

REVIEW OF FAA'S CALL TO ACTION PLAN FOR RUNWAY SAFETY

Federal Aviation Administration

Report Number: AV-2010-071

Date Issued: July 21, 2010



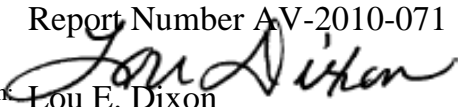
U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Memorandum

Subject: **ACTION:** FAA's Call to Action Plan for
Runway Safety
Federal Aviation Administration
Report Number AV-2010-071

Date: July 21, 2010

From: 
Lou E. Dixon
Principal Assistant Inspector General
for Auditing and Evaluation

Reply to
Attn. of: JA-1

To: Federal Aviation Administrator

Runway safety is a top priority for all users of the National Airspace System, and runway incursions (potential collisions on airport runways) remain among the most critical safety concerns. In fiscal year (FY) 2008, the total number of runway incursions reached a 5-year high of 1,009. While they subsequently decreased to 951 in FY 2009, this still represents a 30-percent increase since 2004. Reducing the risk of runway incursions is a key performance goal for the Federal Aviation Administration (FAA) and requires heightened attention at all levels of the Agency as well as proactive efforts by airlines and airport operators.

In August 2007, FAA, airline, and airport officials created a Call to Action Plan (the Plan) for improving runway safety after several close calls at some of the Nation's busiest airports. The Plan identified a series of short-, mid-, and long-term initiatives to reduce runway incursions. FAA also established a Runway Safety Council—a joint government/industry body to develop a systemic approach for improving runway safety.

We conducted this audit at the request of Senator John Rockefeller and Senator Kay Bailey Hutchison of the Senate Commerce, Science, and Transportation Committee. Specifically, they asked that our office conduct a comprehensive review of the current state of aviation safety, including a focus on runway safety issues. Our audit objective was to evaluate the effectiveness of actions taken as a result of FAA's Call to Action Plan for improving runway safety.

We conducted the audit at eight airports and two airlines from January 2009 through April 2010 in accordance with government auditing standards prescribed

by the Comptroller General of the United States. Exhibit A details our audit scope and methodology. Exhibit B lists locations visited or activities contacted.

RESULTS IN BRIEF

Since the Plan's inception in 2007, the most serious runway incursions decreased from a total of 24 to 12 in FY 2009 (50 percent). While the Plan clearly had an impact on the reduction in serious incidents, there are a number of other factors that may have contributed to the decrease as well. First, airport operations have decreased by 14 percent since FY 2007; with fewer aircraft and vehicles on runways and taxiways, there is less potential for runway incursions to occur. Second, important safety improvements were implemented at several major airports before the Plan was established. Finally, FAA's runway incursion severity rating process can be inconsistent, subjective, and potentially susceptible to bias, making the accuracy of year-to-year comparisons of serious incidents questionable.

Nevertheless, airport, airline, and air traffic control officials we spoke with credited the Plan for creating an environment of heightened attention about runway safety among all users—a substantial accomplishment. To date, FAA and industry stakeholders have implemented a series of short-term initiatives identified in the Plan. These include upgrading airport surface markings, completing safety reviews at high-risk airports, and improving pilot training and cockpit procedures during taxi operations. However, to achieve its overall goal of reducing runway incursions by 10 percent by FY 2013, FAA must follow through to set milestones for the Plan's mid- and long-term initiatives as well. These include expediting key technologies to alert pilots when it is unsafe to enter a runway and ways to notify pilots of airport changes (such as temporarily closed runways or inoperable navigational aids). Ultimately, the success of the Plan depends on sustaining the current momentum to complete all Plan initiatives. In the past, we found that FAA's efforts diminished as it initially met its overall goal for reducing runway incursions only to later see a rebound in the total number of incidents.¹

We are making a series of recommendations to ensure the initiatives of FAA's Call to Action Plan are effectively implemented.

¹ OIG Report Number AV-2007-050, "Progress Has Been Made in Reducing Runway Incursions, but Recent Incidents Underscore the Need for Further Proactive Efforts," May 24, 2007. OIG reports are available on our website: www.oig.dot.gov.

BACKGROUND

FAA defines a runway incursion as any incident involving an unauthorized aircraft, vehicle, or person on a runway.² Runway incursions are classified into three categories: (1) operational errors (when the actions of a controller cause an incident); (2) pilot deviations (when the actions of a pilot cause an incident); and (3) vehicle/pedestrian deviations (when the actions of a vehicle operator or pedestrian cause an incident).

Runway incursions are also rated by severity (Categories A through D).³ Category A runway incursions (the most serious) represent incidents in which a collision was barely avoided. For example, on September 19, 2008, in Allentown, Pennsylvania, a Cessna 172 landed at Lehigh Valley International Airport and was unable to exit at the first taxiway as instructed. Meanwhile, the controller cleared a Mesa Airlines regional jet to take off from the same runway. During take-off, the Mesa crew heard the Cessna pilot tell the controller that he had missed his exit, saw the Cessna in front of them on the runway, and aborted their take off. However, the crew had to swerve the aircraft to miss the Cessna, and a collision was avoided by an estimated 10 feet (see figure 1).

Figure 1. Path of Category A Runway Incursion at LeHigh Valley International Airport



Source: NTSB

Category D runway incursions (the least serious) are those incidents where there is no chance of a collision. These include incidents where an aircraft, vehicle, or person entered or crossed a runway without authorization but did not conflict with an aircraft.

² This new definition corresponds with the International Civil Aviation Organization's (ICAO) definition and was adopted by the FAA at the start of FY 2008.

³ Guidance for program administration, including rating the severity of runway incursions, is contained in FAA Order 7050.1, Runway Safety Program.

FAA has two goals for runway safety: (1) reduce Category A and B runway incursions to a rate of no more than 0.45 per million operations by the end of FY 2010—and maintain or improve that rate through FY 2013—and (2) reduce total runway incursions by 10 percent from the FY 2008 baseline by 2013. FAA’s Air Traffic Organization’s (ATO) Runway Safety Office is responsible for overseeing the Agency-wide runway safety program. However, three FAA lines of business are actually responsible for implementing specific runway safety actions: ATO (Terminal), Aviation Safety (Flight Standards), and Airports Division.

After several close calls involving commercial aircraft in 2007, the FAA Administrator met with aviation community leaders from airlines, airports, air traffic control and pilot unions, aerospace manufacturers, and FAA managers to identify ways to improve runway safety. The group developed a five-point, short-term Call to Action Plan that was further expanded in 2008. It also identified mid- and long-term actions. Table 1 details the actions outlined in the Plan.

Table 1. Summary of Call to Action Initiatives

Short-Term Actions
1. Within 60 days, conduct safety reviews at the airports where wrong runway departures and runway incursions are the greatest concern.
2. Within 60 days, disseminate information and training across the entire aviation industry.
3. Within 60 days, accelerate required airport signage and markings improvements at the top 75 airports, ahead of FAA’s June 2008 deadline.
4. Within 60 days, review cockpit procedures and air traffic control (ATC) clearance procedures.
5. Implement a voluntary self-reporting system for all air traffic controllers and technicians.
Mid-Term Actions
1. Accelerate the modernization of the Notices to Airmen (NOTAM) system to digitally communicate key information to pilots.
2. Accelerate runway status lights used to alert pilots of unsafe conditions.
3. Implement National Transportation Safety Board and Commercial Aviation Safety Team recommendations relating to air traffic clearances/phraseology and cross checking runway alignment.
Long-Term Actions
1. Deploy moving map cockpit displays that provide the capability to see other traffic and include conflict alerting.
2. Expedite the development of off-the-shelf, low-cost ground surveillance for smaller airports.
3. Modernize the aeronautical information dissemination program to permit distribution of graphic information, such as airfield construction diagrams.

Source: FAA’s Call to Action Plan

FACTORS OTHER THAN THOSE INCLUDED IN THE CALL TO ACTION PLAN HAVE LIKELY CONTRIBUTED TO THE DECREASE IN SERIOUS RUNWAY INCURSIONS

Since the Plan's inception in FY 2007, the most serious runway incursions have decreased by 50 percent (from 24 to 12). While the Plan clearly had an impact on the reduction in serious incidents, there are a number of other factors that may have contributed to the decrease as well. We identified three such contributing factors. First, since FY 2007, airport operations have decreased by 14 percent, resulting in fewer aircraft and vehicles using runways and taxiways, which diminishes the potential for runway incursions to occur.

Second, many safety improvements were made before or apart from the Plan. For example, at larger, more complex airports, such as Atlanta Hartsfield and Chicago O'Hare, controllers were providing more detailed taxi instructions to pilots than what was required by FAA orders before the Plan was established. At least 24 of the 75 commercial airports (32 percent) installed enhanced surface markings prior to the Plan's inception. Additionally, officials at three airports we visited credited the use of end-around taxiways to the significant drop in their runway incursions—an initiative that was never included in the Plan.⁴

Third, FAA's current process for rating the severity of runway incursions is highly subjective and has potential for bias; making comparisons to prior years less reliable. Runway incursion severity is currently determined by a panel of three subject matter experts (one each from the Airports, the Air Traffic, and Aviation Safety Organizations) who review and rate each incident.

In 2007, FAA's Air Traffic Safety Oversight Office (AOV) reported that the severity definitions contained in FAA's Runway Safety Program guidance (FAA Order 7050.1) do not provide sufficient guidance to differentiate between classifications. For example, the guidance includes broad definitions such as "narrowly avoided" for classifying a Category A incident, "a significant potential" for classifying a Category B incident, and "ample time" for a Category C incident. AOV recommended that the ATO take corrective actions to standardize the process for all runway incursions severity classifications. We identified similar concerns. For example, we evaluated a judgmental sample of serious runway incursions that occurred between FY 2007 and FY 2009 and found several runway incursions that appeared similar but had different ratings. As shown in table 2, aircraft involved in both of these runway incursions missed each other by 50 feet, but the one in FY 2007 was rated as a Category B incident while the FY 2009 incident was rated as a Category C.

⁴ An end-around taxiway is a taxiway that is constructed around the perimeter of an airfield, thus reducing the need for pilots to use taxiways that cross an active runway.

Table 2. Similar Runway Incursions Caused by an Aircraft Crossing in Front of a Departure

Category B Runway Incursion, FY 2007	Category C Runway Incursion, FY 2009
At Los Angeles International Airport (LAX), the ground controller cleared a Boeing 737 pilot who had switched radio frequencies without authorization to cross the runway—while the local controller had cleared an Airbus 320 pilot for takeoff on the same runway. The Boeing 737 pilot questioned the clearance, but not until he crossed the hold-short line. The estimated horizontal proximity between the 2 aircraft was 50 feet.	At Phoenix Deer Valley Airport (DVT), a Piper PA28A pilot took the crossing clearance for another aircraft and taxied across the runway hold-short line without authorization, conflicting with a departing aircraft. The closest horizontal separation reported between the 2 aircraft was 50 feet.

Source: OIG analysis of FAA’s Runway Incursion Database

Further, there is little or no documentation on how the panel of subject matter experts determined the severity rating. FAA’s Runway Safety Program guidance does not explicitly require documentation to be maintained justifying the basis for the rating. Consequently, there is no audit trail that would allow a third party to replicate the panel’s decision-making logic in rating an incident’s severity. For example, if the three panel members cannot come to a unanimous agreement on a rating, the Runway Safety Office Director makes the final determination, yet no official records are maintained to document the Director’s justification for the rating.

We also found that when additional information is received, the database narrative used in the rating determination is not updated. For example, we questioned the severity rating of a Category C incident because the narrative indicated that the pilot took “evasive action” and missed the vehicle by “50 feet.” Based on similar incidents, it appeared to us that this incident should have been rated as a Category A or B runway incursion. Through discussions with panel members, we determined that the panel had subsequently obtained the pilot’s statement, which indicated that he saw the vehicle one mile out, was aware of the vehicle’s location, and was able to safely maneuver to land. However, the database used to document the incident’s details and the panel’s decision was not updated to include this new information. This highlights the importance of properly documenting the basis for its severity rating so that third-party reviews can understand the process used to assign the rating.

The Runway Safety Program Office is modifying its guidance in response to AOV’s and our concerns. Also, FAA is working to implement an automated process to rate the severity of runway incursions that will reduce subjectivity and human bias in the rating process. However, the model still has limitations that restrict its use as a complete and independent replacement for an assessment panel.

For example, in an independent validation report, FAA contract evaluators noted that not all runway incursion scenarios (or factors within a scenario) can be included in the automated model. FAA is working to improve the reliability of the model; meanwhile, it must rely on the assessment panel to rate the severity of runway incursions.

FAA AND INDUSTRY MADE PROGRESS ON SHORT-TERM ACTIONS TO IMPROVE RUNWAY SAFETY

Since the Plan's inception in 2007, airport, airline, and air traffic officials have taken notable steps to implement the Plan's short-term actions. These include enhancing surface markings at airports, improving airport vehicle driver training programs, and conducting safety reviews at high-risk airports to identify corrective actions. FAA also established a Runway Safety Council—a joint government/industry body to develop a systemic approach for improving runway safety.

Airports Implemented Initiatives To Enhance Surface Markings and Employee Training

All 75 large, commercial airports enhanced their airport markings and signage (ahead of the FAA-mandated date of June 2008) to better alert pilots when they approach a runway entrance (see figure 2 for example). In March 2008, FAA expanded this effort by requiring smaller airports (those with less than 1.5 million passenger enplanements) to install enhanced taxiway centerline markings. Depending on the number of enplanements at their locations, airports must complete this action by either December 31, 2009, or December 31, 2010.

In response to the Plan, airports were also encouraged to require recurrent training for anyone who operates a vehicle on taxiways or runways. As a result, all 560 certificated airports now require initial and recurrent training for airport employees (e.g., vehicle drivers), and 555 of the 560 certificated airports require it for non-airport employees (e.g., airline or construction workers) as well.

Figure 2. Enhanced Surface Markings at Dallas/Fort Worth International Airport



Source: OIG

Finally, local airport, air traffic, and pilot representatives conducted safety reviews at 42 airports and identified airport-specific actions needed to address safety risks, as required by the Plan. For example, as shown in figure 3, at San Francisco International Airport, a surface painted taxiway directional sign was installed to prevent serious runway incursions that occurred when pilots on this taxiway (i.e., Taxiway C) did not turn onto Taxiway E as instructed and instead entered an active runway located on the other side of Taxiway E. Air traffic also adopted a procedure that required all aircraft that are originating from that side of the airport (mostly general aviation) but departing from the other side of the airport to use the end-around taxiway, thus avoiding any runway crossings. As a result of these efforts, surface/runway incidents in the area of the intersection of Taxiways C and E have been eliminated.

Figure 3. Surface Painted Taxiway Directional Sign at San Francisco International Airport



Source: OIG

Airlines Made Progress on Pilot Training Initiatives

As called for in the Plan, commercial air carriers committed to providing more realistic pilot training for taxiing aircraft from the gate to the runway. For example, the two airlines we visited require pilots to practice complex taxi procedures during simulator training. Commercial air carriers also reviewed their cockpit procedures and eliminated distractions during taxi operations. For example, one airline we visited eliminated six of the seven items in the taxi-out checklist to reduce distractions. However, these actions were voluntary, not mandated; therefore, FAA must continually oversee airlines' procedures and training to ensure they maintain these safety improvements. To its credit, FAA Flight Standards personnel indicated that they are developing an inspection checklist for inspectors to use during reviews of airline runway safety programs.

The ATO Is Implementing Air Traffic Control Safety Initiatives

The Plan required the ATO to improve clearance procedures and implement a voluntary safety reporting system for air traffic controllers. FAA performed an extensive review of air traffic control procedures, resulting in six new changes to improve runway safety. Two procedures have been implemented: (1) controllers must provide pilots with explicit taxi instructions to the assigned runway and (2) an aircraft must be clear of all intermediate runways before receiving a departure clearance. The remaining four procedures involve eliminating implied

runway crossings, requiring specific clearance for explicit runway-to-runway crossings, setting new limitations on multiple landings clearances, and adopting international phraseology to clear departing aircraft on the runway.⁵ These changes are scheduled for implementation in 2010.

FAA also began implementing its Air Traffic Safety Action Program (ATSAP) to provide controllers with an anonymous means to report potential safety concerns. ATSAP has been implemented at air traffic facilities in the Central and Western Service areas. Air traffic facilities in the Eastern Service Area are scheduled for completion in FY 2010. Early indications are that ATSAP has had a positive impact in identifying and mitigating safety concerns. For example:

- At one location, an airline was using limited flaps to save fuel, which led to pilots missing the high-speed taxiway exit. The pilots would then mistakenly turn at the next intersection, which was an active runway. As a result of ATSAP and pilot reports, the airline was able to educate crews on what to do if they miss the high-speed taxiway.
- At another location, an ATSAP report identified a visibility problem in the tower where controllers could not see some areas of the runway. This report resulted in the removal or relocation of equipment, which allowed controllers to see aircraft on both sides of the airfield.

FAA Established a Runway Safety Council To Improve Runway Safety

FAA established the Runway Safety Council on October 29, 2008, as a joint government and industry body to develop a systemic approach to improving runway safety. A key focus of the Council is the Root Cause Analysis Team (RCAT), which was established to analyze serious runway incursions and make safety recommendations to the Council. As of December 2009, however, the RCAT has completed reviews for only two runway incursions and has not made any recommendations to the Council. While the program has had a slow start, FAA officials expect future reviews to take less time.

⁵ *Implied runway crossings* allow pilots to cross all runways en route to the assigned departure runway. With these eliminated, air traffic control will instruct pilots to hold short of every runway en route to the departure runway and issue separate crossing clearances for each runway. *Explicit runway-to-runway crossings* will require pilots to obtain a specific clearance to cross each runway. *Multiple landings clearances* will limit the distance from the airfield before controllers can issue landing clearances to pilots. The adoption of *international phraseology* to clear departing aircraft onto the runway but not for take-off will require the use of “line-up and wait” phraseology, which is used by controllers in other countries. U.S. controllers currently use the phraseology “taxi into position and hold.”

FAA'S CALL TO ACTION PLAN LACKS SOME KEY SAFETY INITIATIVES AND A LONG-TERM STRATEGY

We found that FAA's Call to Action Plan lacked critical components that could significantly reduce runway incursions. In particular, we identified two initiatives that should have been included in the Plan given their known safety benefits at airports: (1) adding "hotspot" information (potentially hazardous intersections) on FAA-published airport diagrams to warn general aviation pilots of areas where runway incursions most often occur and (2) implementing end-around taxiways at airports nationally—a critical safety enhancement because it reduces the need for pilots to cross runways. In addition, FAA has not taken steps to fully assess important longer-term safety initiatives included in the Plan (such as expediting technologies that provide alerts directly to pilots of impending runway incursions) or set possible completion dates. Completing and improving Plan initiatives is important to fully address safety improvements agreed upon by all aviation stakeholders during the 2007 Call to Action.

FAA Did Not Include Two Key Initiatives in the Plan

FAA has made little progress in adding hotspot information to its own airport diagrams published by the National Aeronautical Charting Office (NACO).⁶ In contrast, commercially available Jeppesen airport diagrams have included this information on their diagrams for years. Information on hotspots is especially important for general aviation pilots who are responsible for 70 percent of the runway incursions caused by pilots and are the primary users of the NACO airport diagrams. In fact, the organization that represents general aviation, the Aircraft Owners and Pilots Association (AOPA), indicated that it has been trying to get FAA to add hotspots on these diagrams for over 2 years.

However, as of September 24, 2009, only 35 of the 560 (6 percent) certificated airports have hotspots identified on their NACO airport diagrams. Further, FAA does not have a strategy to prioritize updates to NACO diagrams at high-risk airports. Only 8 of the 42 (19 percent) high-risk airports identified during the Call to Action had diagrams with known hotspots included. For example, both Fort Lauderdale Executive and DeKalb Peachtree general aviation airports have historically had a high number of runway incursions, but their airport diagrams have not been updated to include hotspots.

In addition, FAA does not have a national plan to identify and install end-around taxiways at airports where feasible. End-around taxiways (taxiways around the perimeter of an airfield) are one of the most effective means to prevent runway

⁶ Both the FAA and Jeppesen diagrams generally contain the same information but may be presented differently. Jeppesen charts are obtained from the company with a subscription cost, and FAA charts can be obtained from its online website at no cost. Hardcopies of FAA charts can also be obtained at a minimal cost.

- expediting off-the-shelf, low-cost ground surveillance systems at smaller airports.
- modernizing the aeronautical information dissemination program to permit the distribution of graphic information, such as airfield construction diagrams.

These initiatives are important for reducing the risk of future runway accidents. For example, both runway status lights and moving map display technologies include conflict alert capabilities that provide direct warnings to pilots of impending incursions—a longstanding NTSB recommendation because pilots provide the first line of defense in preventing runway accidents. At the time of our review, however, FAA had not yet established a plan for expediting the implementation of these initiatives.

FAA'S NATIONAL PLAN FOR RUNWAY SAFETY IS INCOMPLETE AND LACKS ACCOUNTABILITY

We found that FAA's National Plan for Runway Safety (the National Plan), which is FAA's program for improving runway safety on an ongoing basis, did not include key initiatives and lacked accountability mechanisms to ensure runway safety remains a priority. The Call to Action Plan was a one-time event designed to reinvigorate runway safety efforts due to close calls that occurred in 2007. To ensure runway safety is addressed on a continuous basis, FAA's Runway Safety Office is responsible for developing a National Plan, which identifies activities it plans to take to improve runway safety. The National Plan is developed in coordination with other FAA lines of business and the aviation community and is separate from the Call to Action Plan.

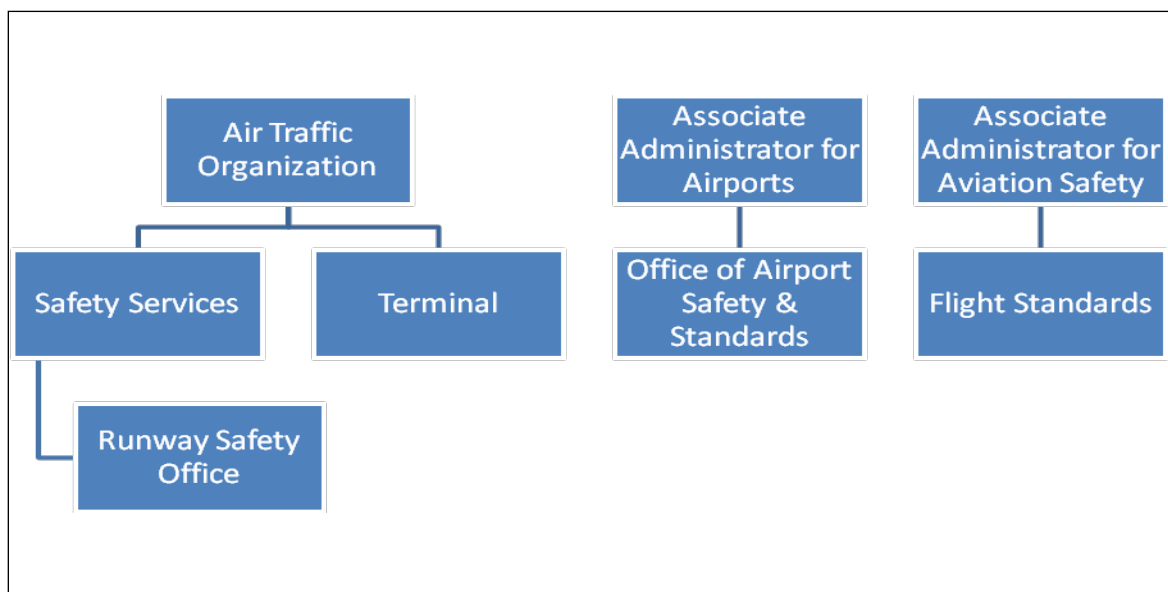
In May 2007, we reported that FAA no longer prepared the National Plan and that greater authority and accountability at the national level was needed to ensure runway safety remains a top priority for all FAA lines of business. The National Plan is a critical mechanism for setting FAA's current and long-term strategies and initiatives for improving runway safety and holding responsible organizations accountable for the timely implementation of runway safety initiatives. In response to our report, FAA reestablished its National Plan in December 2008—6 years after its last plan was issued in July 2002. However, we found that the December 2008 National Plan was incomplete. Specifically, it did not include three of the six mid- and long-term initiatives identified during the Call to Action Plan nor did it include initiatives for hotspots or end-around taxiways.

The National Plan also did not consistently include milestones, identify responsible organizations and resources, or include metrics for measuring the effectiveness of actions taken as required by FAA Order 7050.1 (Runway Safety

Program). For example, the National Plan included 25 initiatives identified as next steps following the Call to Action Plan; however, 24 lacked milestones and all 25 lacked required resources and metrics for measuring their effectiveness. The National Plan also included five initiatives to improve pilot training and instruction, yet it did not identify milestones, resources, or metrics. Without clear responsibilities and set milestones, FAA will not have a mechanism to ensure planned actions are completed in a timely manner.

Since 1997, we have been reporting on the need to improve program accountability within FAA's Runway Safety Program. While the Runway Safety Office is responsible for the overall management of FAA's runway safety program, it is the responsibility of other FAA offices to ensure individual initiatives are implemented. As such, runway safety is a shared responsibility among the various FAA lines of business. For example, it is the responsibility of the ATO to ensure changes to air traffic procedures are implemented timely, the responsibility of Flight Standards to ensure pilots are properly trained, and the responsibility of the Airports Division to ensure runway markings are installed properly. However, as shown in figure 5, the current alignment of the Runway Safety Office within the ATO limits the ability of the Director to hold other FAA organizations accountable for implementing initiatives since those organizations are outside his authority.

Figure 5. Key FAA Lines of Business Responsible for Runway Safety



Source: OIG

In 2001, we recommended that FAA consider realigning the Runway Safety Office under the Deputy Administrator.⁸ In its response, FAA stated that it would evaluate the recommended realignment as part of the ATO development. However, the position was never aligned under the Deputy Administrator. By aligning the Runway Safety Office outside of FAA's operational lines of business, FAA would be better able to hold individual lines of business accountable and ensure that runway safety remains a priority. This is vital to allow continued improvement in runway safety including follow through on incomplete initiatives.

CONCLUSION

Reducing the risk of runway incursions is a critical part of FAA's primary mission to oversee and enhance the margin of safety of the National Airspace System. While the number of serious runway incursions has declined since 2007, it is important that FAA complete its efforts to prevent runway accidents. In the past, we found that FAA's actions to improve runway safety diminished as it met its overall goals for reducing runway incursions. Sustained commitment along with adequate resources and executive level attention will be crucial to achieving long-term results in this important safety area.

RECOMMENDATIONS

To ensure that all actions identified by FAA and industry stakeholders during the 2007 Call to Action are addressed, we recommend that FAA:

1. Establish milestones for the implementation of mid- and long-term initiatives identified during the Call to Action Plan and include these initiatives in FAA's National Runway Safety Plan.

In addition to completing the initiatives identified in the Call to Action Plan, we recommend that FAA:

2. Require that the basis for runway incursions severity ratings be clearly documented in a consistent manner to provide an audit trail for third-party review and replication of the rating process.
3. Establish milestones and responsibilities for identifying runway "hotspots" on FAA-published airport diagrams and include this initiative in FAA's National Plan for Runway Safety.

⁸ OIG Report Number AV-2001-066, "Despite Significant Management Focus, Further Actions Are Needed To Reduce Runway Incursions," June 26, 2009.

4. Develop a plan and establish timelines for constructing end-around taxiways at airports (where such actions are feasible) and include this initiative in FAA's National Plan for Runway Safety.
5. Revise FAA's National Plan for Runway Safety to include the responsible FAA office, specific milestones, and metrics for each initiative.
6. Realign the Runway Safety Office outside of FAA's operational lines of business, such as directly reporting to the Deputy Administrator.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

We provided FAA with a draft copy of this report on May 3, 2010, for comment and received FAA's response on June 18, 2010. In its response, FAA emphasized the positive impact it believes the Call to Action Plan has had on the reduction in serious incidents and stressed that it has built controls into its severity rating process. In addressing our specific recommendations, FAA fully concurred with recommendations 1, 2, 3, and 5 and provided reasonable timeframes for completing the planned actions. FAA partially concurred with recommendations 4 and 6 but proposed acceptable alternative courses of action with reasonable timeframes. With regard to recommendation 4, FAA agreed that end-around taxiways do reduce runway crossings. FAA proposed, however, to first review (and potentially update) the criteria for evaluating the justification and feasibility of more end-around taxiways since they can also add certain risks if installed with insufficient clearances from active runways. With regard to recommendation 6, FAA stated that while it believes the Runway Safety Office has demonstrated effectiveness, the Agency is committed to continually improving its safety initiatives and will periodically review organizational structures and processes.

ACTIONS REQUIRED

We consider all six recommendations resolved as addressed but open pending completion of the planned actions. We appreciate the courtesies and cooperation of FAA representatives during this audit. If you have any questions concerning this report, please contact me at (202) 366-1427 or Daniel Raville, Program Director, at (202) 366-1405.

#

cc: FAA Deputy Administrator
Martin Gertel, M-100
Anthony Williams, ABU-100

EXHIBIT A. SCOPE AND METHODOLOGY

We conducted this performance audit from January 2009 through April 2010 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. The following scope and methodology were used in conducting this review.

The audit included site visits to eight airports and two airlines, and fieldwork at FAA Headquarters in Washington, DC. We also interviewed pilot, controller, and general aviation industry associations and representatives from the National Transportation Safety Board (see exhibit B for list of all entities contacted or visited).

To evaluate the impact and status of Call to Action initiatives, we interviewed responsible FAA Headquarters personnel, industry personnel, and field personnel. We also reviewed related documentation (including local action plans) and physically verified the accomplishment of infrastructure improvements. We obtained runway incursion data from FAA's national runway incursion database and compared incursion data from FY 2007 to FY 2009 to determine the impact the Plan had on runway incursions. We used FY 2007 as our base year to determine the impact of the Call to Action because this was the year in which the Plan was initiated.

To evaluate other factors impacting runway incursions, we obtained the number airport operations from FAA's Air Traffic Activity System and compared the number of operations from FY 2007 to FY 2009. We also reviewed specific actions taken at the airports and airlines we visited, and interviewed air traffic, airline, and airport personnel. Finally, to evaluate FAA's process for rating the severity of runway incursions, we: (a) reviewed AOV's 2007 audit report on the severity rating process and related correspondence, (b) reviewed FAA guidance contained in FAA Order 7050.1, (c) observed the process used by the panel to rate runway incursions, (d) selected a sample of runway incursions and reviewed related documentation, and (e) reviewed the validation report for the automated system to be used to rate incursions (Runway Incursion Severity Classification model).

We judgmentally selected the eight air traffic control towers/airports we visited. Six were selected because they were among the 42 high risk airports identified as part of the Call to Action surface reviews. Two additional facilities (Addison and

Fort Worth Meacham) were selected because they had implemented the Air Traffic Safety Action Program (ATSAP) and also had a history of runway incursions.

Finally, we followed up on the status of FAA actions taken in response to the six recommendations in our May 2007 runway incursion report.

To determine the accuracy and completeness of the national runway incursion database, we judgmentally sampled runway incursion investigation reports and compared these reports to the runway incursions listed on the national runway incursion database.

EXHIBIT B. ENTITIES VISITED OR CONTACTED

FAA Headquarters in Washington, DC

- ATO – Safety Services (including the Runway Safety Office and Regional Runway Safety Program Managers)
- ATO – Terminal Services
- Aviation Safety – Air Traffic Safety Oversight Service
- Aviation Safety – Flight Standards Service
- Office of Airports

FAA Air Traffic Control Towers and Airport Operators

- Addison, Dallas, TX
- Atlanta Hartsfield-Jackson International, Atlanta, GA
- Dallas/Fort Worth International, Fort Worth, TX
- DeKalb Peachtree, Atlanta, GA
- Fort Lauderdale Executive, Fort Lauderdale, FL
- Fort Lauderdale Hollywood International, Fort Lauderdale, FL
- Fort Worth Meacham International, Fort Worth, TX
- San Francisco International, San Francisco, CA

Airlines, Industry Associations, and other Federal Agencies

- American Airlines
- Delta Airlines
- Aircraft Owners and Pilots Association
- Air Line Pilots Association
- Airports Council International
- Air Transport Association
- National Air Traffic Controllers Association
- National Transportation Safety Board

EXHIBIT C. MAJOR CONTRIBUTORS TO THIS REPORT

<u>Name</u>	<u>Title</u>
Dan Raville	Program Director
Mary E. (Liz) Hanson	Project Manager
Mark Gonzales	Senior Analyst
Karen B. Thompson	Senior Analyst
Kevin Montgomery	Analyst
Andrea Nossaman	Writer-Editor

APPENDIX. AGENCY COMMENTS




Federal Aviation Administration

Memorandum

Date: June 18, 2010

To: Lou Dixon, Principal Assistant Inspector General for Auditing and Evaluation

From: Ramesh K. Punwani, Assistant Administrator for Financial Services/CFO 

Prepared by: Anthony Williams, x79000

Subject: OIG Draft Report: FAA's Call to Action Plan for Runway Safety Federal Aviation Administration

Runway safety is one of the Federal Aviation Administration's (FAA) top priorities. An aggressive and effective FAA runway safety program has significantly reduced the number of serious runway incursions. While we are energized by the progress the FAA has made working together with airports and operators, we also recognize the need for and are committed to sustaining those achievements and continuing to improve runway safety.

The Call to Action has significantly increased safety at our nation's airports. The Call to Action Plan was jointly developed by the FAA, industry, and labor - and each committed to accomplishing the actions identified and to support a continuing effort to reduce runway incursions. Even though the Office Inspector General's (OIG) draft report states, "most airport, airline, and air traffic control officials we spoke with all credited the Plan for creating an environment of heightened attention about runway safety among all users- a substantial accomplishment" the draft report gives very little credit to the Call to Action for the dramatic improvement in runway safety. We believe the data show otherwise.

Data Demonstrate Call to Action Plan Effectiveness

Available data demonstrate the significant positive effect the Plan has had on incursions as compared to the other factors cited in the OIG draft report. For example, the report points out the decrease in traffic and indicates this decrease may be contributing to an overall reduction in serious runway incursions. Traffic counts alone do not tell a convincing story. During fiscal years (FY) 2004 through 2006 the number of serious runway incursions increased despite the fact that traffic counts were decreasing. In FY's 2007 and 2008, the number of serious incursions increased slightly despite a 5 percent reduction in the number of operations. A 14 percent reduction in FY

2009 traffic does not explain a 50 percent decrease in the number of serious incursions during the same time period.

The OIG report also lacks recognition of the causality between surface safety improvements and actions taken pursuant to the Plan. Specifically, almost no credit for safety improvements is given to the focused Runway Safety Action Team (RSAT) visits to higher-risk airports. But when comparing events at the first 20 airports to receive the focused surface safety reviews that resulted from the Call to Action, the overall number of serious incursions at those airports was reduced by 50 percent. Airport management at Dallas Fort Worth directly attributes much of the improved safety to the Call to Action safety analysis conducted and the airport adopting that format for continued quarterly safety meetings. The Call to Action risk items and approach were incorporated into the process used today on all RSATs. Almost all of these RSATs identify specific short-term measures to improve signage and markings, identify hot spots and other measures needed to improve pilot and driver situational awareness. The OIG report should more clearly recognize the successful contribution of RSATs to safety improvements. The significant reduction in serious incursions is system-wide and is, at least in part, an outcome of the call to action plan.

FAA Accurately Assessing Incursion Severity

We disagree with the OIG draft report's characterization of the incursion severity rating process. A close examination of FY 2009 data by Runway Safety analysts demonstrates exceptional consistency among the results of the expert panels who rate the severity of an incursion. While we recognize that there is some subjectivity involved in assessing surface events, the data show that FAA has adequately controlled for that subjectivity and provided consistently accurate characterizations of these occurrences. We ask that OIG revise its characterization in the draft report, particularly in the Results in Brief section. That said, we are always open to constructive suggestions to improve our processes, and are committing to several improvements, as noted below.

Documentation maintained on the assessment process indicates the events cited in Table 2 of the report were assigned different rankings because the Los Angeles International Airport (LAX) incident involved two air carrier aircraft, both of which were still on the ground, when the departure missed the aircraft crossing the hold line by 37 feet. Documentation on the event at Phoenix Deer Valley Airport (DVT) indicated the departure took no unusual or evasive actions and was airborne at 150 feet or greater altitude when it passed the intersection where the other aircraft had crossed the hold line - thus a significantly lower risk of any possible collision. This type of distinction is the result of subject matter experts collecting and reviewing all available information when making severity determinations.

FAA Making Progress Implementing New Approaches to Reduce Incursions

FAA is working with new approaches and technologies to further reduce incursions and improve runway safety. Examples include Runway Status Lights (RWSL), low cost ground surveillance systems, and end around taxiways (EAT). The draft report's discussion of three of these could better recognize the progress that has been achieved to date.

The report faults the FAA for not accelerating the installation of RWSL, but does not give credit for the significant progress already achieved. An evaluation RWSL system was installed at LAX in a remarkably short time through a cooperative FAA/LAX effort. This system is in operation

Appendix. Agency Comments

today and has already proven very effective. Another system is almost operational at Boston-Logan Airport. The FAA has awarded a national contract for installing RWSL at 23 major airports.

Similarly, the draft report faults the FAA for not setting milestones for low cost ground surveillance systems (LCGS). While we agree that the test systems (at 5 airports) are just now being installed, the contracts awarded for these test systems include a delivery clause for the procurement of additional systems. This will significantly accelerate subsequent procurement and installation.

Finally, we share the OIG view that controlled end around taxiways (EAT) are a safety benefit because they reduce runway crossings. The FAA does have guidance for EAT installation, in AC 150/5300-13 change 4, and does encourage EAT use to improve efficiency and capacity at locations that can meet the standard. However, we are also aware of concerns that EATs installed with insufficient clearances from active runways can also add risk to our aviation system.

Runway safety remains one of the FAA's top priorities. FAA has achieved tremendous progress in reducing the number of serious runway incursions and remains committed to further improvement.

Response to Recommendations:

OIG Recommendation 1. Establish milestones for the implementation of mid- and long-term initiatives identified during the Call to Action Plan and include these initiatives in FAA's National Runway Safety Plan.

FAA Response: Concur. The Runway Safety Call to Action Mid/Long-Term Initiatives Action Plan Working Group convened on January 25, 2010 and April 8, 2010. The Working Group includes representatives from the Air Traffic Organization (ATO), Office of Airports, and Aviation Safety. The Working Group representatives provided schedules, milestones, and status updates for the actions required to implement the mid- and long-term initiatives. An Action Plan has been drafted and is in the process of being finalized. Pending review and approval by the Working Group members, the Action Plan will be finalized and published by September 30, 2010.

It should be noted that many actions relating to mid- and long-term initiatives were well underway even before the effort to formalize the action plan. For example, Direct Notice to Airmen (NOTAM) entry by airport operators will enable FAA to improve the accuracy and timeliness of airport NOTAM information. Last year the FAA completed a safety analysis that will allow all airports with 24-hour air traffic control towers to enter NOTAMs into the automated NOTAM system. This direct entry system is scheduled to be demonstrated over the next six months at up to twelve airports. These airports include: Atlantic City (ACY), Memphis (MEM), Baltimore-Washington Thurgood Marshall (BWI), Norfolk, VA (ORF), Reagan National (DCA), Chicago O'Hare (ORD), Chicago Midway (MDW), Richmond (RIC), Denver (DEN), Washington Dulles (IAD), Fort Wayne (FWA), and Fairbanks (FAI).

Additional mid- and long term initiatives are also progressing. The Airport Traffic Situational Awareness - Surface with Indications and Alerts (ATSA SURF-IA) program is developing traffic display and alerting on electronic flight bags (EFB). This system will provide pilots and vehicle drivers situational awareness through a GPS-like airport moving map display as well as direct

Appendix. Agency Comments

warnings to the cockpit or vehicle through indications of conflicting traffic or, in the case of potential collisions, alerts to allow the potential situation to be mitigated. Flight testing for requirement definition has already been performed at the Philadelphia International Airport and the Seattle-Tacoma International Airport, and the system performed satisfactorily. The SPR (Safety, Performance, and Requirements) document development is scheduled to be completed in September 2010.

OIG Recommendation 2. Require that the basis for runway incursions severity ratings be clearly documented in a consistent manner to provide an audit trail for third-party review and replication of the rating process.

FAA Response: Concur. Although this was not specifically enumerated in the Call to Action Plan, the responsibility for the severity assessment process was shifted within the ATO Office of Safety to the Runway Safety Office on October 1, 2009. The documentation and rationale used during the assessment process is being retained to facilitate internal reviews and external audits. An updated FAA Order 7050.1, Runway Safety Program, describing the severity rating process has been coordinated and is being forwarded for signature. The order should be signed by September 30, 2010. A Standard Operating Procedure for severity classification is scheduled to be completed by November 30, 2010, and will define additional requirements to document team proceedings described in FAA Order 7050.1. The Runway Safety Office is committed to continuous improvement and the updated Runway Safety order also establishes a quarterly management review of severity classifications. The results of these reviews will be used to identify any remaining rating inconsistency or subjectivity and to implement methods to continue to improve the consistency of rankings.

OIG Recommendation 3. Establish milestones and responsibilities for identifying runway "hotspots" on FAA-published airport diagrams and include this initiative in FAA's National Plan for Runway Safety.

FAA Response: Concur. Currently 90 NACO airport diagrams have hotspots indicated. Each publication of NACO charts adds more hotspot data in the flight information publications. It is anticipated that all current hotspots will be depicted on NACO charts within the next six publication cycles (approximately April 2011). Airport diagrams will be regularly updated as additional hotspots are identified or a hotspot risk mitigated. Airports mentioned as not having hotspots depicted on the airport diagram (Atlanta Dekalb-Peachtree (PDK) and Fort Lauderdale Executive (FXE)) do have hotspots depicted on current publications. Supplemental information, such as pictures of these confusing areas with additional descriptions, has been published as kneeboard-sized charts (a common size and format for aeronautical information used by pilots) and tri-fold brochures. Much of this information is available on the Runway Safety Website.

Runway Safety fully agrees that adding hotspots to NACO diagrams where appropriate should be and is a high priority for the Office of Runway Safety. In addition, the Runway Safety Office has worked with the Aircraft Owners and Pilots Association (AOPA) to provide this information on their Airport Directory website.

OIG Recommendation 4. Develop a plan and establish timelines for constructing end-around taxiways at airports (where such actions are feasible) and include this initiative in FAA's National Plan for Runway Safety.

Appendix. Agency Comments

FAA Response: Partially concur. Although EATs do reduce runway crossings, the FAA is concerned that they can add also add risk by crossing in front of aircraft taking off or landing. Accordingly, we believe it is premature to just proceed with developing a plan for installing more EATs. Instead, we propose to review (and potentially update) the criteria for evaluating the justification and feasibility of end-around taxiways at commercial service airports. This review will be complete by September 30, 2011.

OIG Recommendation 5. Revise FAA's National Plan for Runway Safety to include the responsible FAA office, specific milestones, and metrics for each initiative.

FAA Response: Concur. The next publication of the National Plan occurs in FY 2011 (scheduled for December 2010). We are currently updating the plan and will incorporate the responsible office for each identifiable initiative. In addition, we will add milestones and metrics to each initiative (where applicable).

OIG Recommendation 6. Realign the Runway Safety Office outside of FAA's operational lines of business, such as directly reporting to the Deputy Administrator.

FAA Response: Partially concur. As exemplified by FAA-wide actions taken as a result of the call to action, the reduction in the total number of runway incursions and the dramatic reduction in serious runway incursions; the office has clearly demonstrated its effectiveness. However, we are committed to continually improving our safety initiatives and will periodically review organizational structures and processes to that end.