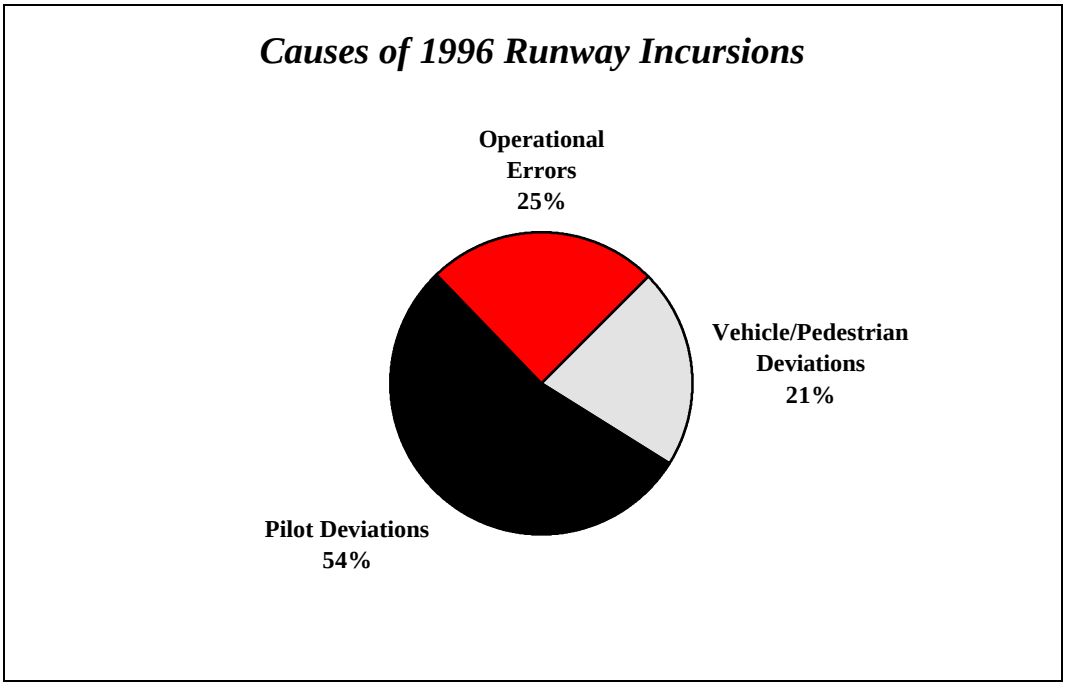
FAA runway incursion data indicate that pilot deviations were the single largest cause of runway incursions in 1995 and 1996. However, FAA has been slow to implement MITRE Corporation and FAA recommendations to reduce runway incursions caused by pilot deviations. Further, FAA's 1995 Runway Incursion Action Plan does not adequately focus on reducing pilot deviations, especially those involving general aviation aircraft.

The following chart shows that approximately 70 percent of the increase in runway incursions from 1993 to 1996 were attributed to pilot deviations.

ANALYSIS OF CHANGES IN RUNWAY INCURSIONS ATTRIBUTED TO PILOT DEVIATIONS

Pilot Deviations Compared to Total Runway Incursions	1993	1994	1995	1996	Increase from 1993 to 1996
Pilot Deviations	84	70	127	155	**71**
Total Runway Incursions	186	204	242	287	**101**
Percent of Pilot Deviations to Total	45	34	52	54	**70**

The chart shows the number of pilot deviations on the runway decreased in 1994, but increased dramatically in the following 2 years. In 1996, pilot deviations represented 54 percent of the reported runway incursions, as shown on the following chart.



Recommendations to Reduce Pilot Deviations Need to be Implemented

In 1992, FAA requested MITRE Corporation to investigate causes of pilot deviations on the runway and recommend methods of prevention. MITRE conducted a study and issued reports in 1994 and 1996. MITRE's reports concluded that many of the solutions required a low level of technology, were relatively inexpensive, and easily implemented.

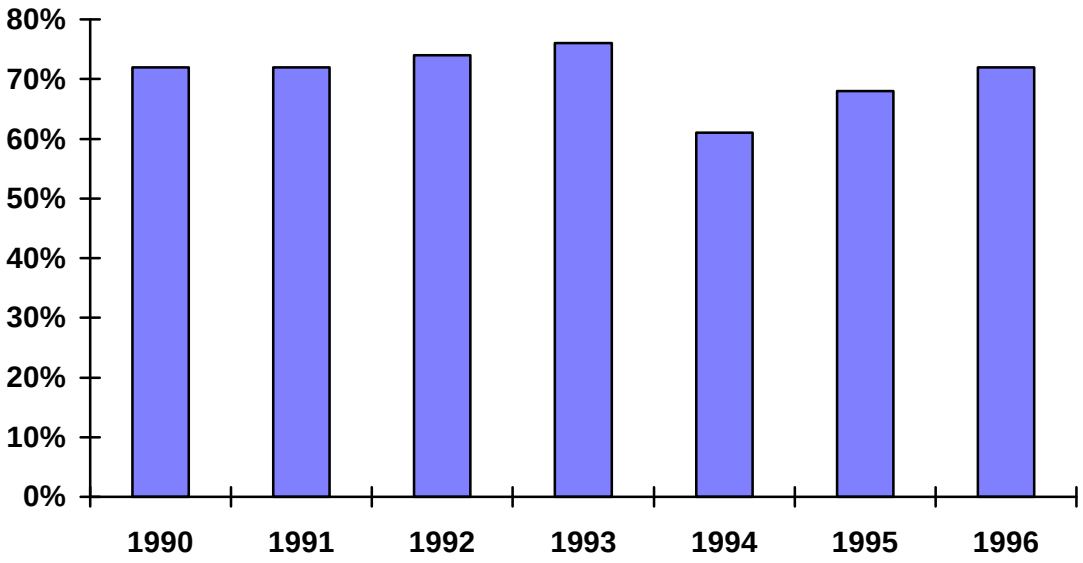
MITRE recommended 10 areas for improvement. These recommendations related to improving pilot familiarity with airports, navigation, communications, pilot memory and attention, compliance with Federal Aviation Regulations, and dissemination of safety related information. As of November 1997, FAA completed improvements in one of the 10 areas. This area concerns markings, lighting, and signs on the airport surface. Of the other nine recommendations, FAA had not agreed to one, partially completed six, and not yet started two. Exhibit D summarizes MITRE recommendations and the status of FAA actions.

NTSB supports MITRE's recommendations to reduce pilot deviations. In a September 21, 1995, letter to the FAA Administrator, the Safety Board Chairman noted MITRE's public hearing testimony that solutions proposed were not costly and were doable. The Chairman stated that "the Safety Board believes that FAA, in conjunction with industry, should develop mechanisms to implement these solutions." On November 7, 1997, FAA agreed that it needs to reexamine the MITRE recommendations and determine if they are feasible and warranted.

Pilot Deviations by General Aviation Pilots Need to be Addressed

The majority of pilot deviations on the runway are caused by general aviation pilots as shown on the following chart.

Percentage of Pilot Deviations Involving General Aviation Aircraft



While general aviation pilots are causing a majority of pilot deviations on the runway, FAA's 1995 Runway Incursion Action Plan does not include projects aimed at reducing pilot deviations by general aviation pilots. Also, we found that FAA had limited coordination with the Aircraft Owners and Pilots Association, a general aviation association, to educate general aviation pilots on preventing runway incursions.

During our audit, FAA initiated action to address pilot deviations by general aviation pilots. In June 1997, the Office of System Safety issued a report on human factors in pilot deviations causing runway incursions, including those in general aviation aircraft. In August 1997, FAA established a committee headed by the Executive Director of the Aircraft Owners and Pilots Association Air Safety Foundation to revise the Runway Incursion Action Plan. The committee has been tasked to ensure the plan adequately focuses on reducing general aviation pilot deviations on the runways.

<u>FAA's Runway Incursion Database Needs to be Improved</u>

FAA's database used to identify airports with the highest incidence of runway incursions and the causes of runway incursions contained inaccurate data. An accurate database is important because it serves as a basis for FAA to identify causal trends or problem airports and better target actions needed to reduce runway incursions.

FAA field facilities are responsible for reporting air traffic incidents, such as operational errors, pilot deviations, and vehicle/pedestrian deviations, to the Office of System Safety. This office maintains the National Airspace Information Monitoring System database, which is used to collect data on runway incursions. Incidents are occurrences which prevent air traffic facilities from providing safe, orderly, and expeditious movement of traffic. Reporting requirements are contained in FAA Order 7210.3M[5] and FAA Order 8020.11A[6]. The following chart summarizes the reporting requirements.

Reporting Requirements

Requirement	Operational Errors	Pilot Deviations	Vehicle/Pedestrian Deviations
Report Form	FAA Form 7210.2 "Preliminary Operational Error/Deviation Investigation"	FAA Form 8020.17 "Preliminary Pilot Deviation Report"	FAA Form 8020.11 "Incident Report"
Responsible Office	Air Traffic Facility	Flight Standards District Offices	Regional Airports Division
Final Report Deadline	Within 40 days	Within 90 days	No Requirement for Additional Report

Runway incursion statistics produced from the National Airspace Information Monitoring System database, which collects runway incursion data, are published in the monthly and yearly Aviation Safety Statistical Handbook and the yearly Aviation Systems Indicator Report. The Aviation Safety Statistical Handbook includes runway incursion data that identifies airports with the most incursions and compares data to the prior 12-month period. The Aviation Systems Indicators Report includes runway incursion data for comparative purposes over several years. Both reports are provided to the Runway Incursion Program Manager for use in managing the program.

Our review of FAA's runway incursion data found that (1) preliminary reports of runway incursions were not finalized by conducting an investigation as

5 FAA Order 7210.3M is entitled Facility Operation and Administration.

6 FAA Order 8020.11A is entitled Aircraft Accident and Incident, Notification, Investigation, and Reporting.

required, (2) runway incidents were not reported, and (3) runway incursions were not always recorded properly.

- Preliminary reports of runway incursions were not validated. For example, FAA field offices are required to submit final investigative reports of pilot deviations to FAA's Office of System Safety within 90 days. Our review of overdue reports as of June 18, 1997, found 14 final investigative reports on pilot deviations initially identified as runway incursions were 76 to 1,343 days (more than 3 1/2 years) past due (See exhibit E). Nine of the fourteen overdue pilot deviation reports were either in the Western Pacific or Southwest Regions. Also, 27 overdue investigative reports of pilot deviations and operational errors on the runway were prepared by FAA field personnel, but the Office of System Safety had not received copies of the reports.

- Contrary to the requirements of FAA Orders 7210.3M and 8020.11A, not all runway incidents were reported. Tower managers at five airports we visited said runway incidents were not always reported, if, in their opinion, the incidents were minor and did not result in loss of separation or collision hazard. FAA full-facility evaluations at two airports identified underreporting of incidents. Also, the FAA Administrator's Hotline Information System was informed of an alleged cover-up of an operational error at an airport. An investigation found that the operational error should have been reported.

- Runway incursions were not always recorded properly. We compared 60 runway incursions recorded in FAA's database to reports of investigations obtained at regional and field offices. Four occurrences on the runway were not recorded as runway incursions, although they met FAA's definition of a runway incursion. Conversely, four occurrences initially classified as runway incursions were later changed because of insufficient evidence. FAA's database did not reflect the reclassifications.

We also noted that FAA could improve its Runway Incursion Program by collecting and analyzing data on the types of aircraft operations involved in runway incursions. FAA has a database identifying the type of aircraft operation involved in pilot deviations, such as U.S. air carrier or general aviation. However, FAA was unable to identify types of aircraft operations involved in operational errors or vehicle/pedestrian deviations. Although FAA's form for collecting information on operational errors contains the aircraft identification number, it does not readily identify the type of aircraft operation. The form for vehicle/pedestrian deviations does not require reporting of type of aircraft operation. In our opinion, having such

information will help FAA focus their efforts on identifying the causes of and solutions to runway incursions.

Development and Installation of Major Technology Has Been Slow

FAA's runway incursion plans included projects using new technologies to respond to human errors that result in runway incursions. Implementation of two major projects, ASDE-3 and AMASS, are 4 years late.

The ASDE-3 radar detects aircraft and vehicles moving on the aircraft surface and displays positions to the air traffic controller. This radar enables tower controllers to monitor ground movement of aircraft and other vehicles during periods of low visibility and darkness. A General Accounting Office report, dated May 1995, noted that the last site implementation of the radar was delayed 4 years to November 1999 because of systems added to the project, disagreement with the contractor over contract terms, and site selection and preparation problems.

As of December 31, 1997, ASDE-3 radars have been delivered and accepted at 33 of 40 sites, and commissioned at 28 sites. Currently, the last site delivery is scheduled for June 1999.

AMASS is an automated conflict alert system that continually monitors airport surface traffic and automatically alerts controllers in all weather conditions to potential conflicts. AMASS uses data from the ASDE-3 to identify aircraft on the surface. The contract for three AMASS units was awarded in June 1996. In August 1997, the first of these systems was deployed to Detroit, where it is being tested and evaluated.

The full production contract was awarded in January 1997 for 20 systems. As of December 31, 1997, the first operational AMASS system scheduled to be deployed at San Francisco airport, has been delayed from July 1998 to December 1998. According to FAA, the 5 month delay with AMASS deployment can be attributed to the contractor's inability to meet the time schedule established in the June 1996 contract, and difficulty in finalizing the full production contract. The last system from this contract is to be deployed by August 2000. As shown on the following chart, costs had increased $14.3 million and the last installation will now be almost 4 years later than planned in 1993.

AMASS Key Milestone and Funding Information

Plan	Baseline Cost	Last Installation to be Completed
1993	$59.8 M	1996
1997	$74.1 M	2000

In addition to the need to implement systemwide solutions to reduce runway incursions, we found that regional offices did not focus their efforts on local solutions to identify and correct airport-specific problems.

Local Solutions to Runway Incursions Need to be Implemented

Runway and taxiway configurations and the type and number of aircraft operations vary from airport to airport. Consequently, solutions to runway incursion problems may be local or airport-specific. However, regional offices did not focus their efforts on their airports with the most runway incursions, which limits FAA's ability to identify and correct airport-specific problems. We found:

- Regional offices did not focus resources on causes of runway incursions.

- Regional offices were not using runway incursion data to identify airports with the most runway incursions.

Regions Need to Ensure Resources are Focused on Causes of Runway Incursions

None of the three regions visited--Eastern, Great Lakes, and Western Pacific--designated a person to serve as a regional focal point to ensure resources are directed at the causes of runway incursions at specific airports. Instead, runway incursions are investigated independently by FAA's Regional Flight Standards District Offices, Air Traffic Division, or Airports Division. Depending on the causal factor, each of these three groups report directly to a different FAA Headquarters office without any regional focus (See chart on page 13).

The effect of not having a regional focal point for runway incursions is evident from what we observed in the Eastern Region. Regional officials

stated that, because of straightlining[7], each of three groups (Flight Standards, Air Traffic, and Airports) report directly to a Headquarters office without any regional focus on runway incursions. Regional officials indicated they were not aware of the seven runway incursions shown for Newark International Airport in 1996 in the Aviation Safety Statistical Handbook. Officials from the Air Traffic, Flight Standards, and Airports Divisions had not focused on the runway incursions to determine the reasons for the occurrences and whether corrective action was needed.

At our request, Eastern Region officials met together and reviewed the five runway incursions caused by pilot deviations in 1996 at Newark International Airport. They concluded that the incursions were due to the close parallel runways and short taxiways. As a result, these officials determined the need for yellow warning lights to be placed before intersecting runways. The cost to install the lights is approximately $60,000. The Port Authority of New York and New Jersey, which operates the airport, agreed to pursue the purchase and installation of the warning lights with FAA Airport Improvement Program funds.

While none of the three regions visited had a regional focal point, the New England Region established a team to periodically analyze runway incursions, and to find solutions to correct problems. This team includes representatives from Air Traffic, Flight Standards, and the Airports Divisions. However, we were informed that the team had not established routine coordination with the Runway Incursion Program Manager.

In May 1997, FAA began using Runway Incursion Action Teams to identify (1) airport-specific problems where multiple runway incursions appear to be related and (2) work with the airport operator to implement improvements. This practice had been stopped in 1993. These evaluations are a positive step in identifying airport-specific problems and solutions.

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[7] Straightlining was established as part of a FAA reorganization in July 1988 in which regional program division managers report directly to the cognizant Associate Administrator at Headquarters, rather than to a Regional Administrator.

Regional Offices Need to Analyze Available Data to Focus Their Efforts

Regional offices did not periodically analyze runway incursion data for their airports. Also, FAA was not using NASA's data to identify airports with the most runway incidents.

FAA Headquarters provides regional offices with monthly and annual runway incursion data in the Aviation Safety Statistical Handbook. The handbook identifies airports with runway incursions and provides a comparison with the preceding 12-month period. None of the three FAA regions visited used this runway incursion data to focus on identifying causes of incursions and corrective actions to be taken at their airports. The Runway Incursion Program Manager had not requested regional offices to analyze why airports in their region had a high number of incursions or to indicate what actions were being taken to reduce the number.

Additionally, FAA was not using NASA's data to identify airports with the most runway incidents. At the same time FAA collects data on runway incursions, NASA collects data on runway transgressions to assist FAA in reaching its goal of eliminating unsafe conditions and preventing aviation accidents. NASA defines runway transgressions as "an unauthorized penetration of an active runway by an aircraft, vehicle, or person without regard to a loss of separation with another aircraft."

For example, NASA identified airports with numerous runway transgressions in 1996, but FAA was not aware of NASA's data or the differences with its runway incursion data. NASA identified Pittsburgh International Airport as having the second highest number in the nation with 11 runway transgressions. In contrast, FAA did not show any incursions for this airport. Details are provided on the following chart.

AIRPORTS IDENTIFIED BY NASA WITH THE MOST RUNWAY TRANSGRESSIONS IN 1996

AIRPORT	NASA TRANSGRESSIONS	FAA INCURSIONS	NASA RANK[8]	FAA RANK
Cleveland	19	9	1	1
Pittsburgh	11	0	2	Not Ranked
St. Louis	6	7	3	3
Louisville	6	5	3	6
Dallas/Ft. Worth	6	3	3	Not Ranked

In addition, NASA identified 129 runway transgressions caused by pilot deviations at 6 of 15 airports with the most runway transgressions during 1994

8 Airports with the same number of runway incursions have the same ranking.

through 1996. This is contrasted with FAA's report of only 24 runway incursions caused by pilot deviations for those airports in the same period. Details are shown on the following chart.

AIRPORTS IDENTIFIED BY NASA
WITH THE MOST PILOT DEVIATIONS

1994 Through 1996			
Airport	**NASA Data**	**FAA Data**	**Difference**
Cleveland	35	9	26
Pittsburgh	22	1	21
St. Louis	15	5	10
Dallas/Ft. Worth	19	2	17
Chicago (O'Hare)	21	5	16
Washington (National)	17	2	15
Total	**129**	**24**	**105**

There are reasons for differences between NASA and FAA data. One major difference is the definition of a runway transgression. Unlike an incursion, a transgression does not require another aircraft to be present. For example, an incident where an aircraft continues past the point where it was told to stop and enters an active runway, but does not interfere with another aircraft, is a runway transgression under NASA's definition. Also, NASA data are different from FAA data because reports of runway transgressions are submitted voluntarily by pilots, air traffic controllers, and others to NASA, and are not investigated. However, NASA's data could be used to supplement FAA's own data by aiding in identifying potential problem airports. While a transgression is not necessarily as significant a safety problem as an incursion, it does help to point out where future incursion problems may occur.

We discussed the need to use NASA's runway transgression data with FAA's Runway Incursion Program Manager. He agreed that the data should be used in identifying trends at specific airports. In our opinion, NASA's runway transgression data should also be used to research reasons for significant differences in the number of runway incursions reported at specific airports with FAA runway incursion data.

Recommendations

We recommend that FAA:

1. Implement specific responsibilities to oversee and coordinate initiatives and projects in the plan at the Headquarters and regional levels.

2. Coordinate local initiatives to reduce runway incursions with the Runway Incursion Program Manager to enable successful local initiatives to be shared nationwide.

3. Increase focus on projects to reduce pilot deviations and establish a joint project with the Aircraft Owners and Pilots Association to educate general aviation pilots on runway incursions.

4. Institute controls to ensure accurate runway incursion data, and collect and analyze data on the type of aircraft operations involved in operational errors and vehicle/pedestrian deviations on the runways.

5. Establish regional focal points to analyze data to ensure that resources are focused on causes of runway incursions.

6. Require regional offices to periodically analyze runway incursion data for their airports.

7. Require regional focal points to implement local action plans directed at airport-specific incursion problems.

8. Use NASA's runway transgression data to aid in identifying potential problem airports.

Management Position

In a December 11, 1997 memorandum, the Director of Air Traffic agreed to implement all eight recommendations within one year. FAA is developing a 1998 Runway Incursion Action Plan, which is scheduled to be completed in June 1998. The plan is to include specific and measurable goals, and guidance for program oversight, responsibility, and accountability for each initiative at both headquarters and regional levels.

FAA is taking action to ensure regional participation in the Runway Incursion Program. FAA is developing a new regional Runway Incursion Management Architecture. The architecture includes establishing regional teams to

coordinate local runway incursion prevention activities, periodically analyze runway incursion data for their airports, and ensure that resources are properly focused. Local runway incursion plans will be developed where needed. Regional efforts will be coordinated with the Runway Incursion Program Office and shared with other regional teams. The Runway Incursion Program Office will host semi-annual program reviews beginning February 1998, which will be attended by all regions to enhance the dissemination of information.

FAA is taking action to increase the focus on projects to reduce pilot deviations. FAA's Office of System Safety completed a human factors analysis of pilot deviation resulting in runway incursions and plans to conduct a further analysis of all types of runway incidents. The analysis, which is a cooperative effort with FAA, the Aircraft Owners and Pilots Association, and the Air Line Pilots Association, involves developing questionnaires for pilots involved in runway incidents. Further, the Aircraft Owners and Pilots Association's Safety Foundation is developing an educational program aimed at the general aviation pilot population.

Air Traffic is working with the Office of System Safety to improve runway incursion data. The new database will identify the type of aircraft involved in the incident. FAA also plans to use NASA transgression data to determine trends and causal factors.

Audit Comments

Corrective actions planned are responsive to our recommendations and should result in improvements to the Runway Incursion Program. Therefore, we consider the recommendations resolved.

Other Matters

During the audit, we identified two additional issues that warrant the attention of FAA management. The issues are the lack of performance measures for the Runway Incursion Program, and nonvisible areas on runways and taxiways.

Performance Measures

Performance measures were not developed for the runway incursion program. FAA's "Air Traffic Services Performance Plan for 1997-1999" focused on increasing system safety and set an overall performance target of reducing the operational errors in 1994 by 10 percent by the year 2000. However, specific performance measures for the Runway Incursion Program were not established.

In testimony before the Subcommittee on Aviation, Committee on Commerce, Science and Transportation, U.S. Senate on March 5, 1997, the General Accounting Office stated that "DOT and FAA will need a comprehensive strategy that includes clear goals and objectives, measurable performance criteria to assess how goals and objectives are being met, and a monitoring, evaluation, and reporting system to periodically evaluate the implementation." Without performance measures and a process to periodically assess the effectiveness of the program and related projects, FAA has no assurance that desired results are being achieved.

FAA plans to complete a revision to the Runway Incursion Action Plan in 1998. The plan should include program goals and provide a process for assessing program accomplishments. Also, FAA's goal of reducing runway incursions should be formally adopted and incorporated in the Department's Performance Plan for Fiscal Year 1999. The plan is being prepared as required by the Government Performance and Results Act of 1993.

Nonvisible Areas

FAA's 1995 Runway Incursion Action Plan did not address the vulnerability of nonvisible areas in causing runway incursions. We observed nonvisible areas at airports visited during the audit and found that concerns about nonvisible areas at airports were reported to NASA through its Aviation Safety Reporting System.

We observed surface movement areas not visible to air traffic controllers at LaGuardia Airport-New York, New York; Newark International Airport-Newark, New Jersey; Chicago O'Hare International Airport-Chicago, Illinois;

Minneapolis St.Paul International Airport-Minneapolis, Minnesota; McCarran International Airport-Las Vegas, Nevada; and Long Beach/Daugherty Field Airport-Long Beach, California. All nonvisible areas (blind spots) were on taxiways, except the blind spot at Long Beach is on a runway approach. Although FAA officials stated that these blind spots had not caused any runway incursions, the blind spots are potential hazards.

NASA's Aviation Safety Reporting System identified blind spots at airports. In response to our request, NASA provided 44 reports of such incidents between January 1988 and June 1997. For example, the November 1991 Aviation Safety Reporting System report indicated a tower controller's concern at the Palwaukee Airport in Palwaukee, Illinois. At that airport, a hangar blocked the controllers' view of the approach end of a runway. In January 1992, FAA responded that the hangar had been there more than twenty years before construction of the control tower and that the hangar would be allowed to stay temporarily. The blind spot continued until September 1997, more than five years later, when the controllers moved to a new tower. Also, 3 of the 44 incidents occurred at LaGuardia Airport, Minneapolis St. Paul International Airport, and Chicago O'Hare International Airport, where we observed nonvisible areas.

To ensure that nonvisible areas do not present a safety hazard to air travelers, FAA should ensure that the revised Runway Incursion Action Plan addresses the vulnerability of nonvisible areas at airports in causing runway incursions and surface incidents and accidents.

EXHIBIT A

STATUS OF ACTION ITEMS INCLUDED IN THE 1995 PLAN AS OF NOVEMBER 1997

Action Item	Completed	Ongoing	Dropped
Human Performance			
1. Advisory Circular on Surface Movement			X
2. Recommended Cockpit Procedures for Surface Movement		X	
3. Runway Incursion Action Teams	X		
4. Improved Airport Conspicuity		X	
5. Land and Hold Short Procedures	X		
Communications			
6. Standard Pilot Phraseology			X
7. Voice Recognition		X	
Guidance			
8. Airport Charting	X		
9. Reflective Paint Standards Research	X		
10. Update of Lighting Standards	X		
11. Automated Airfield Lighting Control			X
12. Cockpit Moving Map Standards		X	
13. Runway Status Lights	X		
Surveillance			
14. Airport Surface Detection Equipment, Model 3		X	
15. Airport Movement Area Safety System		X	
16. Low Cost Alternative Technology for Runway Incursion Prevention		X	
17. Data Link for Global Positioning System/ Automatic Dependent Surveillance on the Airport Surface		X	
Surface Traffic Management			
18. Airport Surface Traffic Automation			X
19. Operational Concepts and Requirements for 21st Century Airports	X		
20. Define Surface System Architecture	X		
21. Surface Movement Considerations for New Large Aircraft		X	
22. International Harmonization on Surface Movement Automation		X	

EXHIBIT B
(2 pages)

SUMMARY OF APPROPRIATIONS FOR RUNWAY INCURSION PROJECTS AS OF NOVEMBER 1997

Program	Status	Prior Years	FY 1997	FY 1998
Airport Surface Detection Equipment, Model 3, provides radar surveillance of aircraft and airport service vehicles at high activity airports to aid in the orderly movement of aircraft and ground vehicles on the airport surface, especially during low or no visibility conditions.	Of the 40 systems, 28 were commissioned, 5 were delivered and await commissioning, and 7 are not yet delivered.	$231.5M	$4.0M	$5.5M
Airport Movement Area Safety System is an add-on enhancement to the Airport Surface Detection Equipment, Model 3, radar to provide air traffic controllers with automated alerts and warnings of potential runway accidents.	FAA plans to install 40 systems at 34 airports, the Academy and Technical Center.	$37.4M	$15.4M	$11.6M
Low Cost Airport Surface Detection Equipment will aid in the orderly movement of aircraft and ground vehicles on the airport surface during low or no visibility conditions at low density airports not qualified to receive Airport Surface Detection Equipment, Model 3.	FAA is evaluating several types of low cost airport surface detection equipment before making a decision.	$5.0M		
Surface Inductive Loop Technology will provide a prototype system that will classify, track, and record aircraft and ground vehicle movement on taxiways and runways.	FAA installed loops at Long Beach Airport in May 1997 and completed the first phase of testing in September 1997.	$2.0M		$2.0M

EXHIBIT B

SUMMARY OF APPROPRIATIONS FOR RUNWAY INCURSION PROJECTS AS OF NOVEMBER 1997 (Continued)

Program	Status	PriorYears	FY 1997	FY 1998
Runway Status Lights System is a safety system to prevent runway incursions by providing flight crews with a visual advisory of runway status.	FAA installed a prototype system at Boston and completed proof-of-concept testing. No further testing is planned.	$6.0M		
Airport Surface Target Identification System will provide controllers with aircraft/vehicle identification and position on the airport movement area and in selected ramp and gate areas to augment existing Airport Surface Detection Equipment/Airport Movement Area Safety System. NASA's Low-Visibility and Surface Operations demonstration project is part of this system.	NASA demonstrated a prototype system at Atlanta in August 1997. Further demonstration at Dallas-Fort Worth is planned.		$4.0M	
Runway Incursion Reduction Program is a Research and Development program to provide air traffic controllers, surface vehicle operators and pilots with situational awareness, incursion monitoring and alerting information.	Ongoing Research and Development program. Facilities and Equipment funding is not anticipated until 2000.		$3.2M	$2.7M
Total		**$281.9M**	**$26.6M**	**$21.8M**

EXHIBIT C

ORGANIZATIONS CONTACTED OR VISITED

Outside Contractors
MITRE Corporation
Battelle Incorporated (support contractor to the National Aeronautics and Space Administration for the Aviation Safety Reporting System)

Other Government Agencies
National Transportation Safety Board

Aviation Organizations
Air Line Pilots Association
Flight Safety Foundation
National Air Traffic Controllers Association
Aircraft Owners and Pilots Associations
Air Transport Association of America
American Association of Airport Executives

Airports
John F. Kennedy International, New York, New York
La Guardia Airport, New York, New York
Newark International Airport, Newark, New Jersey
Chicago-O'Hare International Airport, Chicago, Illinois
Minneapolis-St. Paul International Airport, Minneapolis, Minnesota
Flying Cloud Airport, Flying Cloud, Minnesota
Logan International Airport, Boston, Massachusetts
Los Angeles International Airport, Los Angeles, California
Long Beach/Daugherty Field Airport, Long Beach, California
McCarran International Airport, Las Vegas, Nevada
William B. Hartsfield International Airport, Atlanta, Georgia
Lambert-St. Louis International Airport, St. Louis, Missouri

FAA
Headquarters
Air Traffic Service
Air Traffic Operations Program
Flight Standards Service
Airport Safety and Standards
System Safety
Aviation Policy and Plans
Communications, Navigation and Surveillance Systems
System Architecture and Program Evaluation

Regions
Eastern, Great Lakes, Western-Pacific regions and selected field offices.

EXHIBIT D

STATUS OF MITRE CORPORATION RECOMMENDATIONS AS OF NOVEMBER 1997

Areas for Improvement	Completed	FAA Disagreed	Partially Completed	Not Started
May 1994				
1. Counteracting pilot unfamiliarity with airports. [9]			X	
2. Improving airport surface navigation aids	X			
3. Enhancing Air Traffic Control (ATC)-pilot communications.			X	
4. Developing cockpit procedures and intracockpit communications				X
March 1996				
5. Standardizing use of exterior aircraft lights for increasing aircraft conspicuity.			X	
6. Improving Air Traffic Control procedures for taxiing aircraft into position and hold.			X	
7. Clarifying intent of Federal Aviation Regulations 91.129(i) taxiing across runways intersecting the taxi route.		X		
8. Responding to pilot concerns about land and-hold-short operations.			X	
9. Countering pilot fatigue and poor eating habits during duty times.			X	
10. Improving dissemination of safety-related advisory materials to pilots and controllers.				X

[9] This area includes projects to improve pilot familiarity with airport layouts, such as visual aids to help pilots operate at unfamiliar airports.

EXHIBIT E

OVERDUE FINAL INVESTIGATION REPORTS
FOR RUNWAY INCIDENTS INVOLVING PILOT DEVIATIONS
AS OF JUNE 18, 1997

REPORT NUMBER	DATE OF INCIDENT	DAYS LATE	REGION
PWPTPHX97001	1/3/97	76	Western Pacific
PEATEWR96010	12/1/96	109	Eastern
PWPTLAS96008	10/21/96	150	Western Pacific
PSWTSHV96001	8/29/96	203	Southwestern
PGLTDPA96016	8/1/96	231	Great Lakes
PGLTGFK96001	7/11/96	252	Great Lakes
PGLTFAR96001	6/12/96	281	Great Lakes
PSWTLBB96001	4/9/96	345	Southwestern
PSWTMAF96001	3/21/96	364	Southwestern
PEATPNE96001	2/4/96	410	Eastern
PWPTSFO95005	10/9/95	528	Western Pacific
PWPTRNO95010	7/26/95	603	Western Pacific
PSWTNEW94001	1/25/94	1150	Southwestern
PSWTLBB93004	7/12/93	1343	Southwestern

EXHIBIT F

AUDIT TEAM MEMBERS

The following is a list of the major contributors to this report on the Runway Incursion Program.

Jerome Persh	Program Director
Richard Kaplan	Project Manager
Frank Schutz	Auditor
Cassandra Golson	Auditor
Paul Lewis	Auditor
Nathan Custer	Auditor
Mamta Maniyar	Intern

Appendix
(4 pages)

U.S. Department
of Transportation
**Federal Aviation
Administration**

Memorandum

Subject: **INFORMATION**: Office of Inspector General (OIG) Report on the Audit of the Runway Incursion Program, Project Number 6S3017S000

Date: DEC 11 1997

From: Director of Air Traffic, AAT-1

Reply to Attn. of:

To: Deputy Assistant Inspector General for Aviation, JA-10

The recent OIG audit of the Runway Incursion Program was a positive experience that provided an objective analysis of one of the Federal Aviation Administration's (FAA) most important programs. The audit process and final recommendations will assist us in improving the program efficiency and effectiveness, and for that I thank you.

We intend to initiate immediate action to address the OIG recommendations and will complete those actions within 1 year. The specific steps we will take include the following:

1. **OIG Recommendation:** Implement specific responsibilities to oversee and coordinate initiatives and projects in the plan at the headquarters and regional levels.

We are in the process of developing the 1998 Runway Incursion Action Plan which is scheduled for completion in June 1998. The first step in this process is to get industry input into runway incursion mitigation strategies. Toward this end, we have completed a Runway Incursion Industry Roundtable where high-level representatives from the FAA and industry met to discuss this important issue.

In addition, we have formed a Research, Engineering, and Development Runway Incursion Subcommittee which has been tasked with providing recommendations that will form the basis of the 1998 action plan.

Upon completion, the action plan will have specific and measurable goals that are achievable, compatible, time bound, and will have accountability. The Runway Incursion Plan will delineate specific guidance for program oversight, responsibility, and accountability for each initiative, both at the headquarters and regional levels. Regional participation will be ensured through initiation of a new regional Runway Incursion Management Architecture (RIMA) that is currently under development.

2. OIG Recommendation: Coordinate local initiatives to reduce runway incursions with the Runway Incursion Program Manager to enable successful local initiatives to be shared nationwide.

Resolution of this recommendation will be accomplished through the new RIMA referenced above. One aspect of the RIMA is what we call the Regional Surface Error Prevention Team. This team will be charged with, among other duties, coordinating local activities that draw attention to surface error prevention activities. All regional efforts will be coordinated with the Runway Incursion Program Office, and shared with other regional teams. The dissemination of information will be further enhanced through semiannual program reviews attended by all regions, and hosted by the Runway Incursion Program Office. The first of these meetings will occur in February 1998.

3. OIG Recommendation: Increase focus on projects to reduce pilot deviations and establish a joint project with the Aircraft Owners and Pilots Association (AOPA) to educate general aviation pilots on runway incursions.

The Runway Incursion Program Office will work closely with the Flight Standards Service and the Office of Aviation Safety on this important issue. We have completed a human factors analysis of pilot deviation runway incursions and will follow this effort up with an analysis of all airspace users and all types of runway incidents. This project will

include, but not be limited to, a cooperative effort with AOPA, including the Safety Foundation and the Air Line Pilots Association, to develop callback questionnaires for pilots involved in runway incidents. The callback will gather data from 75 surface pilot deviations involving general aviation aircraft and 50 involving air carrier pilots. The Safety Foundation is presently gathering material to put together an intense informational and educational program aimed at the general aviation pilot population.

4. OIG Recommendation: Institute controls to ensure accurate runway incursion data, and collect and analyze data on the type of aircraft involved in operational errors and vehicle/pedestrian deviations on the runways.

We are working closely with the Office of Aviation Safety to legitimize the runway incursion data. We will establish a Memorandum of Understanding (MOU) with them, identifying the process to be used in accomplishing this recommendation. In conjunction with this task, the need to include the type of aircraft involved in any surface incident will be part of the new data base. We also started work this year on the development of new Vehicle/Pedestrian Deviation preliminary and final investigation forms. These forms will provide the data we need to track these types of incidents and identify causal factors.

5. OIG Recommendation: Establish regional focus points to analyze data to ensure that resources are focused on causes of runway incursions.

See response to recommendations 2 and 3. RIMA's will be required to analyze data from facilities within their perspective regions to ensure resources are properly focused.

6. OIG Recommendation: Require regional offices to periodically analyze runway incursion data for their airports.

See response to recommendations 2, 3, and 5.

7. **OIG Recommendation:** Require regional focal points to implement local action plans directed at airport specific incursion problems.

Another feature of the RIMA is the requirement to develop local runway incursion plans where needed and to provide follow-up action.

8. **OIG Recommendation:** Use the National Aeronautics and Space Administration's (NASA) runway transgression data to aid in identifying potential problem airports.

We are in the process of reviewing the FAA and NASA MOU to determine the Aviation Safety Reporting System (ASRS) reporting requirements to the FAA. If necessary, we will coordinate an amendment to the MOU to require the forwarding of surface error data to the Runway Incursion Program Office. This data will be used to determine trends and causal factors.

As you can see, we are committed to addressing your concerns and will keep you informed of our progress.

Ronald E. Morgan

cc: ABA-130