Federal Aviation Administration

National Runway Safety Plan

2015 – 2017

http://www.faa.gov/go/nrsp/

Contents

Foreword

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Today's aerospace enterprise is among the most technically complex systems ever devised. The demands on the National Airspace System plus the impact of evolving technology, rising traffic volumes, and the implementation of the Next Generation Air Transportation System create an environment where assumptions must be continually tested and validated using robust feedback loops. Recognizing the scope of this increasing complexity, the Administrator recently reinforced the importance of building upon the ability of the Federal Aviation Administration Safety Management System to find the issues, use multiple data streams to analyze the issues, and devise comprehensive corrective actions that are measured and monitored.

The 2015-2017 National Runway Safety Plan (referred to herein as the "Plan") directly supports the Administrator's Strategic Priorities, including the initiatives to make aviation safer and smarter in the nation's airports by moving to risk-based decision making; enabling the safe and efficient integration of the Next Generation Air Transportation System; and demonstrating global leadership in improving air traffic safety and efficiency through data-driven solutions that shape international standards.

Evaluating runway safety performance, given the increased volume of air and surface traffic and the accommodation of new aerospace vehicles, requires moving beyond just tracking and determining responsibility for runway incursions and other incidents. This Plan outlines the transition from a reactive, event-based safety system to a proactive, risk-based system that incorporates the safety policies, culture, risk management, promotional, and analytical tools available in the Safety Management System. Utilizing these principles, the agency is transitioning to a data-driven, risk-based approach to monitoring and maintaining the safety parameters of the runway and airport surface environment.

THE AGENCY IS TRANSITIONING TO A
DATA-DRIVEN, RISK-BASED APPROACH

The increasing capability of the Safety Management System needs to be matched by the development of risk-based operational metrics that support the identification of interacting hazards among system components and can classify the interdependencies created by these interactions. Surface safety metrics that identify the underlying linear, non-linear, static, and dynamic integrated risk characteristics will enable the development of organizational risk registers and allow the agency to effectively model future states.

The 2015-2017 National Runway Safety Plan is a living document that incorporates these objectives and outlines the Federal Aviation Administration's medium-term runway safety strategic vision for the 2015 – 2017 timeframe.

Joseph Teixeira
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1.0 Executive Summary

The Federal Aviation Administration's (FAA) top priority is maintaining safety in the National Airspace System (NAS). Safety in the NAS hinges on maintaining integrity, security, and efficiency where multiple safety responsibilities converge – the nation's airports. The goal for runway safety is to improve safety by decreasing the number and severity of runway incursions (RIs) and serious surface incidents.

Since the publication of the 2012 National Runway Safety Plan, the aerospace industry has grown more technically complex, undergone a multiplicity of organizational changes, and experienced a rapid surge of multiple types of safety data. To address these challenges, the 2015-2017 National Runway Safety Plan outlines the FAA's strategy to adapt its runway safety efforts through enhanced collection and integrated analysis of data, development of new safety metrics, and leveraged organizational capabilities. The Plan describes the FAA's strategic activities, programs, and objectives associated with achieving the agency's runway safety goals and targets, including the evolution of a corporate approach to managing safety on the nation's runways.

The Plan employs a portfolio-based approach to runway safety that incorporates risk-based decision making, one of the FAA Administrator's Priority Initiatives **(Appendix H).** The Plan focuses on the development of the interagency strategic processes to transition from event-based safety to risk-based safety using multiple data sources and stakeholder subject matter experts to assess current risk, predict future risk, and establish relevant metrics that measure the reduction in risk.

Developing a corporate approach to surface safety that embraces the concept of using multiple sources of data from operators, airlines, and regulators to identify an expanding number of upstream precursors to events is one objective of the National Runway Safety Plan. This is a fundamental shift in aviation safety thinking and will require informed education as well as communication with internal, external, and political constituents.

The Plan aligns with the FAA's Priorities, the Administrator's Priority Initiatives, and the goals identified in the congressionally mandated 2012 Strategic Runway Safety Plan **(Appendix B).** The Plan incorporates FAA Fiscal Year 2014 (FY2014) Business Plans by reference, and contains input from several FAA and aerospace industry stakeholders. The Plan is a living document that outlines the FAA's medium-term runway safety strategic vision for the 2015 – 2017 timeframe.

2.0 Introduction

Aviation is essential to the sustained health and growth of the United States economy. In 2012, aviation accounted for 5.4% gross domestic product, contributed $1.5 trillion in total economic activity, and supported 11.8 million jobs. Aviation manufacturing also continues to be the nation's top net export.[1]

Entire industries, both domestic and international, rely upon the sustained, safe operation of the NAS. Since the beginning of the aviation transportation age, the FAA's mission has been to provide the safest, most efficient aerospace system in the world. As the air navigation service provider for United States, the FAA's Air Traffic Organization (ATO) is responsible for providing safe and efficient air navigation services across 17 percent of the world's airspace. The ATO Safety and Technical Training office supports the NAS operation through robust safety assurance and quality management systems that provide visibility into one of the most technically complex and highly effective systems in existence. The Office of Airports (ARP), through its Office of Safety and Standards (AAS), provides standards for airport design and construction, as well as regulatory oversight of commercial service airports.

Since 2000, the FAA has achieved quantifiable success in improving runway safety. Incorporation of multiple layers of technology; changes in airport and taxiway layouts; improvements to runway lights, signs, and markings; changes to regulatory guidance, training for pilots, controllers and

[1] The Economic Impact of Civil Aviation on the U.S. Economy; U.S. Department of Transportation, Federal Aviation Administration, June 2014.

vehicular drivers; improvements to the runway environment; establishment of non-punitive safety reporting systems; and use of the exponential rise in analytical data have all contributed to a 90 percent reduction of serious runway incursions during the last decade and prevented untold damage and injuries from runway excursions.

Building on this success, the FAA is adopting a corporate, risk-based approach that incorporates the rapidly expanding availability of FAA data, analytical capabilities, multi-media communications and training applications within a robust Safety Management System (SMS). The Vice President of Safety and Technical Training oversees the maintenance of the ATO's SMS. As a group within ATO Safety and Technical Training, the Runway Safety Group (RSG) is the focal point for runway safety initiatives in the NAS. Evolving technology, increasing complexity, and the implementation of the Next Generation Air Transportation System's (NextGen) gate-to-gate concept of operation make it imperative to develop risk-based decisions using processes housed inside the SMS framework. The four components of the SMS—Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion—work in harmony to enable the FAA to find, analyze, mitigate, and monitor risk throughout the NAS, including the nation's airport surfaces. The RSG is leveraging the emerging capabilities of the SMS processes to develop a multi-layered approach to identify and address risk on the nation's runways.[2]

In addition to reducing the rate and severity of surface events, another key success metric for the FAA is the measure of how many causal and contributory issues have been identified and corrected. These metrics are tracked on the ATO's safety dashboard.

[2] Runway Incursion Database; ATO Safety and Technical Training, Accessed July 15, 2014

3.0 Scope, Purpose, and Goal

The Plan provides strategic guidance to the aviation community about current and planned FAA runway safety activities, organizational alignment, stakeholder engagement, and success metrics. The Plan is a single, overall national strategy to ensure that organizations with runway safety responsibilities understand these responsibilities and work together. The Plan was developed with input from FAA lines of business as well as aviation associations, airspace system users, and other governmental agencies.

The Plan aligns with the FAA Administrator's Strategic Priority to *Make Aviation Safer and Smarter*,[3] and incorporates by reference current year Business Plan Measures, Initiatives, Objectives, and Targets for the relevant Lines of Business (LOB). The resources and timelines dedicated to achieving runway safety specific milestones are identified in FY2014 Business Plans **(Appendix A)** and are noted within the sections of this document.

3.1 Scope

The FAA is accountable for the safety of the NAS, including airport surface areas. Effective November 7, 2013, the Runway Safety Program Order (FAA Order 7050.1B) established policy, assigned responsibility, and delegated authority for the FAA's Runway Safety Program to the Vice President of ATO Safety and Technical Training.[4] As a group within ATO Safety and Technical Training, the RSG serves as the focal point and manages the FAA's Runway Safety Program.

[3] http://www.faa.gov/about/plans_reports/media/FAA_Strategic_Initiatives_Summary.pdf

[4] FAA Order 7050.1B, November 7, 2013 assigns roles and responsibilities to the Runway Safety Group, formerly known as the Office of Runway Safety. The Runway Safety Group (AJI-14) is in the AJI Safety Directorate (AJI-1) of the Air Traffic Organization.

The Plan refers to the following FAA Lines of Business:

Office of Airports (ARP)

Within the Office of Airports, Airport Safety and Standards (AAS) regulate commercial airports certificated under Title 14 Code of Federal Regulations (CFR) Part 139 by providing safety oversight of airport operations and through periodic certification and safety inspections. In addition, the Office of Airports develops airport standards for the operation, maintenance, and layout (design) for all airports in the National Plan of Integrated Airport Systems.

Office of Aviation Safety (AVS)

The Office of Aviation Safety has three primary organizations:

- **Flight Standards Service (AFS)** develops and enforces certification standards for pilots, mechanics, and others in safety-related positions and oversight of domestic and international air carriers that operate within the NAS.
- **Office of Accident Investigation and Prevention (AVP)**
- **Air Traffic Safety Oversight Service (AOV)** audits ATO compliance with runway safety standards and the ATO SMS.

Air Traffic Organization (ATO)

The ATO has three pertinent service units:

- **Safety and Technical Training** is responsible for integrating safety standards into the provision of air traffic services, leading organizational efforts to manage surface safety risk, assuring quality standards, and developing policy and processes for improving operational safety within the ATO including the area of runway safety. In addition, the Office develops relevant event-based training on information extracted from the FAA's SMS safety systems.
- **Air Traffic Services** provides safe and secure air traffic management across the NAS through FAA airport towers, FAA contract towers, Terminal Radar Approach Control facilities and En Route Centers.
- **Technical Operations Services** analyzes, tracks, and recommends improvements to NAS facilities and services that impact safe surface movement, including communications, navigation, and surveillance systems.

FAA Order 7050.1B expanded the scope of the Runway Safety Program to include the prevention of runway excursions. This Plan describes the RSG's strategies to develop a systemized data collection process and classification scheme in cooperation with appropriate FAA LOB and industry groups to identify the causal and contributory factors of excursions from the runway and other airport movement areas.

Multiple forums and organizations ensure effective oversight and coordination of the Runway Safety Program. At the strategic level these include: the National Transportation Safety Board; Department of Transportation, Office of Inspector General; U.S. Government Accountability Office; and the FAA's Air Traffic Safety Oversight Service. The Commercial Aviation Safety Team, General Aviation Joint Steering Committee, the Runway Safety Council, and the Surface Safety Initiatives Team contribute valuable tactical analysis and make recommendations for coordinated improvement to runway safety efforts.

Accountability is assured through compliance with the delegated roles and responsibilities in FAA Order 7050.1B. The FAA's compliance with FAA Order 7050.1B is currently tracked through action items stored within the Runway Safety Tracking System (RSTS) and Local and Regional Runway Safety Action Plans. Future compliance assurance will include integrated reporting developed by ATO Safety and Technical Training's Quality Assurance Group, national Corrective Action Requests and Corrective Action Plans.

In accordance with the vision bounded by the Plan, Regional Runway Safety Program Managers, in coordination with other FAA LOBs, will develop annual Regional Runway Safety Plans that identify and prioritize activities within their respective FAA Regions, including the identification of Regional Focus Airports[5].

[5] See National Focus Airport Program, Section 4.2, 2014 National Runway Safety Plan

3.2 Purpose

The purpose of the Plan is to provide an overall strategy and ensure that all organizations work together in a coordinated manner towards achieving a safer runway environment in accordance with the requirements of the FAA Runway Safety Program Order (7050.1B).

3.3 Goal

This goal is consistent with the Administrator's Priority Initiative to Make Aviation Safer and Smarter, as defined in the 2012 Strategic Runway Safety Plan, and FAA Order 7050.1B.

Past plans have outlined a resource intensive, consensus-driven approach to reduce the number of serious runway events. This approach met the goal to improve runway safety and achieved the metrics identified in the FAA's Business Plans. This has led to improvements to runway safety guidance, education, training, airport infrastructure, risk identification and mitigation strategies, and development of surface safety technologies.

As operation of the NAS and the airport surface grows more complex and generates new and different types of data, the FAA is transitioning to a data-driven, risk-centric, consensus approach to identifying and resolving significant surface safety issues. The agency is building upon its past success and will continue to maintain and improve its record of overall runway safety during this transitional period.

The Goal:
2015 – 2017 Plan

To leverage:

- NEW PROCESSES
- SOURCES OF SAFETY DATA
- INTEGRATED SAFETY ANALYSIS

to continue to reduce serious runway safety events, and identify, mitigate, and monitor the conditions and factors that combine to create risk before serious events occur.

4.0

2015-2017 National Runway Safety Plan Objectives

To support the Plan, the FAA is expanding the range of the Runway Safety Program to include the following objectives:

Integration of runway safety efforts consistent with the maturation of the FAA's Safety Management System	4.1
Establishment of a National Focus Airports Program	4.2
Development of runway safety metrics which identify and rate the effectiveness of the agency's runway safety risk assessment efforts	4.3
Redefinition of FAA organizational responsibility for runway safety	4.4
Further develop internal and external communication and stakeholder engagement strategies to include collaborative training, local leadership and the expanded use of mobile technology and social media	4.5

Each objective has action items and completion target dates which will work in concert to achieve the plan goal.

4.1 Runway Safety and Safety Management System (SMS)

Goal 7 of the 2012 Strategic Runway Safety Plan identified the following requirement: "Continue to develop the components of the FAA's operational SMS to identify and manage those hazards and risks which transcend individual regulated entities and overlap multiple sectors."[6]

An SMS is a formalized and proactive approach to system safety that uses an integrated collection of principles, policies, processes, procedures, and programs used to find, analyze, and address risk in the NAS. Pursuant to FAA Order 8000.369A,[7] the FAA is implementing an FAA SMS in accordance with the International Civil Aviation Organization (ICAO) SMS and State Safety Program.

In accordance with direction of Order 7050.1B, the ATO Vice President of Safety and Technical Training must periodically evaluate the effectiveness of the FAA's runway safety efforts. To align with the development efforts of the Administrator's strategic priorities, the Runway Safety Program Order will be rewritten to assimilate runway safety activities into the FAA's Safety Management System (Action Item 4.1.A).

The integration of ATO and ARP runway safety data in a surface safety mobile application will allow access by the RSG, Airports Safety Inspectors and other FAA safety inspectors to critical runway safety information (Action Item 4.1.B).

4.1.1 FAA SMS

FAA SMS Order 8000.369A advances "further safety management by moving towards a more process oriented safety system approach with an emphasis on risk management and safety assurance." FAA Safety Risk Management Order 8040.4A formalizes the use and communication of Safety Risk Management across the FAA. Together, these two Orders define current National Policy for the development of the FAA SMS and outline the architecture of the current SMS and align with the Administrator's Strategic Priorities. Near term FAA SMS development efforts are focused in three areas:

[6] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, Nov, 2012. Ch.3, Pg. 9 (Goal 7)

[7] FAA Order 8000.369A_Safety Management System Effective Date 5/08/13.

2015

OBJECTIVE 4.1

Align Runway Safety activity within the FAA's Safety Management System

Target Date: Dec 31 2015

2016

Action Item 4.1.A

Revise FAA Runway Safety Order 7050.1B to reflect the corporate management approach and integration with FAA SMS principals.

Action Item 4.1.B

Integrate ATO and Airports runway safety data.

2017

- *Improved standardization including the development of a common taxonomy; data access including an agency-wide hazard tracking system; and modeling integration involving a risk-based decision making application*
- *Enhanced decision making including an LOB level significant safety issue identification process*
- *Evolution of the safety oversight model to include an administrator level FAA compliance process*

These enhancements to the FAA SMS will ensure that cross organizational issues regarding safety on the nation's airports are addressed within the relevant FAA LOB and at the appropriate levels within the FAA.

Today, the FAA is leveraging the hazard identification, risk assessment, and safety assurance processes within the ATO and Office of Airports SMS programs to further promote runway safety. The RSG has contributed to the functions of these SMS programs through data collection, analysis of risk information resulting in safety policy changes, Runway Safety Action Team activities, stakeholder communications and engagement, and development of feedback loops within primary stakeholder groups.

4.1.2 ATO SMS

The ATO SMS Manual Version 4.0 defines safety as, "the state in which the risk of harm to persons or property damage is acceptable."[8] A chief function of the SMS is to collect and analyze relevant data that identifies the factors that constitute acceptable risk. This directly impacts efforts to develop and implement complex, integrated NextGen systems and improve the safety and efficiency of air travel in the United States for the coming decades.

4.1.3 Airports SMS

Like the ATO SMS program, Airports SMS is comprised of the same four components which create a systemic approach to managing the safety of airport operations: safety policy, safety risk management, safety assurance and safety promotion. However, Airports SMS encompasses two distinct programs. The *internal* program requires the agency to incorporate SMS in to the review and approval process for airport planning and operations activities such as construction project planning, modifying airport standards, developing airport layout plans, airport design, and developing advisory circulars. The *external* SMS program, currently in rulemaking, proposes requiring certain airports to implement SMS.

[8] SMS Manual Version 4.0, Chapter 1. FAA Air Traffic Organization. April 29, 2014.

The four components of the SMS combine to create a systemic approach to managing and ensuring safety:

1. Safety Policy

The documented organizational policy that defines management's commitment, responsibility, and accountability for safety. Safety Policy identifies and assigns responsibilities to key safety personnel.

2. Safety Promotion

The communication and distribution of information to improve the safety culture, and the development and implementation of programs and/or processes that support the integration and continuous improvement of the SMS within the ATO.

3. Safety Risk Management

A process within the SMS composed of describing the system, identifying the hazards, and analyzing, assessing, and controlling risk. Safety Risk Management includes processes to define strategies for monitoring the safety risk of the NAS. Safety Risk Management complements Safety Assurance.

4. Safety Assurance

A set of processes within the SMS that verify that the organization meets or exceeds its safety performance objectives. The processes function systematically to determine the effectiveness of safety risk controls through the collection, analysis, and assessment of information.

The Office of Airports will provide regulatory oversight of the airports' implementation of SMS after a final SMS rule is published.

Internally, the FAA is required to complete a formal safety risk management process for airport development proposals such as construction, planning, and modification to airport design standards to identify those proposals that have the potential to introduce hazards into the NAS, and conduct Safety Risk Management (SRM) for those proposals. The SRM brings internal and external stakeholders together to identify potential hazards and risks associated with the proposed action and develop mitigation measures for those risks to an acceptable level. The SRM requirements have been in place at large hub airports since 2011. The FAA plans to expand Safety Risk Management applicability to medium hub airports in 2015, and small hub airports in 2016. Airport safety data collection and analysis, when integrated with data from ATO and AVS sources, will enhance the safety of the NAS and increase the safety and efficiency of airport operations.

Since 2011, the FAA has required that development proposals at large hub airports undergo Safety Risk Management reviews. This requirement replaces a similar role provided by ATO that will potentially expand to smaller commercial service airports. Safety Risk Management produces large amounts of data that can be used to enhance awareness and predictability for future airport activities when integrated with data from ATO and Flight Standards Service.

Under Title 14, Code of Federal Regulations Part 139 – Certification of Airports, the FAA is pursuing rulemaking to require certain certificated airports to implement SMS. A Supplemental Notice of Proposed Rule Making is scheduled for publication by first quarter of FY2015.

2015

OBJECTIVE 4.2

Establish the National Focus Airports Program

Target Date: Dec 31 2015

2016

Action Item 4.2.A

Define the process, criteria, data sources and methodology for the development of the National Focus Airports Program.

Action Item 4.2.B

Populate and identify Corrective Action Plans for each National Focus Airport.

2017

4.2 National Focus Airports Program

The FAA is developing a National Focus Airport Program to focus efforts and coordinate resources to address safety hazards at specific airports, similar to the ATO's Top 5 program[9]. The RSG is assessing and—where necessary—improving policy, guidance, engagement, and training strategies to address risk at the focus airports. The National Focus Airports Program will be established utilizing risk-based SMS processes that leverage the combined collection and analysis of relevant surface safety data, identifies causal and contributory factors, communicates safety issues, implements Corrective Action Plans and monitors feedback loops **(Objective 4.2).**

Figure 4-1. Types of Surface Events

Operational Incident

A Surface Event attributed to ATC action or inaction.

Pilot Deviation

Action of a pilot that violates any Federal Aviation Regulation. Example: a pilot crosses a runway without a clearance while en route to an airport gate.

Vehicle/Pedestrian Deviation

Any entry or movement on the movement area or safety area by a vehicle (including aircraft operated by a non-pilot or an aircraft being towed) or pedestrian that has not been authorized by ATC.

[9] The ATO's Top 5 program annually identifies the most critical air traffic safety hazards, utilizing data from the Risk Analysis Process and the agency's voluntary safety reporting systems. 2012 ATO Safety Report.

4.3 Runway Safety Metrics

As a performance-based organization, the FAA strives to improve safety performance by identifying and addressing safety risks. Current performance metrics for runway safety include severity, number, and rate of runway incursions. In support of the national runway safety goal, the FAA will continue to report its success in reducing runway incursions through the use of these metrics while implementing new tools and the capability to baseline runway activity, and develop relevant risk-based metrics for multiple surface safety issues.

RUNWAY INCURSIONS

Currently, runway safety is measured by monitoring three metrics:

- *Frequency of runway incursions*
- *Severity of runway incursions*
- *Types of runway incursions*

Runway incursions are classified by type, typically falling into one of three categories: Operational Incidents, Pilot Deviations, and Vehicle/Pedestrian Deviations. Type classification allows mitigation strategies to be developed by the appropriate FAA organization. Figure 4-1 lists the types of surface events.

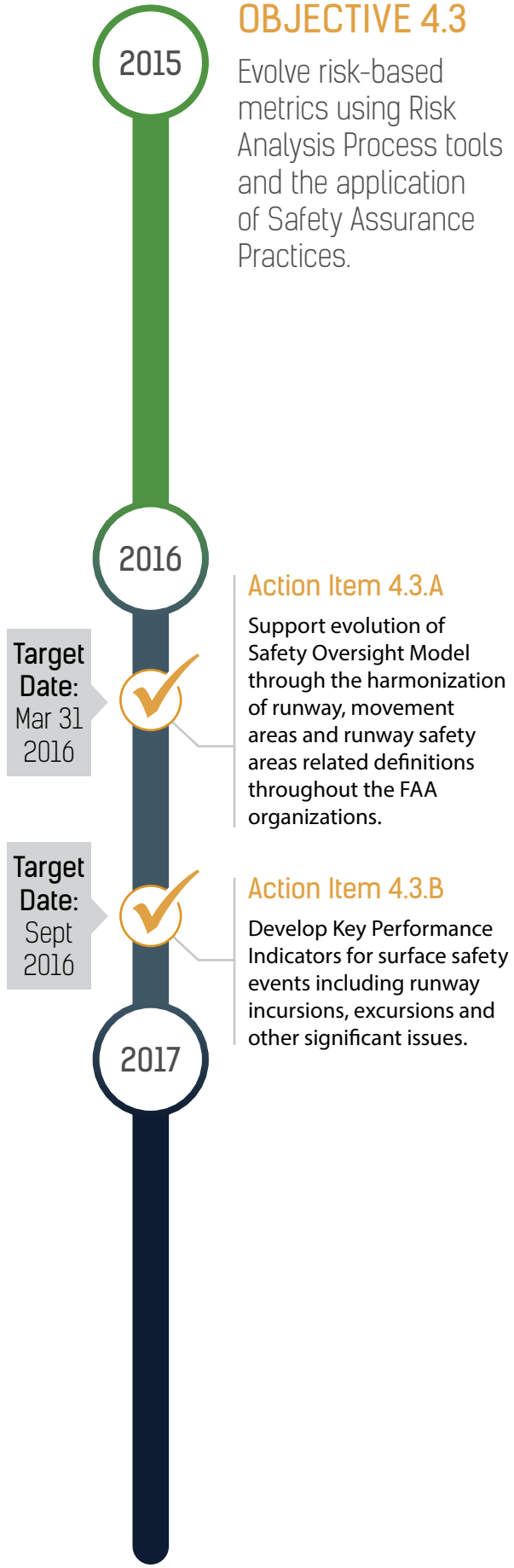


Figure 4-2.
Severity Categories of Runway Incursions

A

A serious incident in which a collision was ***narrowly avoided.***

B

An incident in which separation decreased and there is a ***significant potential for collision,*** which may result in a time critical corrective/evasive response to avoid a collision.

C

An incident characterized by ***ample time and/or distance*** to avoid a collision.

D

Incident that ***meets the definition of runway incursion*** such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.

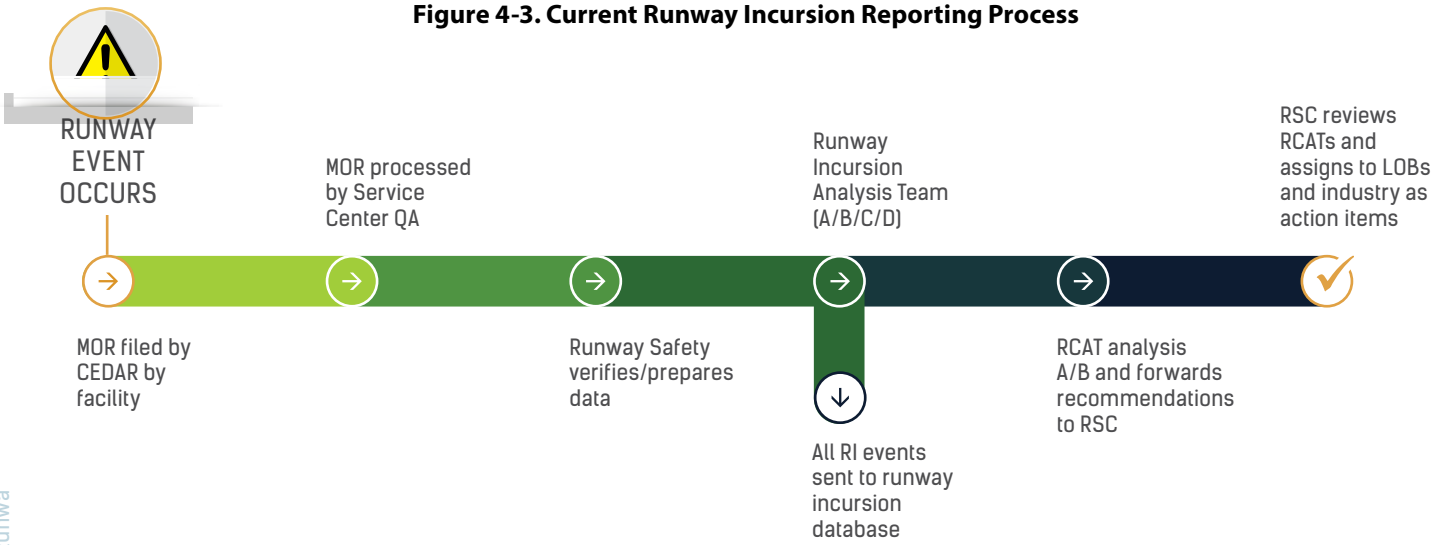
The FAA relies upon the findings of the Runway Incursion Assessment Team (RIAT) to determine the severity of runway incursions. The RSG extracts information regarding runway incursions from ATO safety data collection systems. The RIAT classifies the incident using the severity classification and type of runway incursion definition adopted by the FAA in Order 7050.1B. Figure 4-2 lists the four severity categories of runway incursions.

Classification by type and severity is an event-based system that utilizes agency and industry resources to analyze and identify causal and contributory factors surrounding runway incursions categorized as A or B.

Runway safety results are compiled within the Runway Incursion Statistical Database and posted on the FAA Runway Safety website. Figure 4-3 depicts the current workflow process for determining type, severity and root causes of runway incursions.

This event-based, multi-disciplined approach has led to a reduction of the most critical runway incursion errors. Since FY2000, Category A and B runway incursions have decreased from 67 to just 11[10] in FY2013. Current and historic runway safety performance metrics are located in **Appendix E.**

Figure 4-3. Current Runway Incursion Reporting Process



[10] http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=14895

RUNWAY EXCURSIONS

A runway excursion is a "veer off or overrun from the runway surface."[11] From a classification standpoint, runway excursions constitute an occurrence category and can take place in either the take-off or landing phase of flight. Multiple operational, technological and procedural hazards exist for each type of excursion and contribute to the risk of an excursion. The severity of an excursion can arise from multiple factors including energy of the aircraft, airport layout, airport geometry, weather conditions, and aircraft performance criteria. The Office of Airports is responsible for conducting preliminary investigations of runway excursions of commercial aircraft at certificated airports.

The RSG has established a program to compile runway excursion statistical data and develop runway excursion classification schemes, reportable event statistical registers and contribute to the development of standardized metrics. RSG participated on the Commercial Aviation Safety Team (CAST) chartered Runway Excursion Joint Safety Analysis and Implementation Team and collaborates with international air navigation service providers to develop runway excursion prevention and safety enhancement plans.

An FY2014 Safety and Technical Training Core Business Measure (14S.3) Runway Excursions, and associated Core Business Initiative (14S.3N) and Core Activity (14S.3N1), is in the development of a program to reduce runway excursions. The following key targets are currently associated with this initiative:

Target 1: Develop methodology to capture critical data elements and analyze runway excursion data.

Target 2: Develop system metrics to measure critical hazards contributing to runway excursion events.

Target 3: Ensure that runway excursion data reports are available for individual towers to review during a Runway Safety Action Team meeting.

Target 4: Coordinate reliable and consistent data sharing of safety information between Runway Safety and aviation stakeholders.

Target 3 of Core Activity 14S.80CX: Improved Safety Analysis requires the development of a plan to identify, collect, and analyze data, as well as reduce the risk associated with runway excursions. The ATO and Office of Aviation Safety sponsor multiple activities that seek to identify all of the factors that contribute to runway excursions.

The RSG is working in concert with other stakeholders to develop a classification system for the cause and severity of runway excursion events that aligns runway excursion data collection, analysis capability, mitigation strategies, promotional activities, and reporting protocols with the SMS and other efforts to reduce surface events.

In addition, the RSG is supporting national and global forums to raise stakeholder awareness through the development of mobile apps and participation in information sharing. International partnerships include other Air Navigation Service Providers, the European Commercial Aviation Safety Team, International Civil Aviation Organization (ICAO), and the Civil Air Navigation Service Organization (CANSO).

4.3.1 Development of Surface Safety Risk Assessment Metrics

The aviation industry is guided by a hierarchy of legislative statutes, regulations, orders, policy guidance, advisory circulars and approved operations manuals. Multiple communication media are used to convey the meaning of existing guidance to the users. The development and compliance of procedures designed to mitigate risk on the airport surface depend upon effective communication between multiple layers of human and technological interaction. Evolving risk-based metrics will depend upon harmonized runway safety definitions, standardized taxonomies, and an agency-wide hazard tracking system (Action Item 4.3.A).

The increased scope of the Plan, coupled with growing volume and complexity of air traffic, necessitates the reevaluation of runway safety data collection functions and development of risk-based metrics. This activity supports Goal 6 of the 2012 Strategic Runway Safety Plan: "Create and adopt an FAA-wide common taxonomy and classification system to support proactive risk management, global data integration, and advanced surface safety analytical studies within the FAA's SMS."[12] The sections which follow describe the programmatic elements that will aid the transition from an event-based approach to one that is risk-based and utilizes Key Performance Indicators which measure upstream factors that induce or reduce risk.

[11] FAA Order 7050.1B

[12] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, Nov, 2012. Ch.3, Pg. 8 (Goal 6)

4.3.2 Safety Assurance

The Air Traffic Organization Quality Assurance Program (FAAJO 7210.633) and Air Traffic Organization Quality Control (FAAJO 7210.634) Orders establish and clarify Quality Assurance and Quality Control duties and accountabilities. Quality Control functions ensure the quality of air traffic services is maintained at the point of service delivery. Quality Assurance is responsible for identifying safety trends, ensuring all policies and procedures are followed regardless of source, and that appropriate corrective actions have been developed and implemented. Working in tandem, Quality Control and Quality Assurance systematically provide assurance that appropriate levels of safety are being met or maintained in the runway environment.

Following the guidance in these Orders, the FAA is moving beyond classifying runway incursions based on severity and type (event-based safety). Instead, the agency is assessing the severity of events, predicting repeatability of events, and evaluating the actions taken to address risks (risk-based safety). Event-based metrics are forensic and specific in nature. Risk-based metrics seek to establish risk ratings based on a preponderance of information gathered around leading indicators and apply the findings to future operations.

An event-based view of safety does not require the ability to distinguish between Quality Assurance and Quality Control. Event-based corrective action plans are directed towards an identified party or the party's oversight authority. The FAA's transition to a more systemic, risk-based view of runway safety creates the need to build the ability to differentiate between the issues emanating from point of delivery versus issues emanating from policy and/or procedural deficiencies.

The combination of Quality Assurance and Quality Control feedback loops within the SMS builds in capability to continually assess risk-based metrics, and provides an auditing mechanism to assure adequacy of control measures, effective service delivery operation, and compliance with official guidance. The visibility created by these respective mechanisms supports internal and external auditing activities and the creation of Corrective Action Plans. In addition, differentiation can scale appropriately from audit reports on individual activities to monitoring risk across a broad portfolio.

Audits depend upon the availability and organization of data. Safety assurance in a risk-based environment for runway safety will utilize existing and repurposed functions. Runway Safety Action Teams were initially tasked to survey and assess hazards and risks at specific airports. The evolution of risk-based safety systems will increasingly utilize Runway Safety Action Teams as an auditing and oversight mechanism in place of a hazard identification and mitigation function.

Hazards and actionable items for specific airports will continue to be identified by Local Runway Safety Action Teams and recorded in Local Runway Safety Action Plans. Regional Runway Safety Program Managers will be able to actively audit the Local Runway Safety Action Teams mitigation activity using Quality Assurance safety data sets.

In addition to Local Runway Safety Action Teams, certification inspectors from the FAA Office of Airports, Safety and Standards branch, conduct safety inspections of each certificated airport. As part of that inspection, the condition of airport lighting, marking, signs, and other aspects of airport operations are noted to ensure they meet the requirements specified by the FAA's Advisory Circulars and other regulatory requirements.[13] Discrepancies are recorded in the Certification and Compliance Management Information System. Resolution of findings and discrepancies are ensured by subsequent inspections and enforcement actions if necessary.

The FAA is supporting the evolutionary development of these safety assurance mechanisms through the merging of valuable data sets within the SMS, creating visibility and accountability for the users, auditors, and oversight authorities. Random and periodic audits are facilitated through the creation of common taxonomies, harmonization of risk management processes, and standardization of assessments. Merging multiple data sets and audit processes within the FAA will facilitate comprehensive understanding of the current status of safety management.

4.3.3 Risk Analysis Process

Goal 2 of the FAA's 2012 Strategic Runway Safety Plan states: "Evolve runway safety event risk analysis through a surface Risk Analysis Process and adopt target measures compatible with the System Risk Event Rate process."[14]

The current Risk Analysis Process evaluates airborne Loss of Standard Separation events and facilitates the migration towards a risk-based safety system utilizing a new safety met-

[13] AC 150/5340-1K, Standards for Airport Markings, September 03, 2010; AC 150/5345-53C, Airport Lighting and Certification Program and Addendum, June, 2012

[14] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, Nov, 2012. Ch 3, Pg 8. (Goal 2).

ric called the System Risk Event Rate. The System Risk Event Rate tracks the highest risk incidents, known as a Risk Analysis Event, and measures the rate at which those events occur. This differentiates the raw number of low risk events from events that represent high risk and require corrective action. The System Risk Event Rate tracks safety performance data trends while the Risk Analysis Process utilizes the expertise of aviation risk specialists, pilots, airport safety personnel, and controllers to determine the risk inherent to a risk bearing event and the associated causal and contributory factors.[15]

To meet the requirement of Goal 2, the FAA is developing risk-based decision making for surface issues through development of the Surface Risk Analysis Process (S-RAP). Currently in a demonstration phase, the S-RAP model uses a mathematically derived matrix that applies causal and contextual factors including proximity, closure rates, weather conditions, and pilot and air traffic controller barriers to produce severity ratings (Figure 4-4).

Similar to the current event-based process, S-RAP identifies the causal and contributory factors of all types of surface events involving conflicts, the relationships between actions and consequences, and allows for the development of Corrective Action Requests and Plans utilizing information from stakeholders. Unlike the current process, S-RAP uses the same analysis methodology currently being used in airborne events and the same workflow process, regardless of surface event type classification.

As S-RAP is in a demonstration phase, current agency responsibility for determining runway incursions and surface incidents resides with the RSG and the RIAT. The determination of the severity rating by the RIAT for Category A and B incursions is confirmed and finalized by the RSG Manager prior to including the event in agency statistics. At the end of the S-RAP demonstration period, the RSG, in conjunction with other stakeholders, will review the results of the S-RAP demonstration and develop a surface safety performance metric action plan.[16]

The data collected by S-RAP during the demonstration phase is central to establishing the System Risk Event Rate as the new surface safety performance metric as defined by AJI Core Business Measure 14S.7 (Appendix A). Establishing a surface safety System Risk Event Rate will allow the FAA to accomplish the following:

- *Align its approach to improving safety with international partners.*
- *Integrate controller and pilot performance data on all air traffic incidents.*
- *Evaluate separate incidents caused by other factors, including pilot deviations.*
- *Avoid under-reporting and misclassification of incidents.*

Once fully implemented, the S-RAP will enable the FAA to analyze multiple types of surface events in a more objective, repeatable, and data-driven fashion and compile information regarding the effectiveness of safety barriers. Establishment of a surface event System Risk Event Rate regardless of type classification will utilize and align the data collection, investigation, and analysis capabilities with those currently in use for airborne Risk Analysis Events and create a central repository for NAS risk events.

The Service Integrity Risk Analysis Process (SIRAP) completes the Risk Analysis Program (RAP) suite. The goal of SIRAP is to assess the risk of Service Integrity Events, i.e., maintenance or technical support incidents that compromise the safe provision of airborne and surface air traffic management services. Once operational, SIRAP data will provide consis-

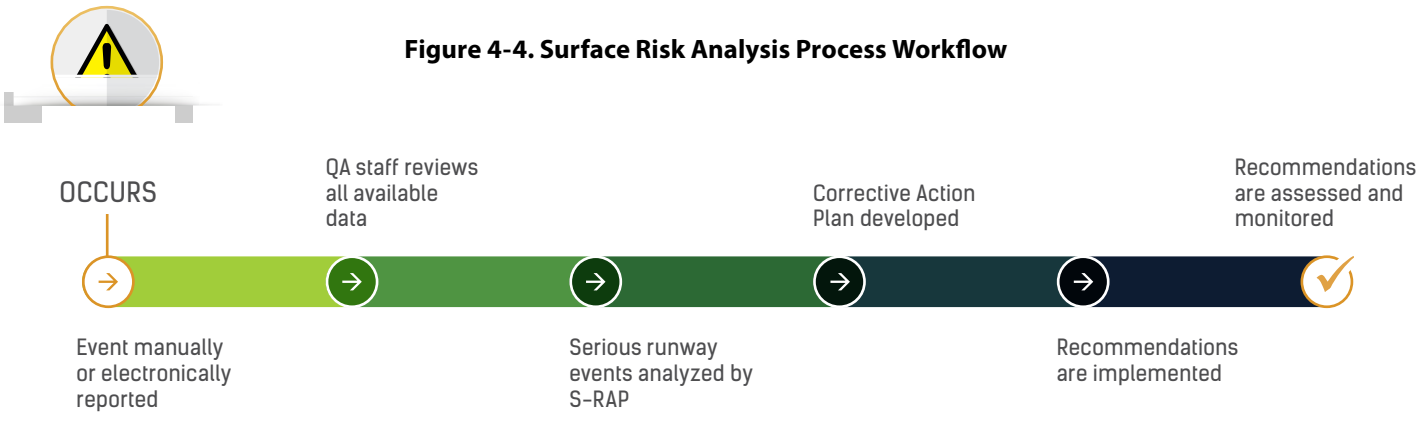


Figure 4-4. Surface Risk Analysis Process Workflow

[15] Additional information regarding RAP, RAE, SRER and the Quality Assurance process are found in Oder JO7210.633

[16] FY2014 Core Business Initiative 14S.3P – Improved Runway Incursion Analysis Capability

tent and fuseable data sets regarding causal and contributory functions of maintenance and technical support issues on surface and airborne safety events.

The overall objective of the RAP suite is to integrate and leverage airborne, surface, and technical-support safety information in order to identify and mitigate risk of existing cross-organizational issues, and guide comprehensive risk-based decision-making in the NAS. Mandatory Occurrence Reports (MORs), based on risk criterion, will provide the data necessary to drive decision making. The net effect will provide an FAA-wide capability to track and report the status of identified hazards, associated risks and status of risk states that affect runway safety. As Key Performance Indicators are developed from algorithms based on data collected through the RAP suite, risk rated leading indicators will allow runway safety investigators to rate operational risk before events occur (Action Item 4.3.B).

4.3.4 Aviation Common Taxonomy V3.0

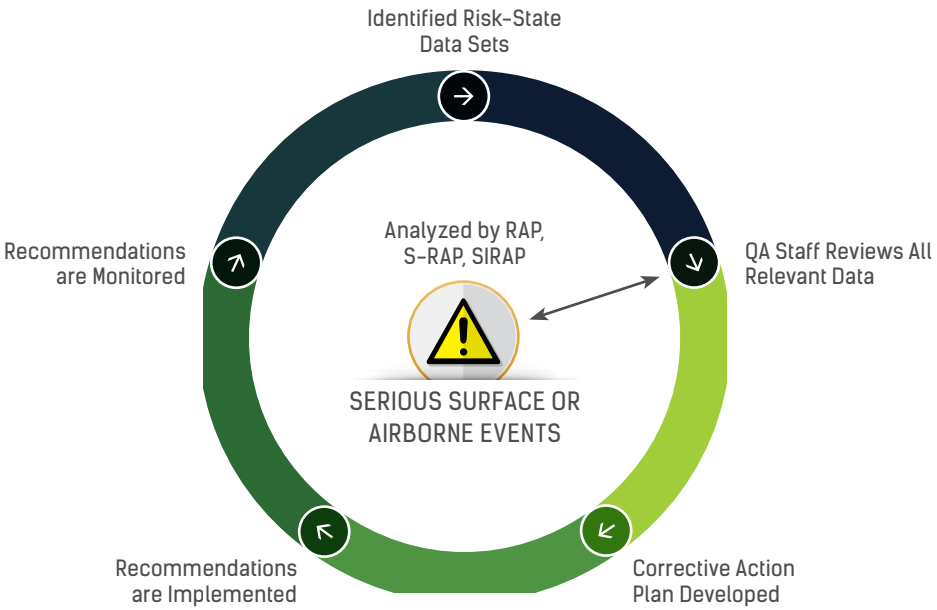
Risk-based safety depends upon the development of a common data language. Integration or fusing of data from sources across multiple lines of business and multiple data repositories is a primary requirement for the development of cross-agency standards, risk-state definitions, and modeling integrity. Common data taxonomies will promote data standardization to ensure consistent sharing of safety data across the FAA and with industry constituents and international peers.

The Air Traffic Common Taxonomy version 3 (ACT v3) provides two overarching benefits with respect to the analysis of safety data. First, it establishes a common safety language that links runway safety event data, surface hazards identified through the ATO safety risk management process, and ATO requirements in a seamless framework. Second, in contrast to current causal factor taxonomies that focus on why an incident occurred, ACT v3 exhaustively classifies all components of a hazard: who was involved in the event (e.g., agents), what was involved (e.g., equipment or infrastructure types), when the event occurred (phase), and why (causal and contributing factors). As a result, the new taxonomy will facilitate more detailed analyses to identify and quantify how different conditions contribute to system risk and will help inform the development of the Risk Analysis Process suite.

4.3.5 Integrated Safety Assessment Model

The Integrated Safety Assessment Model is an integrated pilot and controller model, utilizing safety modeling techniques known as Event Sequence Diagrams which isolate and describe the sequence of events that occur at airports with surface surveillance systems that led to an accident

Figure 4-5. Risk-based Process Workflow



or serious incident. Integrated Event Sequence Diagrams define Fault Trees, which explicitly depict the underlying events that were necessary for the incident to occur. The Integrated Safety Assessment Model has identified the Event Sequence Diagrams which denote runway incursions and is working to identify the causality of the events utilizing this methodology.

The Integrated Safety Assessment Model has two goals:

- *Provide the risk baseline of the current NAS against which the risk of future system changes can be measured.*
- *Forecast the risks and safety impacts of implementing surface safety changes.*

ACT v3 and the Integrated Safety Assessment Model will make significant contributions to the next stage development of the FAA SMS, and are contributing to the achievement of the 2012 Strategic Runway Safety Plan's Goal 6.[17]

When coupled with improved access and availability of harmonized data, the FAA SMS is strengthening its ability to analyze multiple data streams and achieve standardized and repeatable results. Data derived from air traffic and airport operations, engineering, and safety risk assessment sources will provide insight into current system vulnerabilities and help plan future mitigation requirements.

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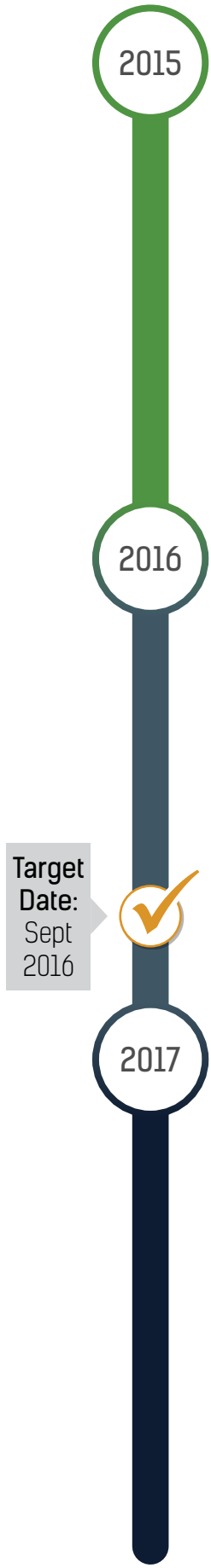
[17] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, Nov, 2012. Ch.3, Pg. 8 (Goal 6)



4.4 FAA Intra-Organizational Alignment to Assure Runway Safety

In the years since the FAA established an office dedicated to addressing runway safety, the aerospace industry has continued to incorporate new ground-based, airborne and space based platforms, and introduce new services, technologies and capabilities. The challenges presented by NextGen will continue to put pressure on the FAA to constantly rationalize and enhance its existing services while at the same time, maintaining or improving its safety record. To address the changing needs of the nation's airports, the FAA is adopting a corporate management approach to surface safety. An objective of the Plan is to establish a new intra-organizational structure that is aligned with the Administrator's strategic initiative of risk-based decision making for surface safety (Action Item 4.4.A).

Runway safety begins and ends at the airport. Multiple activities by airport operators, air traffic, tenants, airlines, maintenance organizations, and oversight by several FAA LOB converge on the airport surface. The current RSG organizational structure supports the present event-based system for determining type and severity of surface events. The transition to a corporately managed, risk-based system will require adjustments to the intra-organizational design to ensure accountability at all levels for all jurisdictional regions and functions.

4.4.1 Current Runway Safety Organizational Elements

RUNWAY SAFETY PROGRAM MANAGER

The Runway Safety Group Manager is responsible for managing the overall efforts of the Runway Safety Group across the country, and for ensuring that their activities are integrated corporately throughout the FAA.

SERVICE AREA RUNWAY SAFETY PROGRAM MANAGER

The Service Area Runway Safety Program Manager ensures harmonization and coordination between the FAA Regions within the Service Area.

REGIONAL RUNWAY SAFETY PROGRAM MANAGER

The Regional Runway Safety Program Manager is responsible for developing and executing an annual Regional Run-

way Safety Plan that aligns with the goals and objectives of the National Runway Safety Plan. Regional Runway Safety Program Managers monitor the accuracy and quality of the group's work and identify facilities that would benefit from an onsite Regional Safety Action Team and/or Comprehensive Airport Review and Assessment. The Regional Runway Safety Program Manager is the RSG representative to the Regional Governance Council.

RUNWAY SAFETY ACTION TEAMS

A Runway Safety Action Team is established at either the regional or local level to develop a Runway Safety Action Plan for a specific airport. The Runway Safety Action Team's primary purpose is to address existing and potential runway safety problems and issues.

RUNWAY INCURSION ASSESSMENT TEAM

The Runway Incursion Assessment Team is composed of members from the Office of Airport Safety and Standards, Flight Standards Service, and ATO Terminal Services. The group meets weekly to review runway incursion events and apply the appropriate severity classification per the FAA's runway incursion definition and severity classification. Tools for analysis include radar replays, written reports, airport diagrams, and voice replays. Each of the team members is a subject matter expert on one facet of airport, flight, or ATC operations.

RUNWAY SAFETY COUNCIL

The Runway Safety Council[18] is a joint government / industry group that develops a focused implementation of integrated, data-driven strategies to reduce the number and severity of runway incursions. The Runway Safety Council performs the following tasks:

- *Reviews and approves the recommendations of the Root Cause Analysis Team.*
- *Reviews, approves, and monitors the implementation plan of each approved recommendation.*
- *Monitors and refocuses activity based on effectiveness of intervention(s).*

Runway Safety Council members include representatives from the following organizations:

- *Federal Aviation Administration*
- *National Air Traffic Controllers Association*
- *Professional Aviation Safety Specialists*
- *Airlines for America*
- *Airline Pilots Association*
- *Aircraft Owners and Pilot Association*
- *National Association of Flight Instructors*
- *Airport Council International – North America*
- *National Business Aircraft Association*
- *Regional Airline Association*
- *American Association of Airport Executives*

ROOT CAUSE ANALYSIS TEAM

The Root Cause Analysis Team was chartered by the Runway Safety Council to analyze serious runway incursions and make recommendations to the Council on ways to improve runway safety. The Root Cause Analysis Team is composed of members from designated Runway Safety Council organizations.

The Root Cause Analysis Team's review and analysis includes a holistic approach with integrated causal and human performance perspectives. Interventions or mitigating solutions are proposed to the Council for consideration and final determination.

VICE PRESIDENT FOR SAFETY AND TECHNICAL TRAINING

In collaboration with the Associate Administrators for Airports and Aviation Safety, the ATO Vice President for Safety and Technical Training is responsible for the overall Runway Safety Program planning and execution, and for the corporate approach to surface risk reduction.

4.4.2 Corporate Surface Safety Organizational Elements

NATIONAL GOVERNANCE COUNCIL

The FAA has established a National Governance Council to aid the development of regional and local accountability. The ATO Vice President for Safety and Technical Training and the Regional Administrators meet quarterly to conduct a program review to ensure that all FAA organizations have effective programs to address identified runway safety deficiencies, review regional and national trends and metrics and promote understanding of an integrated safety picture across the ATO, the Flight Standards Service Organization, and the Office of Airports. The purposes of this council are as follows:

[18] http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=10166

- *Ensure regional initiatives and actions are being accomplished in the appropriate manner and timeframe.*
- *Promote collaboration and enhanced communication among members.*
- *Provide a forum by which appropriately designated issues may be elevated for national review, as necessary.*

The National Governance Council facilitates the exchange of runway safety data and trends, and promotes understanding of the integrated safety picture across ATO, Flight Standards and Office of Airports leadership.

REGIONAL GOVERNANCE SERVICE COUNCIL

Each Regional Administrator has established a regional governance council whose members include the Local Runway Safety Program Manager, an Airports Division Manager, a Flight Standards Division Manager, and the ATO Director of Air Traffic Operations. The intent of the regional council is to ensure regional initiatives and actions are being accomplished in the appropriate manner and timeframe.

A delicate balance exists between sound strategic planning and expert tactical execution, along with the ability to understand how the two interact. A strong local, regional, and national partnership ensures that this balance is maintained and supported.

SURFACE SAFETY INITIATIVES TEAM

The FAA formed the Surface Safety Initiatives Team (SSIT) in September 2013 to refine the current airport surface safety improvement process. Through this team, the FAA is improving the coordination, selection, and prioritization of surface safety initiatives by using a collaborative approach of operational stakeholders.

The purpose of the team is to convene a cross-functional group of FAA operational stakeholders to address airport surface safety issues. Specifically, the team is chartered to perform the following activities:

- *Facilitate effective cross-organizational plans and response strategies to surface safety needs.*
- *Recommend cost effective approaches to resolve known or anticipated surface safety related issues that are affordable to both the FAA and the airports.*
- *Effectively collaborate on potential issue resolution strategies with the FAA, its union partners, and industry.*

During its initial eighteen month charter, the team will research and recommend solutions to current and planned surface safety solutions, as well as address the surface safety requirements for airports impacted by Runway Status Lights re-baselining and cancellation of the Low Cost Ground Surveillance project. At the end of the initial charter, the FAA will evaluate the effectiveness of the team in meeting its runway safety objectives and make a recommendation for altering, extending, or terminating the charter.

COMPREHENSIVE AIRPORT REVIEW AND ASSESSMENT

The primary role of the Comprehensive Airport Review and Assessment (CARA) is to identify, validate, and prioritize root cause operational issues that contribute to runway safety shortfalls at each of the sites within the purview of the Surface Safety Initiatives Team. CARA teams identify and understand hazards and their root causes in an effort to decrease the risks associated with surface incidents, runway incursions, and/or runway excursions. Similar to the Runway Safety Action Team activity, the intent of the assessment is a focused view of any airport to analyze relationships between stakeholders in terms of metrics, infrastructure and guidance, to review compliance issues and mitigation strategies, and to evaluate current and future technologies. This review and assessment also ensures that procedures, practices, and documentation are applied in accordance with applicable requirements and align with the Safety Assurance pillar of the SMS.

CARA teams are largely constituted with resources already engaged in surface safety analysis activity at local sites. As such, the use of CARA teams is an effort to leverage existing FAA runway safety teams and expertise wherever possible. However, the CARA teams differ in the following ways:

- ***Focus:*** *CARA teams produce a single report to support the work of the Surface Safety Initiative Team.*
- ***Span of data analysis:*** *Data analysis likely spans multiple years.*
- ***Core purpose:*** *The purpose is to identify root causes contributing to safety issues, not potential solutions.*
- ***Potential participants:*** *Each team has the latitude, with oversight from the Surface Safety Initiative Team, to draw on subject matter expertise where appropriate or needed.*

CARA team composition must include a clearly-defined core team that is supplemented by all necessary local and headquarters expertise to provide data, input to operational priorities and review accuracy of identified operational shortfalls. Core teams consist of the following members:

- ***Runway Safety Program Manager:*** *Represents the Runway Safety Action Team perspectives, facilitate CARA working sessions, and ensure accuracy and quality of the group's work.*

- ***Airport Operations Manager:*** *Provide operational perspective into the work, make resources available to support the site survey, identify data for analysis, and identify interview personnel.*
- ***Air Traffic Manager from the local airport facility:*** *Provide Air Traffic management and standards perspective into the work (airspace, procedures, emerging local plans for route or other changes, etc.); make resources available to support the site survey, data analysis, and interview(s) with necessary personnel.*
- ***ARP Representative:*** *Provide resources and perspectives necessary to represent the national view of airport standards and guidelines.*
- ***Analyst:*** *Collect and integrate data, attend interviews, assess both qualitative and quantitative findings, provide logistics support to meetings and team requirements, and write the final report.*
- ***National Air Traffic Controllers Association (NATCA):*** *Provide controller input.*

The focus airports for the CARA teams are those undergoing re-baselining of projected surface surveillance technologies and require reevaluation of the surface safety strategies.

AIRPORT CONSTRUCTION ADVISORY COUNCIL

The Airport Construction Advisory Council (ACAC)[19] was established in May 2010 to address surface safety issues associated with disruptions in air traffic operations caused by runway and taxiway construction. Using SRM processes, the council identified weaknesses in the control measures undertaken by the FAA during periods of prolonged construction and has developed a layered suite of mitigations to proactively prevent similar future occurrences. These enhancements include training for controllers, amendments to clearance terminology contained in the Controller's Handbook, and Airport Terminal Information Service broadcasts during periods of shortened runways.

Goal 4 of the 2012 Strategic Runway Safety Plan identified the need to "incorporate Airport Construction Advisory Council activities and data into safety risk management and SMS reporting structures."[20] The RSG supports the council in its mission to ensure the safety of all NAS users operating aircraft and vehicles in proximity to runway or taxiway construction projects. The council will assist the RSG in bringing various FAA lines of business together to address construction issues.

The Airport Construction Advisory Council has developed and will advocate and distribute Runway-Taxiway Construction Best Practices, Lessons Learned and runway construction checklists, located on the FAA Airports runway safety webpage. Council activities are supported jointly by ATO Safety and Technical Training, and Air Traffic Services.

LOCAL SAFETY COUNCIL/ PARTNERSHIP FOR SAFETY

Going forward, a key piece of corporate runway safety management is the air traffic facility Partnership for Safety (PFS). In conjunction with National Air Traffic Controller Association, the FAA established the PFS through FAA Order JO 7200.21, on March 13, 2013. The mission is to facilitate the identification and mitigations of hazards at the local level.[21] The Partnership for Safety establishes the framework for FAA air traffic facilities to establish a Local Safety Council (LSC) to encourage all employees to become proactively engaged in identifying hazards, assessing risks, and developing safety solutions locally. The ATO is required to establish a Local Safety Council at all FAA facilities.

The Local Safety Councils are supported by an ATC Information Hub (Infohub) and a Safety Data Portal, which are web-based portals used for storing and sharing safety information, safety-trend and facility-specific information, gathered from multiple data sources.

The Partnership for Safety uniquely exists at the confluence of local aviation stakeholders and air traffic operations. As controllers and air traffic management engage with local safety stakeholders, they create the ability to address specific issues relating to their unique airspace and airport configurations.

Aligning, tagging, and presenting safety data in context allows Local Safety Councils to turn raw information into local actionable knowledge and safety improvements. By incorporating Local Runway Safety Action Team and Airport Construction Advisory Council activities into facility safety management activities, the Partnership for Safety can become the focal point for local engagement, risk management and safety assurance.

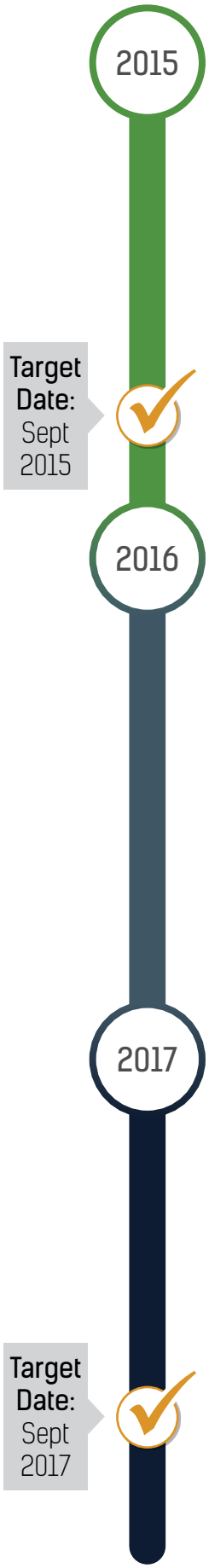
[19] http://www.faa.gov/airports/runway_safety/resources/media/ACAC%20Fact%20Sheet.pdf

[20] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, Nov, 2012. Ch 3, Pg 8 (Goal 4).

[21] FAA JO 7200.21 Effective date March 13, 2013 Mission for Partnership for Safety

OBJECTIVE 4.5

Enhance communication through the development of collaborative training, local leadership and the expanded use of mobile technology and social media.



Action Item 4.5.B

Leverage existing FAA safety organizations as the primary path and channel for engagement.

Target Date: Sept 2015

Action Item 4.5.D

Focus existing partnerships with industry groups, unions, and transportation authorities on the Administrator's initiative of creating safer runways through risk assessment and risk mitigation.

Target Date:
As opportunity arises – ongoing effort

Action Item 4.5.E

Engagement and outreach should be allocated, targeted, and deployed as a force multiplier for Runway Safety initiatives.

Target Date:
Ongoing

Action Item 4.5.A

The tenets of the SMS will apply to all runway safety communication and engagement initiatives and messages.

Action Item 4.5.C

Create an information hub for runway safety: lessons learned, things that work, and resources that can be shared from a central repository.

Action Item 4.5.F

Apply communication resources to empower local safety representatives, service area managers, and district runway safety managers.

Target Date: Sept 2017

4.5 Communications Strategy and Engagement

Communication and engagement are essential to the Plan. Communicating directives, plans, processes, methods, outcomes, and successes are necessary to effectively focus and motivate the FAA workforce. Engaging with key stakeholders, safety experts, frontline employees and FAA organizations enables safety to advance towards the goal of reducing safety risk at airports. Multiple action items exist for this objective and are embedded in this section.

The Safety Management System in the FAA enables communication and engagement as a core foundational component called Safety Promotion. Specifically, Safety Promotion is the communication and distribution of information to improve the safety culture, and the development and implementation of programs and/or processes that support the integration and continuous improvement within the ATO.[22] A key function of Safety Promotion is creating communication channels between personnel on the operational front line and the appropriate safety organization (Figure 4-6).

Inside the framework of the SMS, communication and engagement for runway safety will take place on a dynamic, vertical, and horizontal axis, and will be aligned through specific channels already existing in the FAA organizational structure. Vertical engagement will ensure that national safety offices and headquarters staff, as well as field management and service center support staff, are fully committed and active in mitigating runway safety risks. Horizontal engagement will focus on complementary safety programs in an effort to maximize resources and safety outcomes across the agency.

Communication and engagement will be coordinated and managed within the RSG. This central coordination effort will ensure that communication strategies and engagement plans maintain direct connection with key program managers, field offices, and ultimately frontline employees.

The RSG will promote key elements from the runway safety plan through existing programs and field offices equipped and mandated to improve runway safety. Essentially, moving up and down the FAA's and ATO's formal organizations, the RSG will leverage experienced managers and safety leaders from the workforce to engage with and promote

Figure 4-6. FAA SMS Safety Culture

[22] SMS Manual Version 4.0, Chapter 1; FAA Air Traffic Organization, April 29, 2014.

voluntary reporting, local safety councils, industry safety groups, pilots, engineers, airport managers and other runway safety stakeholders.

The goal is to have a top-down and bottom-up engagement with local facilities and area managers so that a collaborative, integrated communications data stream provides information and feedback to employees who have the ability to drive safety risk down and improve performance.

As a strategy, the following hierarchy will be used for engagement: air traffic facility, service area directorates, regional offices, and national safety programs. This local first strategy will allow more resources to be applied to promote a positive safety culture while engaging frontline employees with "Lessons Learned," facility specific information, and relevant runway safety data.

Geography poses challenges in reaching employees and safety stakeholders with appropriate runway safety messages and data. To have the greatest impact, up-to-date and standardized communications and engagement must occur across the entire United States, its territories and to an international audience of pilots and air carriers. While sending key messages is less challenging with the use of internet technologies, engagement with FAA employees and safety stakeholders is a demanding and ongoing task.

4.5.1 Audiences

The engagement strategy for the Plan will impact target audiences inside the FAA and externally among pilots, airport operators, and air service providers.

Primary audience: Safety stakeholders including pilots, air carriers, airport operators and air service providers. This target group includes general aviation organization and professional associations.

Secondary audience: The FAA workforce directly responsible for air traffic safety and efficiency. This audience is made up of controllers, frontline supervisors, facility management and Aviation Safety and Airports.

Tertiary audience: Safety professionals including inspectors, flight standards personnel, and FAA organizations that directly impact aviation safety, runway projects, and air traffic control procedures.

4.5.2 Strategic Actions for Workforce and Stakeholders

Six strategic action items will drive the communications and engagement objective for the FAA workforce, safety stakeholders, and safety professionals (Objective 4.5 Action Items).

ACTION ITEM 4.5.A
The tenets of the SMS will apply to all runway safety communication and engagement initiatives and messages

Relevant policies, processes, relationships and organizations working in the SMS will impact communications and engagement actions. Promoting and disseminating the SMS foundational components will ensure a disciplined, consistent engagement plan that aligns with strategic objectives that promote runway safety outcomes for all users. Key messaging and training material from the SMS will be leveraged and communicated where appropriate so that engagement is based on common themes central to safety standards and practices.

a. *Update SMS training with an added emphasis on creating local corrective actions, and monitoring and measuring performance at the facility level, including specific references to runway safety and direct examples of the SMS working to improve safety on taxiways and runways.*

b. *Distribute SMS training to a wide-range of audiences inside the FAA and to safety stakeholders.*

c. *Leverage All Points Safety campaign to reach field safety advocates who can distribute SMS material.*

ACTION ITEM 4.5.B
Leverage existing FAA safety organizations as the primary path and channel for engagement

ATO Safety and Technical Training, the Office of Airports, and Aviation Safety have established effective programs and working groups that are implementing strategic initiatives in the NAS. Among others, the Partnership for Safety, Recurrent Training, Quality Assurance, Airport Construction Advisory Council, FAA Safety Team, and Safety Risk Management are effectively driving safety performance. Channeling communications through existing safety initiatives will ensure that relevant messages are reaching safety stakeholders, the FAA's workforce, field managers and district offices.

a. *Engage with program managers and group directors to promote runway safety through existing initiatives. Create action plans in coordination with Partnership for Safety, Quality Control and Air Traffic Safety Action Program.*

b. *Add Runway Safety initiatives to monthly facility safety briefings.*

ACTION ITEM 4.5.C

Create an information hub for runway safety: lessons learned, things that work, and resources that can be shared from a central repository

Good information and resources are currently available. This information needs to be gathered into one location, categorized, and advertised for dissemination to key runway safety staff. Evaluate the merits of using the current Infohub from Partnership for Safety so that lessons learned, leadership initiatives, and model partnerships can be promoted and published.

a. *Engage with the Partnership for Safety Infohub portal to highlight runway safety data that will directly benefit LSCs.*

b. *Increase awareness and publicity on risk hot spots located on runway surfaces. Push notices to air carriers and pilot groups.*

c. *Utilize existing mobile platforms to push hot topic issues on runway safety.*

ACTION ITEM 4.5.D

Focus existing partnerships with industry groups, unions, and transportation authorities on the Administrator's initiative of creating safer runways through risk assessment and risk mitigation

Leverage existing relationships with pilot associations and aircraft owners as well as air carriers, airports, and workforce unions. Pockets of excellence that are actively promoting runway safety and communicating with pilots, air carriers, and local workforces need to be accessed and empowered. Safety advocates in industry and aviation interest groups can carry runway safety messages to key demographics. This fundamental shift in safety culture is important to deliver at events like the Bombardier Safety Stand-down, Aircraft Owners and Pilots Association conferences, Experimental Aviation Association's annual Air Venture, Sun N Fun Fly In, National Air Traffic Controllers Association's Communicating for Safety Conference, and National Business Aircraft Association Top Safety Focus initiatives.

a. *Develop briefings and presentation for industry safety stand-downs like the Bombardier event.*

b. *Improve and promote the public facing Safety and Technical Training web sites to be more effective at getting critical information to runway safety stakeholders.*

c. *Improve and promote existing mobile web sites that provide runway safety data to controllers, pilots and international aviation organizations.*

ACTION ITEM 4.5.E

Engagement and outreach should be allocated, targeted, and deployed as a force multiplier for Runway Safety initiatives.

Reaching local safety champions is a key element for effectively moving runway safety to the next level. The use of internet technology and mobile techniques to display and disseminate critical data to safety stakeholders and local safety councils will be vitally important. Transferring collective safety knowledge to local air traffic facilities and pilots must take advantage of modern forms of technology. Existing data and training material needs to be repurposed using mobile devices so that a larger audience can access and benefit from critical runway safety information.

a. *Promote and enable jointly developed, concurrently delivered recurrent training to pilots and controllers for topics relating to runway safety. Topics may include new procedures, operation policy, air traffic control language.*

b. *Engage with and promote the Confidential Information Share program between airlines and the FAA. Fostering better understanding between controllers and pilots and coordinating responses to corrective action requests will enable safer outcomes.*

ACTION ITEM 4.5.F

Apply communication resources to empower local safety representatives, service area managers, and district runway safety managers

Engagement efforts will place relevant safety information into to the hands of managers and controllers who are already in place as runway safety advocates. Operational safety on the runway is performed one flight at a time at the local facility, so reaching frontline employees is the priority. Safety processes, analysis techniques and mitigations need to be organized and delivered to ATC facilities. An effective way to reach frontline staff is to develop a tool set that may include data charts, runway configurations with highlighted hotspots, runway safety metrics and lessons learned from implementing Corrective Action Requests. Another way to advance runway safety is to provide guidance and materials to regional offices on how to conduct effective outreach when resources are limited. Cultivating a safety centric workplace that encourages and reinforces positive safety action will serve to improve safety performance on runways and taxiways.

a. *Develop and cultivate a master list of facility managers, service area directors, runway safety advocates and NATCA facility reps so communication and key messaging can be directly sent to the most relevant personnel.*

b. *Maintain a mailing list of local Partnership for Safety personnel so that runway safety data, information sharing and update briefings can be targeted towards local safety experts.*

5.0

FAA Corporate Runway Safety Management

Maintaining safety on the nation's runways is the responsibility of all aviation stakeholders. Previous editions of the Plan identified the resources, targets, timelines, initiatives and performance metrics for each FAA office, in accordance with the effective Runway Safety Order. This section of the Plan addresses compliance with the Order (7050.1B) and also describes the agency's move towards a collaborative 'corporate' management approach that builds upon existing processes and directly addresses the challenges on the nation's airport surfaces. Aligning with the agency's Strategic Priorities, the corporate approach pools agency-wide coordination, selection, and budgets to prioritize and identify NAS-wide risk reduction runway safety initiatives.

Intelligent risk-based decision making arises from the components and risk-management capabilities that constitute the SMS framework. By leveraging, integrating and managing the data flow within the FAA SMS, runway safety is transforming into a corporately managed and resourced program. Integrating runway safety efforts across intersecting agency organizations will take advantage of the growing availability and sources of safety data as well as powerful systemic and local analytical capabilities.

The following organizations are collaboratively engaged with runway safety initiatives at multiple levels and in varying degrees through the collection of runway safety data, analysis and modeling of assumptions, recommendation of safety enhancements, and monitoring the results of mitigations. Through their individual charters, each organization provides perspective that supports the risk-based decision making across the runway safety spectrum. As the focal point for the agency's runway safety efforts, the RSG is the corporate entity responsible for coordinating and managing the information derived from each organization or initiative and produces appropriate artifacts when requested by agency decision makers.

5.1 Commercial Aviation Safety Team[23]

The Commercial Aviation Safety Team (CAST) contributes significantly to runway safety efforts. Formed in 1998, CAST is a partnership between government and industry including the Department of Transportation, FAA, National Aeronautics and Space Administration (NASA), Transport Canada, European Aviation Safety Agency, Department of Defense, Flight Safety Foundation, National Air Traffic Controllers Association, Air Line Pilots Association, regional, national and international airline associations, and manufacturers. CAST utilizes a data-driven, risk-centric, consensus approach to identifying and resolving significant commercial aviation

[23] http://www.faa.gov/news/fact_sheets/news_story.cfm?newsId=15214

safety issues. Working in conjunction with government and industry, CAST achieved a significant national goal in 2008 of reducing the commercial aviation fatality rate by over 80% in a single decade.[24]

Moving from a forensic approach to a proactive approach that identifies and mitigates risk before serious incidents occur, CAST is working towards further reducing the U.S. commercial aviation fatality rate by 50 percent from 2010 to 2025 by using and analyzing multiple data sources including those found in the Aviation Safety Information Analysis and Sharing (ASIAS) program. In support of this goal, the CAST Joint Safety Analysis Team is developing safety enhancement recommendations to reduce the risk of runway overruns and other pavement excursions.

5.2 General Aviation Joint Steering Committee[25]

The General Aviation Joint Steering Committee is a government and industry group formed in 1997 as part of the Safer Skies FAA initiative to achieve significant reductions in fatal accidents by 2007. Safer Skies was comprised of three different teams with similar goals to improve aviation safety: CAST, the General Aviation Joint Steering Committee, and Partners in Cabin Safety. These groups use a disciplined, data-driven approach to finding root causes and determining the best actions to break the chain of events that lead to aircraft accidents.

The General Aviation Joint Steering Committee program was revitalized in 2011, and adopted an approach similar to CAST to develop specific interventions targeted towards the general aviation community to reduce the number and rate of fatal general aviation accidents. Like CAST, the committee combines the expertise of many key decision makers across different parts of the FAA, various government agencies, several general aviation associations, and aviation industry representative groups:

- *FAA: Air Traffic Organization, Flight Standards Service, Aircraft Certification, and the Office of Airports.*
- *Other government agencies: NASA and the National Weather Service*
- *Several Associations including[26]:*
  - *Aircraft Owners and Pilots Association*
  - *Experimental Aircraft Association*
  - *General Aviation Manufacturers Association*
  - *Light Aircraft Manufacturers Association*
  - *National Air Transportation Association*
  - *National Business Aviation Association*
  - *Center for Excellence for General Aviation Research*
  - *General Aviation Manufacturers Association – National Association of Flight Instructors*
  - *Insurance representatives*

5.3 Airport Infrastructure and Runway Safety Areas Collaboration

Since 2000, the FAA has established a target of improving Runway Safety Areas at commercial airports by 2015. The U.S. has approximately 550 commercial service airports and 1,020 commercial service runways. Of these, about 90 percent have been improved to the extent practicable.

Improving Runway Safety Areas is congressionally mandated in accordance with Public Law 109–115, 119 Stat. 2401. The improvements to be completed by airports are on schedule for completion by the end of calendar year 2015. Approximately twenty-seven projects are ongoing in 2014. Improvements can involve any combination of the following projects:

- *Establishing and constructing the Runway Safety Area (RSA).*
- *Modifying or relocating the runway.*
- *Installing Engineered Materials Arresting Systems in runway overrun areas.*
- *Implementing declared distances on runways (the maximum distances available and suitable for meeting takeoff and landing distance performance requirements).*

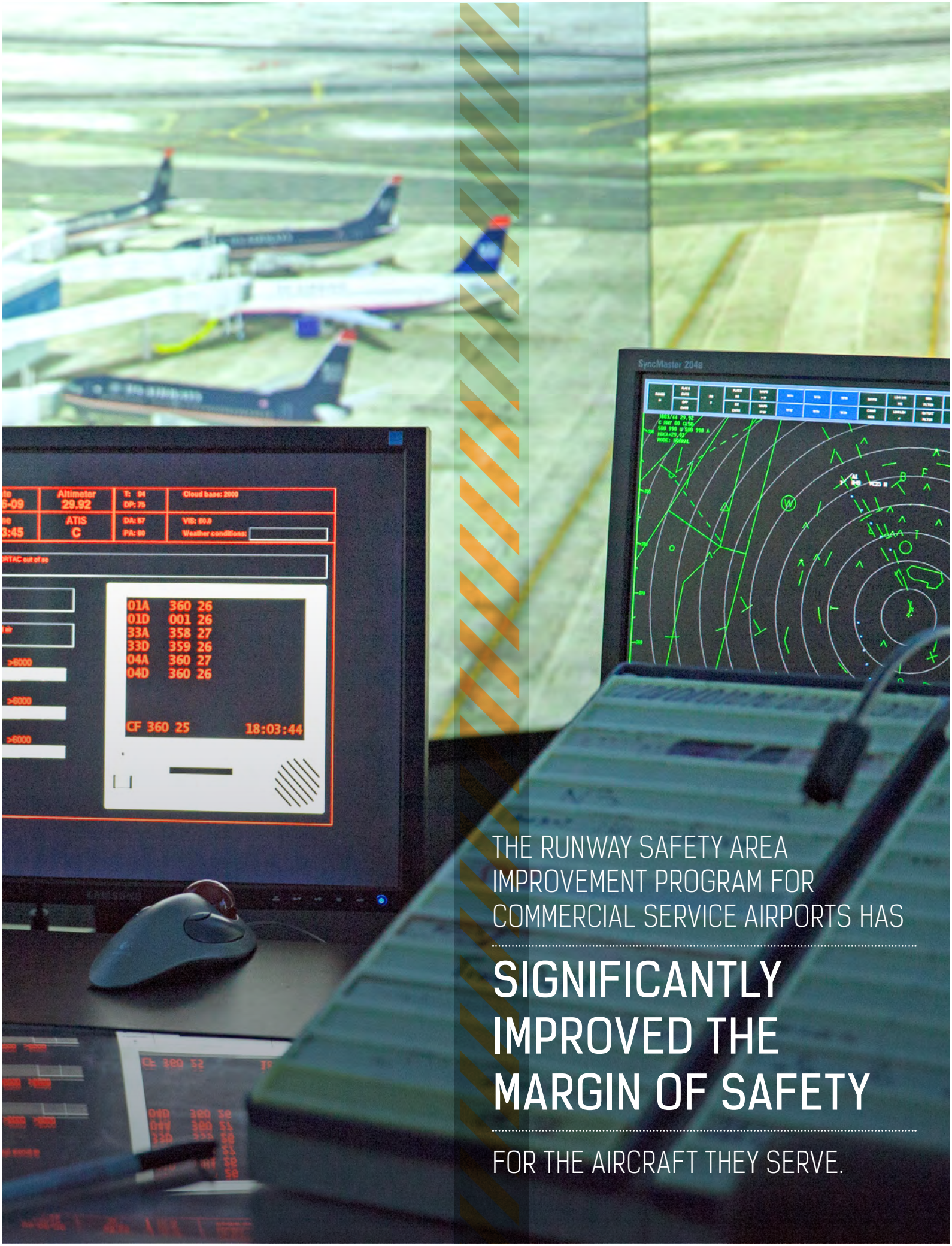
The Runway Safety Area improvement program for commercial service airports has significantly improved the margin of safety for the aircraft they serve. To date, the Engineered Material Arresting System (EMAS) systems have been credited with saving nine aircraft and approximately 240 lives. Many other aircraft have benefited from runways meeting Runway Safety Area standards.

The Airports Engineering Division is identifying and developing a baseline for non-standard geometric conditions that contribute to runway safety risk. Using this baseline, ARP will update the list of airports with a history of incursions where geometry issues may have been a contributing factor. Visibility into shared findings will help ensure new construction is carried out with regard to problematic geometric conditions. Lessons learned will enable the FAA to identify and predict future associated airport safety risk.

[24] White House Commission on Aviation Safety, 'Safer Skies' Initiative, February 12, 1997

[25] http://www.gajsc.org/

[26] Not an inclusive list. Current membership in the GAJSC may be found at: www.gajsc.org



THE RUNWAY SAFETY AREA IMPROVEMENT PROGRAM FOR COMMERCIAL SERVICE AIRPORTS HAS

SIGNIFICANTLY IMPROVED THE MARGIN OF SAFETY

FOR THE AIRCRAFT THEY SERVE.

6.0 Runway Safety Data Collection and Analysis

The most important function of any safety data reporting system is to validate, collate, analyze, and utilize data to guide directional change towards safer and more reliable operations. This effort depends upon the safety systems' ability to fuse different types of data. The FAA is developing an enterprise-level hazard tracking system that provides tiered access levels to give stakeholders appropriately scaled visibility into the SMS and status of current ongoing safety investigations and reports.

The Safety Management Tracking System supports several agency efforts that involve the collection of runway safety data sets. A critical target for the FAA is the fusion of data that will provide access and clearer understanding of runway safety issues. New tools are increasing access and awareness of specific runway safety risks. Data sharing supports the safety community as the FAA transitions to a risk-based aviation system. The move to address performance metrics and develop closer collaboration with airline safety organizations will provide global understanding of where risk exists in the system.

6.1 Existing Runway Safety Data Collection and Dashboards

Several existing safety databases and information collection systems have contributed to the FAA's success in improving safety on the nation's airports.

6.1.1 Runway Incursion Database

The Runway Incursion Database, created and maintained since the 1990's, provides an automated capability to identify, analyze, and monitor trends affecting runway safety. With 77 individual data attributes, the database provides the FAA with a status of specific runway safety issues. At an internal level, the data is used by the RSG for the following tasks:

- *Statistical forecasting*
- *Hazard identification*
- *Planning of work programs*
- *Scheduling of personnel resources*
- *Tracking effectiveness of program activities/ interventions/ strategic initiatives*
- *Providing the FAA a stable platform to understand the intended and unintended consequences associated with testing new technologies*

The Runway Incursion Database fuses data and combines data elements from different sources, within the FAA in order to reveal and highlight unseen latent hazards. The volume of data allows analysts and modelers an opportunity to ask critical safety questions to help the FAA identify precursors to accidents or incidents and provide resolutions and mitigations before accidents or incidents occur.

A unique aspect of the database is its transparency. Many of the data attributes maintained in the Runway Incursion Database are available to the general public on the ASIAS web page, allowing students, pilots, airport managers and other aviation professionals access to the data to address their specific requirements. The consistency of data also provides statisticians a valuable source to perform higher level statistic studies.

The Runway Incursion Database has provided knowledge and understanding to advance surface safety over the past 16 years and is expected to continue to serve the FAA, industry partners, and other government agencies as a stable data collection and analysis platform well into the future. With further advances in automation, the FAA will continue to evolve the system by incorporating standard safety taxonomy and causal factor identification.

6.1.2 Runway Safety Tracking System

The Runway Safety Tracking System is a web-based database application employed by the RSG to track events, action items, documents, and other information pertinent to the runway safety mission at FAA. The primary data sources are regional and local Runway Safety Action Team meetings. Other sources for action items include Hotline Complaints, ATO Investigations, Air Traffic Safety Oversight Service Investigations, Office of Inspector General Investigations, Commercial Aviation Safety Team initiatives, Runway Safety Council, and other events that generate collaborative runway safety action items.

The Runway Safety Tracking System is used by the RSG for file storage, file retrieval, and hazard tracking. The system stores and sorts regional program activity information, such as Regional Safety Action Plans and specific action items. Action items are developed to address airport risks, and then entered into the system by RSG personnel. Regions may have as many as 2,000 action items, some of which are not funded, and others which are ongoing. The system allows the RSG to track these items to completion and see a quantitative analysis of accomplishments. The open and completed action item lists are Key Performance Indicators for the ATO and are posted on the ATO Safety Dashboard.

6.1.3 Comprehensive Electronic Data Analysis and Reporting (CEDAR) System

A critical data source of air traffic runway safety data is the newly implemented CEDAR system. This system recently replaced the manual safety event reporting system used for record keeping, documenting, collecting, and processing safety event reporting in air traffic facilities and will streamline many functions that facility Air Traffic Managers, Quality Control Managers, and Front Line Managers use to execute their responsibilities.

Nine reports are currently available in the system. Six of these reports concern safety features:

- *Mandatory Occurrence Reports*
- *Electronic Occurrence Report*
- *System Service Review and Covered Event Review*
- *Operational Skills Assessment*
- *Checks and Validations*
- *Key Performance Indicators/Traffic Management Review*

The system stores safety data, including manually reported data, reports involving runway safety hazards. Supporting data (radar replays or voice data) are stored in the system and are then available for analysis and review. Subsequent development will provide runway safety analysts with a customized risk form for reporting runway incursions, excursions, and confusion events. The system is automating the creation, management, and storage of facility activities and events, briefing items and FAA forms.

For the timeframe incorporated within the Plan, algorithm research is underway which may lead to the development of additional surface safety Mandatory Occurrence Reports and Key Performance Indicators. The additional Mandatory Occurrence Reports under consideration supports the transition to risk-based surface safety analysis and include:

- *Missed Approach*
- *High Energy Approach*
- *Final Approach Overshoot*
- *Risk of Runway Overrun*
- *Paired Approach Overshoot*
- *Arrivals and Departure on Short Runway*
- *Runway Crossings*
- *Multiple Aircraft/Vehicles on Runway*
- *Rapid Deceleration (During Final Approach and on Airport Surface)*
- *Runway Operations Sequencing*

6.1.4 Certification and Compliance Management Information System

The Certification and Compliance Management Information System (CCMIS) is an FAA Airports data system that tracks and documents safety inspections and compliance with Part 139.

FAA commercial service airports are classified in Title 14 CFR, Part 139, within the United States. Currently, there are 544 Part 139 commercial airports. All Part 139 airports are required to undergo a certification inspection to determine whether each meets minimum standards, including lighting, signs, and runway and taxiway markings. The Airport Certification Program Handbook, FAA Order 5280.5C, dated September 8, 2006, provides FAA personnel with the policies, standards, and procedures to conduct the airport certification process. This Order also "ensures standardization and uniformity in the application of the program and in enforcing Title 14 CFR, Part 139, Certification of Airports."

6.1.5 Aviation Safety Information and Analysis Sharing (ASIAS)

Because runway safety is a responsibility shared by pilots, air traffic controllers, and airport vehicle drivers, the FAA is enhancing the means to analyze broader sets of data from as many sources as possible through the Aviation Safety Information and Analysis Sharing program. ASIAS connects multiple proprietary and publically available safety databases. This multi-faceted collection of shared operational data contributes contextual understanding of relevant surface safety risks and aids in the development of actionable mitigations for the entire aviation community. ASIAS merges diverse safety related data from public and confidential data sources to develop composite snapshots of current operations.

6.1.6 ATO Safety Dashboard

The ATO Safety Dashboard displays real time information extracted from several FAA databases, including statistical information for runway incursions. An important promotional tool of the SMS, outputs from the RSG roll up to the dashboard and are available to relevant FAA organizations and personnel.

6.2 Evolving Runway Safety Data Collection

According to ICAO, the number of significant runway excursions has not decreased in over 20 years. With the addition of runway excursions to the scope of runway safety, the FAA is establishing the methodology to collect, categorize, and assess relevant data. The FAA participates with multiple regulatory agencies and industry groups to develop actionable plans around the prevention of runway excursions including the ability to merge appropriate data within various FAA organizations. The RSG is the focal point for these efforts.

6.2.1 Runway Excursion Database and Dashboard

The RSG is reviewing existing sources of data and data collection methods to begin populating the Runway Excursion database. The primary tasks for the initial development of the Runway Excursion Database include:

- *Defining the severity classification and hazard identification processes.*
- *Providing capability to support communication and outreach activities.*

Future versions of the CEDAR system will support the collection of relevant runway and pavement excursion diagnostic attributes as the RSG migrates towards S-RAP for analysis of excursion events.

Success metrics modeled after runway incursion metrics will be displayed on the ATO safety dashboard as a means to identify the number of safety improvements identified compared to the safety improvements implemented.

6.2.2 Safety Portal Data

A local facility's Partnership for Safety represents a collaborative approach to engaging the workforce in the search for developing mitigations to leading indicators of hazards. The key enabler of Partnership for Safety is access to objective safety data at the facility level. Quantitative and objective safety metrics are computed regularly and delivered to the local safety council through a secure data portal. This integration and sharing of relevant and timely aviation safety information is the foundation to the function of ATO's safety management system.

The Safety Data Portal enables the integration, collaboration, and dissemination of relevant data for key safety risks. Additionally, the Safety Data Portal provides facility-level benchmarks to support local operational safety assessments. Development of metrics applied to aggregated national data sets can be used to create a point of reference for individual facilities and provide a basis to perform operational safety assessments of their own operations. To facilitate the development of facility-level benchmarks, facility cohorts were developed. These cohorts provide an objective way of comparing results across like facilities yielding a better comparison of rates and trends.

An important feature of Safety Data portal is a set of safety metrics developed utilizing radar track data fused with other aviation and weather data to allow for causal and classification analysis of leading indicators of risk. These metrics provide the local safety council with the ability to track and trend safety risks that were previously undetectable. Additionally, the surveillance-based metrics provide the local safety council the ability to track the efficacy of their local mitigations while providing a quantitative input to the safety risk management process.

Local Runway Safety Action Plans generate action items and measures that provide the basis for the development of local metrics. Currently tracked in the Runway Safety Tracking System, access by the Local Safety Council of local action items through the Safety Data Portal will create visibility into the assigned status of risk mitigation efforts at the local level.

Integration of Airport Construction Advisory Council and Local Runway Safety Action Plan information to the facility Safety Data Portal will be a force multiplier for the RSG efforts and enable the frontline employees to participate daily in runway safety enhancements at the local facility level.

LOCAL RUNWAY SAFETY ACTION PLANS

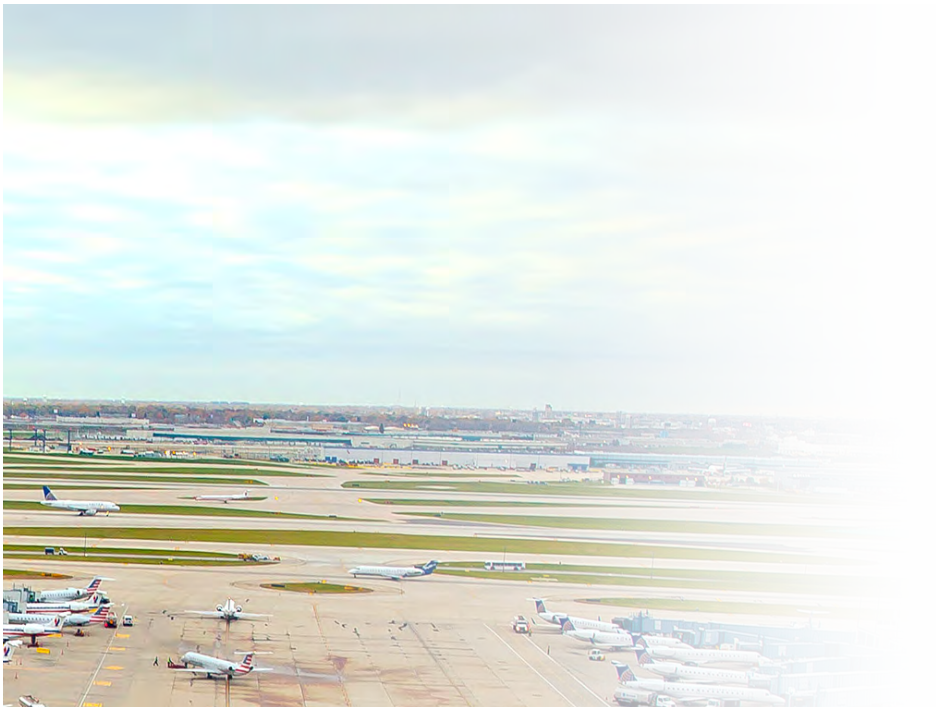
GENERATE ACTION ITEMS AND MEASURES

THAT PROVIDE THE BASIS FOR THE DEVELOPMENT OF LOCAL METRICS.

7.0

FAA Runway Safety Core Business Processes and Methodology

Since 1999, the RSG has made measureable progress toward adopting a portfolio-based approach to runway safety. Methods the RSG has employed include active participation with airport stakeholders, familiarization with air traffic and air carrier procedures, and developing a working understanding of the underlying technology. The RSG has provided the focus, forums, and communication from the top-down and bottom-up. The RSG brings together technical personnel with operational backgrounds including Air Traffic, Flight Standards, Technical Operations, and Airports, and reaches out to every segment of the airport community. This cross-disciplinary, enterprise approach has enabled the office to coordinate and promote runway safety across multiple lines of business. Runway safety personnel facilitate solutions, serve as consultants, and bring people together to solve problems.



Building upon this approach, the FAA continues to strengthen and harmonize runway safety activities within individual FAA organizations, utilizing shared data resources, modeling activities and communications channels. FAA Business Plan activities align resources and focus around specific runway safety goals, initiatives, and targets. Appendix A provides specific information regarding the FAA's 2014 activities. Subsequent year allocations and targets are available on FAA websites.

7.1 Airports

The FAA Office of the Associate Administrator for Airports completed a comprehensive study of aviation safety risk in June 2013. Working with the William J. Hughes Technical Center, ARP examined nearly 17,000 accidents and incidents and categorized each based on contributing factors from airport infrastructure and airport operations perspectives. This study identified the following top airport risks:

- *Airport Geometry that does not meet standards*
- *Runway Incursions and Excursions*
- *Wildlife Strike Hazards*

The Office of Airports is keeping current with the status of runway excursions and incursions by publishing a quarterly action plan that reviews metrics and milestones.[27] This plan will help Airports prioritize and support the most effective measures for increasing aviation safety at airports.

7.1.1 Airport Geometry Analysis

The June 2013 Airport Risk Analysis report indicates that confusing runway geometry is a risk area for runway incursions. Typically, confusing or ambiguous runway/taxiway intersections contribute to runway incursions and are often identified as hotspots on the airfield. Looking beyond the completion of the RSA improvement program in 2015, Air-

[27] FAA Airport Safety & Operations Division, AAS-300

ports is studying how airfield geometry can be improved to reduce the risk of runway incursions. The organization is cataloging known conditions where airfield geometry may contribute to runway incursions and is entering the information into the Airports Geographic Information System to be able to track and analyze potential improvements for safety enhancements. The initial phase of this effort should be ready by October 2014.

7.1.2 Runway Safety Areas (RSA)

The RSA is an area centered about the runway that is typically 500 feet wide and extends 1,000 feet beyond each end of the runway. It provides an unobstructed, cleared, graded area in the event that an aircraft overruns, undershoots, or veers off the side of the runway. The RSA should provide a surface which will enhance the deceleration of aircraft that leave the runway surface but should not hinder the movement of rescue and fire fighting vehicles or any other aspect of emergency response activity.

The FAA is in the final stages of improving RSAs at all certificated Part 139 commercial service airports by the end of calendar year 2015. RSAs are often deficient because many airports were built before the present 1,000 foot RSA standard was adopted approximately 20 years ago.

In some cases, it is not practical to achieve the full standard RSA due to lack of available land. Other obstacles may exist, such as bodies of water, highways, railroads, populated areas or severe drop-off of terrain. Where practicable, airports use the FAA-developed EMAS technology to provide equivalent protection for runway excursions. EMAS uses crushable concrete placed at the end of a runway to stop an aircraft that overruns the runway.

The Office of Airports prepared an RSA improvement plan in 2005 to track progress and to direct federal funds for making all practicable improvements, including the use of EMAS technology. Of the approximately 1,000 RSAs at these airports, an estimated 94 percent have been improved to the extent practicable. In some cases, Navigational Aids (NAVAIDs) also need to be modified or removed from the RSA to meet full standards. While all of the RSA construction improvements will be complete by 2015, some outstanding NAVAID improvements will not be completed until 2018. Nevertheless, the FAA is eliminating a significant hazard associated with runway excursions. The RSA improvement program has accounted for nine aircraft saves affecting 240 people. EMAS is a significant component of the RSA improvements. As of April 2014, EMAS is installed on 74 runway ends at 47 airports in the United States, with plans to install 14 EMAS systems at eight additional U.S. airports.

Vehicle/Pedestrian Deviations (VPD) are a significant component of runway safety for Airports. Airports track the rate of VPDs rather than the raw number annually.

A significant number of VPDs appear to be construction-related. Contractor personnel and vehicles, increased airfield activity, and temporary airfield changes create risks for VPDs. Airports continues to work with the Airport Construction Advisory Council to eliminate runway safety risks associated with construction activities. The use of orange airfield signs to identify recent or temporary airfield changes during construction periods is an important initiative that can increase runway safety. The Office of Airports collaborates with the William J. Hughes Technical Center to evaluate the use of these signs at Los Angeles, CA International Airport and expects to publish standards for their use in 2015.

7.1.3 Wildlife Hazard Management Plans

The FAA requires airport sponsors to maintain a safe operating environment which includes conducting Wildlife Hazard Assessments and preparing Wildlife Hazard Management Plans when a wildlife strike has occurred. The Wildlife Hazard Management Plan identifies specific actions the airport will take to mitigate the risk of wildlife strikes on or near the airport. The FAA's wildlife hazard management program has been in place for more than 50 years and focuses on mitigating wildlife hazards through habitat modification, harassment technology, research, and fencing. Wildlife hazards and runway safety integrate closely because wildlife strikes represent a significant risk in the NAS.

Wildlife Hazard mitigation strategies have proven successful in recent years. Professional wildlife hazard programs at nearly every Part 139 commercial service airports are likely responsible for the decline in reported strikes with damage within the airport environment (<500 feet above ground level) from 2000-2011 despite continued increases in populations of many large bird species. A proposed rule that requires mandatory Wildlife Hazard Assessments is currently on hold because of the success of voluntary efforts by airports to complete the assessments and to develop Wildlife Hazard Management Plans. All Part 139 have completed or initiated a Wildlife Hazard Assessment. A key measure for tracking the hazards associated with wildlife is the level of reporting for wildlife strikes at airports. The FAA estimates that 39 percent of all wildlife strikes are currently reported. The FAA has funded an updated study to determine that latest reporting rates based on data from 2010-2013. This study should be completed by the end of fiscal year 2014.

Aside from Wildlife Hazard Management Plans, there are a number of other initiatives that are keeping wildlife hazard awareness at the forefront of airport safety:

- *Wildlife Strike Awareness Posters*
- *Encourages general aviation airports to conduct Wildlife Hazard Assessments*
- *Airport Cooperative Research Program Reports*
- *A publically available National Wildlife Strike Database*
- *Online Wildlife Strike Reporting*
- *Assessment of Avian or Bird Radar Technology*
- *FAA co-sponsorship of the Bird Strike Committee-USA*

The activity undertaken by Airports has contributed to the achievement of Goal 9 of the 2012 Strategic Runway Safety Plan: "Implement program for federally obligated airports to conduct wildlife hazard assessments."[28]

7.1.4 Surface Safety Mobile Application

The Office of Airports is working with the RSG to develop a mobile application that joins critical safety data from the Runway Safety Tracking System (RSTS) and the Certification and Compliance Management Information System (CCMIS) into a single, easy-to-use application. The RSTS provides data obtained through RSAT meetings and CCMIS contributes airport Part 139 compliance inspections, discrepancies, and compliance documents. As a read-only prototype, the mobile application will make available airport data from both data sources. This will allow for FAA safety program managers from ATO and Office of Airports to identify action items and inspection/meeting status for any airport of interest. The application will also compile system metric information for FAA safety executives. Initial development of the prototype should occur early in 2015 followed by a final decision and concurrence from ARP and RSG on deployment.

7.1.5 Automated Foreign Object Debris Detection Systems

The Office of Airports has developed a performance specification that airports can use to competitively procure Foreign Object Debris detection systems. The first detection system on an entire runway was installed at Boston Logan Airport at the end of 2014. Miami and Seattle are also procuring detection systems.

7.2 Air Traffic Services

Air Traffic Services is responsible for the provision of air traffic control services within the terminal and en route domains of the NAS and provides the management and support services necessary to ensure a safe, efficient and effective operation and organization.

Air Traffic Services provides air traffic control operations from 566 service delivery points (23 en route and 543 terminal) in the U.S., Puerto Rico, and Guam; and control more than 59 million square miles of airspace over the continental U.S. and the Atlantic and Pacific Oceans including the South Pacific, to the Northern Polar Routes, the North Atlantic, the Caribbean, and the Gulf of Mexico. These services include airport surface operations that are conducted by Certified Professional Controllers at 515 federal and contract Airport Traffic Control Towers located at airports all across the NAS. These controllers provide the safe and expeditious air traffic control separation services to the thousands of aircraft that land, depart and otherwise move around the airport surfaces. In addition to these aircraft operations, there are many other types of vehicles as well as pedestrians that share these airport surfaces creating an extremely challenging environment, especially at the nation's busiest airports.

Air Traffic Services continues efforts to increase air traffic control safety on the ground and in the air. Air Traffic Services directly supports the runway safety program with several of its business plan targets:

- *Reduce Category A & B (most serious) runway incursions to a rate of no more than .395 per million operations, and maintain or improve through FY2018.*
- *Reduce the risk of runway incursions resulting from errors by pilots, air traffic controllers, pedestrians, vehicle operators, tug operators, and individuals conducting aircraft taxi operations by working in collaboration with aviation stakeholders to identify and mitigate risk.*
- *Improve training, procedures, evaluation, analysis, testing, and certification to reduce the risk of runway incursions resulting from errors by pilots, air traffic controllers, pedestrians, vehicle operators, tug operators, and individuals conducting aircraft taxi operations.*
- *Provide operational support to the Root Cause Analysis Team, as needed.*

[28] The Strategic Runway Safety Plan; U.S. Department of Transportation, Federal Aviation Administration, November 2012. Ch 3, Pg 8 (Goal 9).

7.3 Flight Standards Service

Flight Standards Service initiatives support the Plan's objective to reduce runway incursions, excursions, and other surface events. The initiatives are designed using SMS principles of causal factor and risk analysis in order to enhance development of mitigations through collaboration with ATO, Office of Airports, and the RSG.

Flight Standards collaborates with key safety groups to reach as many pilots as possible with the runway safety message. Given that flight reviews are the FAA's only primary recurrent training opportunity for general aviation pilots, updating the requirements to promote safe airport surface operations topics is under consideration, but would require rulemaking.

In FY2013, Flight Standards Service updated appropriate pilot Practical Test Standards with required testing tasks on runway incursion avoidance during pilot certification.

Pending updates to FAA Order 8900.1 – Flight Standards Information Management System, Flight Standards plans to finalize runway incursion remedial training program and a remedial training syllabus and make it available through FAASafety.gov to assist general aviation pilots in avoiding runway incursions. When finalized, pilots contributing to runway incursions would be required in certain cases to complete mandatory remedial training with either a Designated Pilot Examiner for a Category A or B runway incursion, or a Certified Flight Instructor recommended by the FAA Safety Team (FAAST) for a Category C runway incursion.

Flight Standards has also published a new chapter, Runway Incursion Avoidance in the Pilot's Handbook of Aeronautical Knowledge. Additionally, Flight Standards updated Advisory Circular 120-74B Part 121, 125, and 135 Flightcrew Procedures during Taxi Operations, and Advisory Circular 91-73B Parts 91 and 135 Single Pilot, Flight School Procedures During Taxi Operations, to address aircraft with flight crews, single pilots, and flight school operations of procedures and knowledge needed to avoid runway incursions.

7.4 Near–Term Emerging Runway Safety Technology

The FAA, as part of its continuous effort to improve runway safety in the NAS, will soon commence a demonstration of the Closed Runway Operation Prevention Device (CROP-D) system. CROP-D uses automatic speech recognition technology to help prevent controllers from mistakenly executing aircraft operations on closed runways. Currently, the FAA employs several mechanisms to remind controllers that a runway is closed, including memory joggers such as flight strip holders and placards placed in conspicuous places. These memory joggers are passive and must be manually placed or physically manipulated to be effective, which the controller must remember to do. Another mechanism, such as the Runway Incursion Prevention Device is a memory aid that actively reminds the controller each time the microphone is keyed. Additionally, the Airport Surface Detection Equipment Model X uses surveillance information to alert controllers when an aircraft reaches certain speeds, i.e., 40 knots/80 knots, indicating that an operation other than aircraft taxi is occurring (or is predicted to occur) on a runway designated as closed.

CROP-D scans a controller's clearances using automatic speech recognition. The system will detect any runway information in a clearance, including phrases like, "cleared to land" or "cleared for takeoff." Controllers can also enter closed runway status information into a small user interface. The system will issue an alert if it detects that a controller has given a clearance to use a runway that is designated as closed.

One advantage of CROP-D over the other mechanisms is that it does not require constant monitoring by controllers to be effective. The system only sends alerts when it recognizes that a controller has given a clearance using a closed runway. CROP-D also sends its alerts very quickly after the controller has issued the clearance, which maximizes the amount of time available for the controller to give corrective instructions.

7.5 National FAA University Design Competition

The FAA sponsors an annual design competition for university students. The competition encourages individual students or student teams to develop innovative approaches to solving technical challenges faced by the nation's airports. Students work with faculty advisors and engage industry experts and airport operators to evolve their ideas and gain insight and exposure to aviation-related careers. According to competition guidelines, student design submissions must align with one of four technical challenge areas: airport operations and maintenance, runway safety, airport environmental interactions, and airport management and planning.

Under the auspices of the Airport Cooperative Research Program of the Transportation Research Board the Virginia Space Grant Consortium manages the competition for the FAA. Partnering organizations include the American Association of Airport Executives, the Airport Consultants Council, the Airports Council International – North America,

the National Association of State Aviation Officials, and the University Aviation Association. These partners assist by developing guidelines, providing expert advice for students, disseminating competition information to organizational members, and reviewing student designs/solutions. Promising designs may ultimately receive FAA funding to take their concepts to the next stage of development.

7.6 NextGen

For the past several years, NextGen advances in capabilities and procedures designed for specific airport locations have delivered increased predictability, throughput, and efficiency. The FAA is developing systems and capabilities like Terminal Flight Data Manager (TFDM) and Surface Collaborative Decision Making (SCDM) respectively that share real-time information about the movement of aircraft and vehicles on the airport surface. TFDM and SCDM enable airline ramp towers, flight operators, airport operators, and other air traffic control facilities to collaborate on desired schedules and communicate in real time about the factors that influence the NAS's ability to accommodate the expected increase in the amount of traffic. TFDM also integrates air traffic flight tracking and traffic management tools such as the Traffic Flow Management System and Time Based Flow Management into a single scalable and configurable platform that can be tailored to each facility's unique needs. This enables a facility to more accurately release traffic into overhead flows and meet traffic flow restrictions to, and from constrained airspace and other airports. With these advances, NextGen continues to enhance safety as traffic grows while new types of operations, such as unmanned aircraft systems and commercial space flights, continue to increase. These advances are not only improving safety through enhanced situational awareness for pilots, air traffic control, airline dispatch, and vehicle operators, but are also making gate, taxiway, and runway traffic management more predictable and efficient. However, further reductions in the rate of aircraft accidents and incidents on or near runways remain a top priority for the FAA.

The FAA's NextGen Implementation Plan directly supports the runway safety effort by installing tools and systems that alert air traffic controllers, vehicle operators, and/or flight crews of potential runway incursions. As part of the transition to NextGen, the FAA intends to leverage, to the greatest extent possible, solutions and logistics from infrastructure currently deployed in the NAS. Two of these are Automatic Dependent Surveillance-Broadcast (ADS-B) and Multilateration. Multilateration, for example, is a supplemental surveillance source to Airport Surveillance Radar and Airport Surface Detection Equipment – Model X (ASDE-X) that will eventually replace those systems.

A recent and successful demonstration of these surveillance technologies in a runway incursion prevention role was conducted at Boston Logan Airport and contributed to improved safety on the airport surface. The demonstration equipped airport ground vehicles—such as snowplows, operations vehicles, and emergency vehicles—with ADS-B transceivers so these vehicles could determine their positions from Global Positioning System (GPS) signals. Like aircraft, the ground vehicles appear on tower controllers' displays. Aircraft flight crews, vehicle drivers, airport operators, and anyone else with ADS-B In equipment can track the ground vehicles as well.

These tools and systems are critical to helping the FAA, and early adopters understand current safety accomplishments that positively affect runway safety. NextGen improvements will enhance predictability, efficiency, and safety on the airport surface in the future.

7.6.1 NextGen Implementation Plan

The FAA NextGen Implementation Plan uses portfolios to explain tools and capabilities that apply directly to reducing runway incursions and improving runway safety. These portfolios include Improved Surface Operations with detailed Operational Improvements and capabilities, and air traffic operational domains, such as Push Back, Taxi and Departure and Landing, Taxi and Arrival, described below.

RUNWAY SAFETY BY PORTFOLIO – IMPROVED SURFACE OPERATIONS

This portfolio focuses on improved airport surveillance information, automation to support airport configuration management and runway assignments and enhanced cockpit displays to provide increased situational awareness for pilots, controllers and vehicle operators.

Operational Improvement (OI) 102406: Provide Full Surface Situation Information (FY2016-FY2019)

- *Automated broadcast of aircraft and vehicle position to ground and aircraft sensors/receivers provides a digital display of the airport environment. Aircraft and vehicles are identified and tracked to provide a full comprehensive picture of the surface environment to Air Navigation Service Providers (ANSP), equipped aircraft, and flight operations centers.*
- *Surface situation information will complement visual/observation of the airport surface. Decision support system algorithms will use enhanced target data to support identification and alerting of those aircraft at risk of runway incursion.*
- *In addition, non-ANSP functions, such as airport operations (movement and non-movement areas) and security operations, will benefit from information exchange and situation-*

al awareness of surface position and movement of aircraft and equipped vehicles.

- *Capability Currently Available – Situational Awareness and Alerting of Ground Vehicles*
- *Equipment compatible with airport surface surveillance, e.g., ADS-B Out, will be installed in airport ground vehicles that operate in the movement area. The capability will allow the surface surveillance equipment to display a target representing equipped ground vehicles on air traffic control tower displays and on aircraft cockpit electronic surface maps. The equipment will also be compatible with runway incursion indicating and alerting capabilities, warning controllers of ground vehicles entering an active runway similarly to warnings for intruding aircraft.*

OI 103207: Improved Runway Safety Situational Awareness for Controllers (FY2012-FY2016)

- *At large airports, current controller tools provide surface displays and can alert controllers when aircraft taxi into areas where a runway incursion could result. Additional ground-based capabilities, including expansion of runway surveillance technology, e.g., ASDE-X, to additional airports, will be developed to improve runway safety.*
- *Capability In Development –Expansion of surface surveillance at nine airports using the ASDE-3/Airport Movement Area Safety System for situational awareness and surveillance of the airport surface, and not scheduled to receive ASDE-X, will receive the Airport Surface Surveillance Capability. The system receives input from multilateration system sensors, ADS-B, and Airport Surveillance Radar/ Mode Select terminal radars. This will provide a fused target position of all transponder-equipped aircraft and ADS-B-equipped ground vehicles on the airport surface movement area, as well as aircraft flying within five miles of the airport, for display in the airport control tower. The ASDE-3 primary surface radar will be decommissioned after the capability is installed.*

OI 103208: Improved Runway Safety Situational Awareness for Pilots (FY2012-FY2016)

- *Runway safety operations are improved by providing pilots with improved awareness of their location on the airport surface as well as runway incursion alerting capabilities. Additional enhancements may include cockpit displays of surface traffic, e.g., vehicles and aircraft, and the use of a cockpit display that depicts the runway environment.*
- *Capability In Concept Exploration – Improve Low-Visibility Taxi. The FAA and industry are partnering to develop a taxi benefit for aircraft equipped with certified enhanced vision systems. Currently, Enhanced Flight Vision System-equipped operators can use their systems only for approved situational awareness and safety while on the ground. Some operators have requested that they be authorized taxi benefits when their company's weather minimums are lower than an airport's weather operating minimums and if their aircraft are equipped with the systems. The FAA is evaluating the feasibility of this request in concert with other activities related to improved low-visibility surface operations.*

RUNWAY SAFETY BY AIR TRAFFIC DOMAINS

Push Back, Taxi and Departure: Flight crew situational awareness will be improved by cockpit displays depicting aircraft progress on a moving map as well as the position of other aircraft and vehicles operating on the surface. Flight deck and tower displays are important safety tools that will help prevent runway incursions and other surface conflicts, especially when visibility is low.

Landing, Taxi and Arrival: Before a flight lands, a ground system recommends the best path, based aircraft type, parking assignment, and status and position of all aircraft on the airport surface. The flight crew will also have its assigned runway, preferred taxiway and taxi path to the gate depicted on a cockpit moving map display. As with Pushback, Taxi and Departure, flight deck and controller displays will monitor aircraft movement and provide traffic and incursion alerts. This will reduce the potential for runway incursions.

7.6.2 NextGen and Runway Safety

Reducing the rate of aircraft accidents and incidents on or near runways remains a top priority for the FAA. The RSG will closely monitor key NextGen runway safety development and initiatives to keep pace with the changing safety conditions in the airport environment. The RSG will support the transition to NextGen in the following ways:

- *Act as the interface with the FAA NextGen Program Management Office for runway safety issues.*
- *Review NextGen initiatives relative to runway safety and support SRM activities when requested to ensure that new systems do not adversely impact the airport surface operations environment.*
- *Provide runway safety data and analysis to the FAA implementation community to assist in the development of acquisition business cases with regard to fielding surface safety systems and siting priorities.*
- *Foster a culture of including runway safety data and program goals in technology decisions by actively engaging stakeholders.*
- *Provide periodic updates on airport surface technology initiatives, schedules, and implementation plans to the National Governance Council and RSG management and staff.*
- *Act as the focal point for the FAA Technical Center lab regarding new ATO siting and surface safety initiatives and make schedules available to the Regional Runway Safety Program Manager and other users through the Knowledge Services Network.*
- *Engage in runway safety technological exchanges with international organizations.*

The RSG will also continue to monitor the development of the following listed current and emerging technologies. These technologies will help increase situational awareness for controllers, flight crews, and vehicle operators, and prevent collisions on runways and other movement areas:

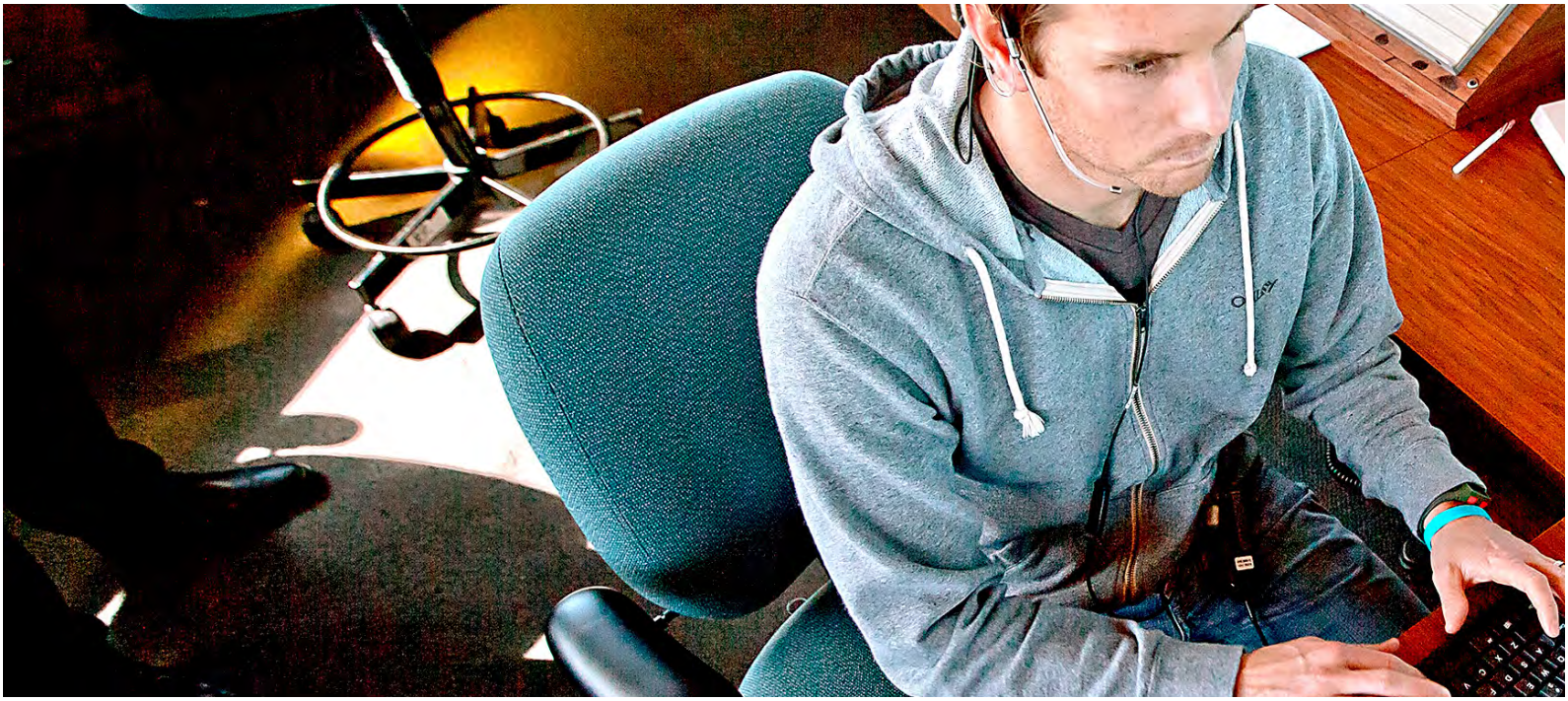
1. ***ASDE-X systems*** *at 35 major airports, which provide detailed information to air traffic controllers regarding aircraft operations on runways and taxiways.*
2. ***Airport Surface Surveillance Capability:*** *This system will bring enhanced surface situational awareness and advanced warning of potential runway incursions to nine U.S. airports for increased safety and efficiency: Anchorage, Andrews Air Force Base, Cincinnati/Northern Kentucky, Cleveland, Kansas City, New Orleans, Pittsburgh, Portland, and San Francisco. The flexible nature of the ASSC system architecture enables future airport surface safety enhancements, such as Runway Status Lights and airport surface movement data distribution to other approved systems and users.*
3. ***Runway Status Lights:*** *Runway Status Lights integrate airport lighting equipment with approach and surface surveillance systems to provide a visual signal to pilots and vehicle operators indicating that it is unsafe to enter, cross, or begin takeoff on a runway.*
4. ***Emerging Technologies:*** *ADS-B and Surface Positioning. Technological advances in Global Positioning System (GPS) sources may ultimately allow aircraft to determine ADS-B position reports with enough accuracy for Airport Surface with Indications and Alerts to work reliably. This technology is still in the early stages of consideration and dependent on multiple external factors before sufficient consideration can be made.*
   a. *Current single-frequency GPS position sources require some form of augmentation to provide the needed accuracy.*
   b. *Dual-frequency GPS position sources, expected to become available around 2018, may be able to provide sufficient accuracy for surface position indicators and alerts.*

Additionally, the RSG is developing tools and methods to increase and improve internal communication and collaboration between lines of business, and better evaluate and score selected surface events:

1. *The Surface Safety Initiatives Team is intended to improve coordination between all stakeholders and to identify and implement technology and procedural solutions that are right-sized, affordable, and mitigate hazards associated with airport surface operations in areas of the highest risk.*
2. *The Surface Risk Analysis Process (S-RAP) tool introduces data-driven scoring methods for event assessment factoring in the effects of proximity, closure rates, barriers and other systemic and non-systemic factors to determine severity, controllability and repeatability of an Runway Incursion event. S-RAP will add other functionalities to accommodate NAS requirements.*

Efforts between the ATO and AFS to integrate the base-lining of airport surface incidents to aid in understanding the upstream causes of conflicts on the surface and the effectiveness of the solutions.

To ensure safety on many of the busier airport surfaces in the NAS, the goal for NextGen includes the further development of integrated risk models that utilizes information sources analyzed through dedicated and interfaced SMS processes. Risk models must allow for differing levels and types of air traffic, varying degrees of airborne and stationary technologies and capabilities, ranges of pilot and air traffic controller proficiencies and performance, changing weather, and environmental and market-driven pressures.



8.0 International Leadership

As the world's economies continue to globalize, so too does the aviation industry. Traffic data reflects that the fastest growing segment of air traffic is international. International pilots are increasingly flying into the U.S. Runway safety operating systems and procedures must harmonize and operate more similarly in order to reduce confusion, which in turn reduces risk.

As the FAA continues to shape and harmonize runway safety performance measures, it is vitally important to interact within the global aviation community to ensure global interoperability. The FAA actively participates in international safety standard and guidance development. Key partners include ICAO, CANSO, the International Air Transport Association, and foreign regulators. The FAA actively promotes international runway safety through the efforts listed below:

- *Member of the ICAO Runway Safety Partnership Program. The FAA works with program partners to develop strategies, initiatives and planning in support of global activities to improve surface safety.*
- *Supports the development and execution of ICAO Runway Safety Go Team methodologies and activities to conduct planning and site visits at the request of airports or States to train and assist organizations in the creation, planning and execution of Runway Safety Teams.*
- *Training agreements and seminars to help international airports comply with ICAO certification and SMS requirements.*
- *Support for the Office of the Secretary of Transportation Safe Skies for Africa Office.*
- *Support for the ICAO Regional Action Safety Groups runway safety initiatives globally through workgroup participation in the Latin America Region and conferences in the Middle East and Asia Pacific Regions.*

- *Participation in the Airport Council International (ACI) Airport Excellence in Safety Program.*
- *Facilitation of CANSO Regional Safety Seminars (at least 3 annually) across the globe focused on risk management and runway safety best practices.*
- *Served as CANSO Safety Program Manager.*
- *Delivery of international presentations of the ATO's Surface Risk Analysis Process developments.*
- *Development of the CANSO Runway Safety Mobile Application, an international mobile application that offers key tips for pilots and air traffic controllers on avoiding unstable approaches that lead to possible runway excursions.*
- *Support international outreach via subject matter expert briefings, working group support, training, and education.*
- *Support the United Nations World Food Program via dissemination of knowledge, information and skill sets at their Aviation Safety Conference.*

9.0 Runway Safety and General Aviation

General aviation is all civil aviation operations other than scheduled air services and non-scheduled air transport operations for paid compensation or hire. General aviation includes such diverse activities as aerial surveying and mapping, law enforcement, crop dusting, and fighting forest fires. The types of aircraft used in general aviation range from single-engine two-passenger planes to business jets to helicopters. General aviation also includes gliders, balloons, and airships.

General aviation accident and incident rates have always been much higher than in commercial flight operations. Compared to commercial aviation, the rate of surface events is disproportionate when comparing the number of flights to the number of hours flown. Among the reasons cited for this disparity is the variety of missions flown by general aviation pilots, the wide range of pilot experience and training, a single pilot's limited cockpit resources and flight support, and less weather-tolerant aircraft.[29]

The FAA's goal of improving runway safety by decreasing the number and severity of runway incursions, excursions, and serious surface incidents includes addressing these differences through several programs and initiatives.

9.1 Voluntary Reporting Program for General Aviation

Recently, the General Aviation Joint Steering Committee launched a prototype program in the Phoenix area which

[29] 22nd Joseph T. Nall Report, Air Safety Institute, p. 45

seeks to use de-identified general aviation operations data, similar to the airline Aviation Safety Action Program and the Air Traffic Safety Action Program to identify risk, pinpoint trends through root cause analysis, and develop safety strategies. The program will work through the Aviation Safety Information Analysis and Sharing program to help identify the risk factors that contribute to serious general aviation events and accidents, including those on the airport surface. Using data generated from this study, the RSG will work with the General Aviation Joint Steering Committee to develop strategies to further improve general aviation's safety performance on the ground.

9.2 Flight Standards Initiatives

- *Flight Review Requirements – As previously mentioned, because flight reviews regulatory requirements are the FAA's only recurrent training opportunity for general aviation pilots, Flight Standards Service will review requirements to promote safety-of-flight and airport surface operations topics in FY2015.*
- *In FY2013, Flight Standards Service updated appropriate pilot Practical Test Standards with required testing on runway incursion avoidance during pilot certification. Flight Standards Service has published a new chapter, Runway Incursion Avoidance, and additional written test questions in the Pilot's Handbook of Aeronautical Knowledge.*
- *Pending updates to FAA Order 8900.1 – Flight Standards Information Management System, include a mandatory runway incursion remedial training program and a remedial training syllabus through FAASafety.gov to assist general aviation pilots in avoiding runway incursions. Pilots responsible for runway incursions would be required to complete the mandatory remedial training with either a Designated Pilot Examiner for a Category A or B runway incursion, or a Certified Flight Instructor recommended by FAAST for Category C runway incursion.*

9.3 Office of Airports Initiatives

For the past three years, the Office of Airports has sent over 9,000 posters each year to every Part 139 and federally obligated airports in the U.S. to encourage wildlife strike reporting. In addition, Airports has sent posters to every flight school, mechanic school, FAA Flight Standards District Office and Certificate Management Office, as well as all state and territory state aviation offices. Airports has also encouraged general aviation airports to conduct Wildlife Hazard Assessments or Wildlife Hazard Site support.

10.0
Conclusion

The safe and expeditious flow of air traffic, vehicles, and pedestrians on the airport surface will always be the product of a complex, disciplined interaction of pilots, air traffic controllers, and operators. The Plan outlines the FAA's blueprint to achieve the FAA's strategic and priority initiatives of making aviation safer and smarter on the nation's runways as complexity continues to increase and NextGen becomes a reality.

In a highly technical and complex system, no one person or group can see or understand the effect of small changes. Safety depends on the ability of the safety risk management processes to identify anomalies buried in terabytes of data to enable possible mitigation or prevention of future events. Data-driven solutions depend on the ability of systems to assimilate the information they contain and communicate actionable information to every segment of the broader community. Analyzing accident and precursor incident data for safety trends, causal factors, and barrier effectiveness informs much of the FAA's research in improved safety metrics, tools and protocols.

For the first time in aviation history, the ability exists to baseline air traffic within any airspace sector or airport surface, utilizing aircraft performance data, radar track data, voice tapes, and subjective reporting by the all the users of the airspace. By using separate nodes of information proactively to prognosticate the patterns and connecting points, strengths and weaknesses of individual components within aviation's multi-dimensional operation can be identified and addressed. Identification of leading indicators and how high risk events come together supports the FAA's transition from an event-based safety system to a data-driven integrated risk-based enterprise.

Safety on the airports surface will rely upon the processing of enormous amounts of data through a more automated self-learning process in order to create better and more relevant analysis of dynamic, static, linear and non-linear interrelationships. This includes the science of predictive analytics, machine learning, and semantic text mining.

The FAA is building upon an already solid foundation of significant and measureable safety improvements to achieve the targets defined in this plan and move from a forensic-based system to a risk-based approach to maintaining and improving safety. The Plan promotes and creates a portfolio approach that collects pertinent safety information, evaluates real-time risk, and enhances knowledge of the effectiveness of current procedures and training for current and planned operations on airport surface environment. It incorporates the principles of the SMS into each of its activities and measurably contributes to maintaining the safest air transportation system in the world.

Appendix A

FY2014 Business Plan Correlations to Runway Safety

BUSINESS PLAN MEASURE/ INITIATIVE/TARGET	DESCRIPTION	COMPLETION DATE	2014 PLAN CORRELATION
14S.3 CORE BUSINESS MEASURE	Runway Excursions		**6.2.1 / 4.3**
14S.3N CORE BUSINESS INITIATIVE	Develop initial guidance to incorporate runway excursions into the FAA ATO Safety and Technical Training		
14S.3N1 CORE ACTIVITY	Develop initial guidance to incorporate runway excursions into the FAA ATO Safety and Technical Training		
AJI TARGET 3	Ensure RE data reports are available for individual tower to review during an RSAT	September 30, 2014	
AJI TARGET 4	Coordinate reliable and consistent data sharing of safety information between Runway Safety and aviation stakeholders	September 30, 2014	**4.3**
14S.80 CORE BUSINESS MEASURE	Reduce Category A & B runway incursions to a rate of no more than .395 per million operations, and maintain or improve through FY2018		
14S.80A CORE BUSINESS INITIATIVE	Reduce the risk of runway incursions by working in collaboration with aviation stakeholders to identify and mitigate risk		**7.1.1 / 7.2**
14S.80A1 CORE ACTIVITY	Human Error Risk Reduction		
AJI TARGET 2	Conduct stakeholder outreach and education of pilots, controllers and airport operators through multiple communications outlets, e.g., multimedia, webinars, mobile apps, short videos	September 30, 2014	**4.5.2/ 6.2.1/ 7.1.4**
AJI TARGET 4	Expand communications efforts to increase stakeholder's awareness of risk associated with airport construction projects and the tools available to mitigate them	September 30, 2014	**4.4.2**

BUSINESS PLAN MEASURE/ INITIATIVE/TARGET	DESCRIPTION	COMPLETION DATE	2014 PLAN CORRELATION
14S.7V CORE BUSINESS INITIATIVE	Safety Programs Group - Collect and disseminate qualitative safety information within and beyond AJI as appropriate		**4.5.2/ 6.2.2**
14S.7V1 CORE ACTIVITY	Collaborate and promote enhancements by creating and delivering resource material and reviewing existing/ projected programs for consistent messaging		
AJI TARGET 3	Communicate AJI programs, priorities, processes and policies through all available media to safety professionals throughout the FAA	September 30, 2014	**2.0 / 4.0**
14S.7V3 CORE ACTIVITY	Collaborate with representatives from NATCA, PASS and other FAA LOBs to create and support local safety councils		
AJI TARGET 1	Improve and maintain the ATC Infohub, the Facility Safety Data Portal and the Partnership for Safety (PFS) external website	July 31. 2014	**4.4.1**
AJI TARGET 2	Promote the value of PFS to all employees within the ATO	September 30, 2014	
14S.3Q CORE BUSINESS INITIATIVE	Promotion of the ACAC		**4.4.2**
14S.3Q1 CORE ACTIVITY	ACAC Policy (ATO)		
AJI TARGET 1	Initiate changes to current ATO policy that require tower facility to coordinate NOTAMs on declared distances runways are shortened	December 31, 2013	
AJI TARGET 2	Support ATO policy implementation that clarifies "relocated" versus "displaced" runway threshold definitions	March 31, 2014	
AJI TARGET 3	Support ATO policy implementation that suspends/cancels instrument procedures on runways that are closed or shortened for more than 60 days	June 30, 2014	
14S.3Q2 CORE ACTIVITY	ACAC Policy (Non-ATO)		
AJI TARGET 1	Support ARP policy implementation that clarifies "relocated" versus "displaced" runway threshold definitions	June 30, 2014	
AJI TARGET 2	Support ARP implementation of "construction orange" coloring on airport signage and surface markings associated with runways and taxiways that have been affected by construction	June 30, 2014	
14S.3Q3 CORE ACTIVITY	ACAC Communications		**4.4.2**

BUSINESS PLAN MEASURE/ INITIATIVE/TARGET	DESCRIPTION	COMPLETION DATE	2014 PLAN CORRELATION
AJI TARGET 1	Share ACAC lessons & best practices with internal/external stakeholders about construction risks and ACAC services and mitigations	March 31. 2014	**4.4.2**
AJI TARGET 2	Exchange airport construction safety information with the international aviation community. Coordinate external links to ACAC documents	September 30, 2014	**4.4.2**
AJI TARGET 3	Support RSAT meetings and creation of plans, procedures, agreements and industry stakeholders	September 30, 2014	**4.4.2**
14S.3Q4 CORE ACTIVITY	ACAC Support to Aeronautical Information Management		
AJI TARGET 1	Support the effective access to available construction information that affects air traffic operations	June 30, 2014	
AJI TARGET 2	Review, approve and support the electronic distribution of Construction Notices	September 30, 2014	
AJI TARGET 3	Support automation of all Construction Notices utilizing data available in the Federal NOTAM System and Airports GIS	September 30, 2014	
14S.7 CORE BUSINESS MEASURE	System Risk Event Rate (SRER)		**4.3.3**
14S.7NN CORE BUSINESS INITIATIVE	(ATO Goal) Advance Safety Initiatives to Enable NextGen Capabilities		
14S.7NN4 CORE ACTIVITY	Establish Safety Roundtable to coordinate and agree on safety strategies to enhance organizational performance, manage risk and achieve prioritization of safety resources		
AJI TARGET 1	Conduct four Safety Roundtable meetings to discuss development and oversee safety strategies which enhance safety performance, manage risk and achieve positive safety results	September 30, 2014	
AJI TARGET 2	Provide interim reports of Safety roundtable meetings quarterly	September 30, 2014	

BUSINESS PLAN MEASURE/ INITIATIVE/TARGET	DESCRIPTION	COMPLETION DATE	2014 PLAN CORRELATION
14S.78 CORE BUSINESS MEASURE			
14S.78C CORE BUSINESS INITIATIVE	Runway Safety Areas – Where practical, upgrade Runway Safety Areas to meet standards		**5.3/ 7.1.2**
14S.78C1 CORE ACTIVITY	Runway Safety Area (RSA) Improvements – Complete all practicable RSA Improvements. ARP will improve 25 RSAs to meet geometric standards, and ATO will improve 75 RSAs to meet RSA standards		**5.3/ 7.1.2**
AAS TARGET 1	Provide RSA completion status report	June 30, 2014	
AAS TARGET 2	Identify RSA improvement projects to be considered for AIP funding in FY2015	August 15, 2014	
AAS TARGET 3	ARP will improve 25 Runway Safety Areas (RSAs) to meet geometric standards	September 30, 2014	**7.1.1**
AAS TARGET 4	ATO will improve 75 RSAs to meet RSA standards	September 30, 2014	**7.1.1**
14S.78C4 THRU C12 CORE ACTIVITIES	Runway Safety Area Improvements in: Alaska Region – 78C4, Central Region – 78C5, Eastern Region – 78C6, Great Lakes Region – 78C7, New England Region – 78C8, Southern Region – 78C9, Southwest Region – 78C10, Western Pacific Region – 78C11, Northwest Mountain Region – 78C12. v Complete all practicable Runway Safety Area Improvements by end of calendar year 2015		
TARGET 1	Update Runway Safety Area improvement completion status data quarterly on 2013-2015 Runway Safety Areas; Due quarterly November 30, 2013, February 31, 2014, May 30, 2014 and August 31, 2014, based on an initial 2014 plan to complete five RSAs in Alaska Region, two RSAs in Central Region, five RSAs in Eastern Region, two RSAs in Great Lakes Region, one RSA in New England Region, one RSA in Southern Region, three RSAs in Southwest Region, six RSAs in Western Pacific Region, and one RSA in the Northwest Mountain Region	September 30, 2014	
TARGET 2	Identify Runway Safety Area improvement projects to be considered for Airport Improvement Program funding in FY2015	September 30, 2014	

BUSINESS PLAN MEASURE/ INITIATIVE/TARGET	DESCRIPTION	COMPLETION DATE	2014 PLAN CORRELATION
14I.7 CORE BUSINESS MEASURE			
14I.7B CORE BUSINESS INITIATIVE	Airports International Program and Policy Outreach Conduct Airports International Program		
14I.7B1 CORE ACTIVITY	KEY STI METRIC: Global Airport Safety – Conduct ARP International Program: Coordinate with OST Safe Skies for Africa Office and develop FY2014 plan for ARP technical assistance to Africa by November 30, 2013; Complete agreement with AGC for ARP participation in ACI Airport Excellence in Safety program by March 30, 2014; and Assist ICAO in conducting 2 Regional Runway Safety Seminars		**8.0**
AAS TARGET 1	Coordinate with OST Safe Skies for Africa Office and develop FY2014 plan for ARP technical assistance to Africa	November 30, 2013	**8.0**
AAS TARGET 2	Complete agreement with AGC for ARP participation in ACI Airport Excellence in Safety program	March 31, 2014	**8.0**
AAS TARGET 3	Assist ICAO in conducting 2 Regional Runway Safety Seminars	September 30, 2014	
14I.8 CORE BUSINESS MEASURE			
14I.8B CORE BUSINESS INITIATIVE	Airports Global Leadership – Improve safety, air traffic efficiency, and environmental sustainability across the globe through an integrated, data-driven approach that shapes global standards and enhances collaboration and harmonization		**8.0**
14I.8B2 CORE ACTIVITY	Improve Global Aviation Safety – Establish international training agreements as required and conduct regional workshops on Airport certification, inspection, safety management systems to increase the number of countries implementing ICAO requirements for certification and SMS at international airports		
AAS TARGET 1	Conduct airport and runway safety training sessions at ICAO Runway Safety Seminar in Malaysia	November 30, 2013	
AAS TARGET 2	Conduct wildlife hazard mitigation regional training seminar in conjunction with ICAO Bangkok	September 30, 2014	
AAS TARGET 3	Conduct one seminar or regional workshop in the Middle East region and one in Africa on implementing ICAO requirements for Airport certification, inspection and safety management systems	September 30, 2014	

Appendix B

2012 Strategic Runway Safety Plan Goals

GOAL	DETAIL
1	Continue the efforts to reduce the severity, number and rate of runway incursions, Losses of Standard Separation, and operational incidents by updating the National Runway Safety Plan initiatives, assigning activities to the responsible FAA Line of Business, identifying ongoing resources, and defining timeframes and success metrics.
2	Evolve runway safety event risk analysis through a surface RAP and adopt target measures compatible with the System Risk Event Rate (SRER) process.
3	Provide integrated risk modeling and surface RAP safety data analysis to the Airport Obstructions Standards Committee in support of the development of airport surface standards for legacy and future generation aerospace vehicles and ground service equipment.
4	Improve runway safety during periods of airport construction by incorporating ACAC activities and data into safety risk management and SMS reporting structures.
5	Consolidate and create accountability for Local and Regional Runway Safety Action Team efforts at the facility/terminal/airport stakeholder group level through the strengthening of the Regional Runway Safety Program.
6	Create and adopt an FAA-wide common taxonomy and classification system to support proactive risk management, global data integration, and advanced surface safety analytical studies within the FAA's SMS.
7	Continue to develop the components of the FAA's operational SMS to identify and manage those hazards and risks which transcend individual regulated entities and overlap multiple sectors.
8	Finalize rulemaking to require certain certificated airports to implement SMS.
9	Implement program for federally obligated airports to conduct wildlife hazard assessments.
10	Further investigate the development of multilateration as a stand-alone airport surface surveillance technology to provide near-term surveillance and identification of all transponder equipped aircraft and vehicle movement on the runway environment.

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http://www.faa.gov/about/plans_reports/performance_profiles/media/serious_runway_incursion_rate_-_FY13_measure_profile.pdf

24. Process for Tracking Runway Safety Performance; U.S. Department of Transportation, Federal Aviation Administration, November 2012.

Appendix D

Organizations Consulted

FAA

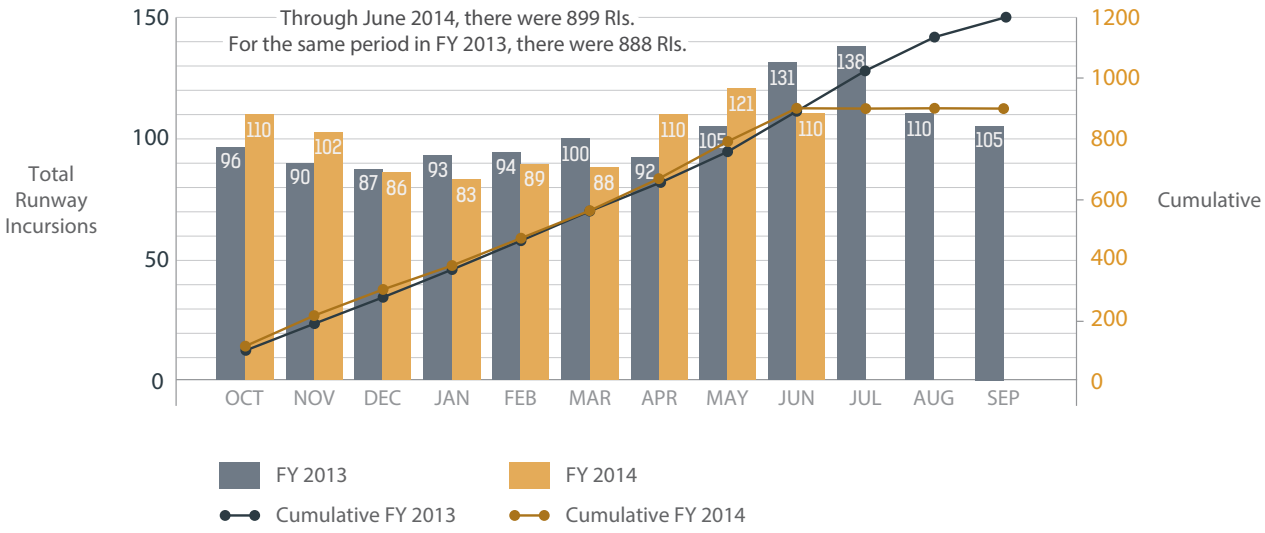
AJI – Office of Safety and Technical Training
AJI -1400 – Runway Safety Group
AJT – ATO Air Traffic Services
AJR – ATO Systems Operations
AJV – ATO Mission Support
AVS – Aviation Safety
AFS – Flight Standards Service
AVP – Accident Investigation and Prevention
AOV – Office of Air Traffic Oversight
ANG – Office of NextGen
AAS – Airports - Aviation Safety and Standards
ARP – Offfice of Airports

Industry and Other Governmental Agencies

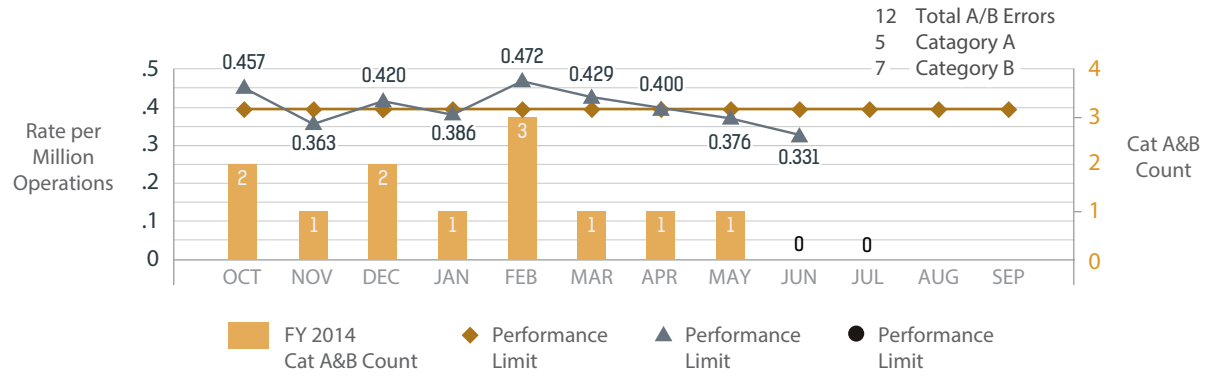
Appendix E

Performance Metrics

Total Runway Incursions, Data as of July 10



Category A&B Runway Incursions, Counts and Rates



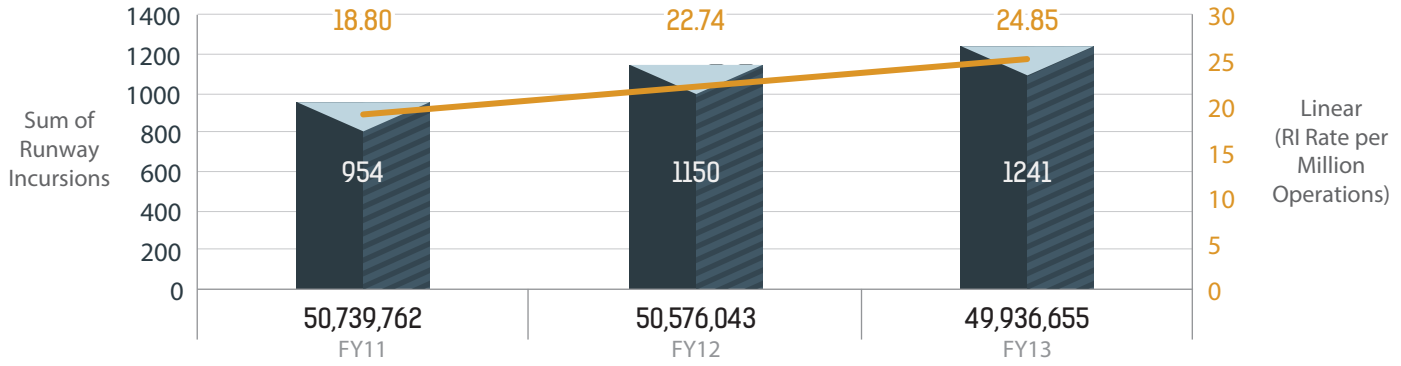
The FY2014 rate contains estimated activity counts. The rate is cumulative from month to month.

Trends

The number of most serious incursions – Category A and B – continued to fall from a total of 67 in FY2000 to just 11 in FY2013. Between FY2008 and FY2010, Category A and B events fell at a rate of 50 percent per year.

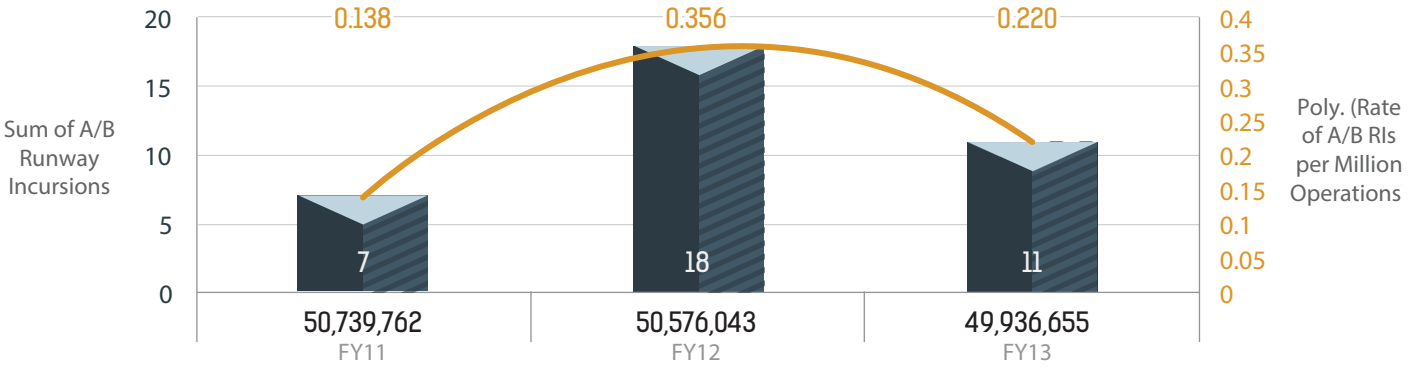
Number and Rate of Runway Incursions

Annual Operations FY2011 – FY2013



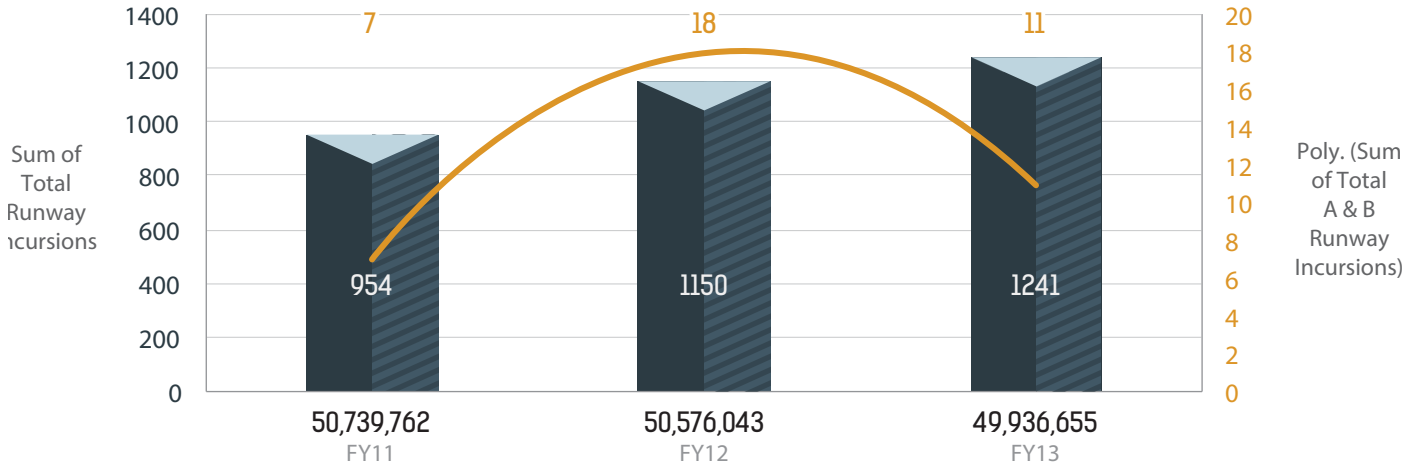
Number and Rate of A and B Runway Incursions

Annual Operations FY2011 – FY2013



Runway Incursions

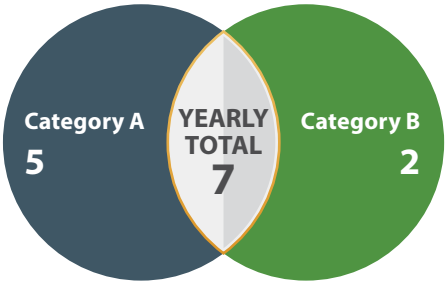
FY2011 – FY2013



Serious Runway Incursions by Fiscal Year

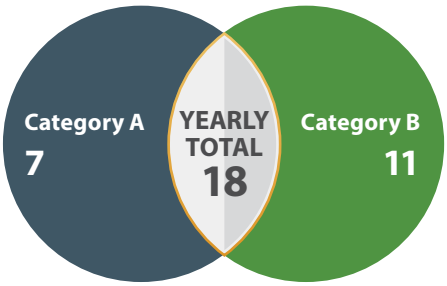
2011

Number

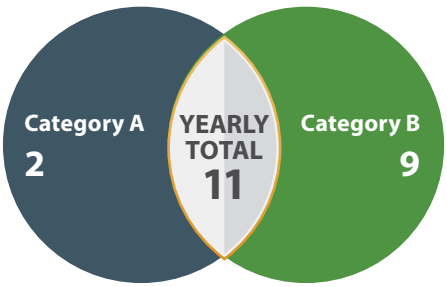


Type

2012



2013



Appendix F

List of Acronyms

AAS	ARP Airport Safety and Standards
ACAC	Airport Construction Advisory Council
ACI	Airport Council International
ACT Taxonomy	Air Traffic Common Taxonomy
ADS-B	Automatic Dependent Surveillance – Broadcast
AFS	Flight Standards Service
ANSP	Air Navigation Service Providers
AOV	Air Traffic Safety Oversight Service
ARP	Airports – FAA Line of Business
AJI	ATO Safety and Technical Training
AJT	ATO Air Traffic Services
AJW	ATO Technical Operations Services
ALPA	Airline Pilots Association
AOPA	Aircraft Owners and Pilots Association
ARP	FAA Office of Airports
ASAP	Aviation Safety Action Program
ASDE-X	Airport Surface Detection Equipment – Model X
ASIAS	Aviation Safety Information Analysis and Sharing
ATC	Air Traffic Control
ATM	Air Traffic Manager
ATO	Air Traffic Organization – FAA Line of Business
AVS	Aviation Safety – FAA Line of Business
CANSO	Civil Air Navigation Services Organization
CARA	Comprehensive Airport Review and Assessment
CAST	Commercial Aviation Safety Team
CCMIS	Certification and Compliance Management Information System
CEDAR	Comprehensive Electronic Data Analysis and Reporting System
CFR	Code of Federal Regulations
CROP-D	Closed Runway Operation Prevention Device
DOD	Department of Defense
DOT	Department of Transportation
EASA	European Aviation Safety Agency
EMAS	Engineered Material Arresting System
FAA	Federal Aviation Administration
FAAST	FAA Safety Team

GAJSC	General Aviation Joint Steering Council
GIS	Geographic Information System
GPS	Global Positioning System
ICAO	International Civil Aviation Organization
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NATCA	National Air Traffic Controllers Association
NAVAID	Navigational Aid
NBAA	National Business Aviation Association
NextGen	Next Generation Air Transportation System
NOTAM	Notice to Airmen
NTSB	National Transportation Safety Board
OI	Operational Improvement
OIG	Office of the Inspector General
PD	Pilot Deviation
PFS	Partnership for Safety
QA/QC	Quality Assurance / Quality Control
RAP	Risk Analysis Program
RIAT	Runway Incursion Assessment Team
RSA	Runway Safety Area
RSAT	Runway Safety Action Team
RSG	Runway Safety Group
RSTS	Runway Safety Tracking System
SCDM	Surface Collaborative Decision Making
SIRAP	Service Integrity RAP
SMS	Safety Management System
S-RAP	Surface Risk Analysis Process
SRER	System Risk Event Rate
SRM	Safety Risk Management
SSR	System Service Review
TFDM	Terminal Flight Data Manager
VPD	Vehicle/Pedestrian Deviation
RCAT	Root Cause Analysis Team
RE	Runway Excursion
RESA	Runway End Safety Area

RI	Runway Incursion
RIAT	Runway Incursion Assessment Team
RRSPM	Regional Runway Safety Program Manager
RSPM	Runway Safety Program Manager
RSA	Runway Safety Area
RSAT	Runway Safety Action Team
RSC	Runway Safety Council
RSG	Runway Safety Group
RSMM	Runway Safety Maturity Model
RSTS	Runway Safety Tracking System
SIRAP	Service Integrity RAP
SMS	Safety Management System
S–RAP	Surface Risk Analysis Process
SRER	System Risk Event Rate
SRM	Safety Risk Management
SSIT	Surface Safety Initiatives Team
SSR	System Service Review
TMR	Traffic Management Review
TRACON	Terminal Radar Approach Control
VPD	Vehicle/Pedestrian Deviation

Appendix G

Glossary

Airport Construction Advisory Council
The Airport Construction Advisory Council is a volunteer group of air traffic managers around the U.S. who help identify potentially dangerous situations during airport construction projects and work with airports, industry and international organizations to implement ways to significantly mitigate accompanying risks.

Airport Surface Detection Equipment, Model X
Surface detection technology that integrates data from various sources, including radars and aircraft transponders to provide controllers a more robust view of airport operations and enable them to detect potential runway conflicts by providing detailed coverage of movement on runways and taxiways. By collecting data from a variety of sources, ASDE-X is able to track vehicles and aircraft on the airport movement area and obtain identification information from aircraft transponders.

Air Traffic Safety Action Program
A voluntary, non-punitive reporting program for employees of the FAA to openly report safety of flight concerns. Air Traffic Safety Action Program (ATSAP) is based upon the principles and mechanisms employed by Aviation Safety Action Program (ASAP).

Aviation Safety Action Program
A voluntary reporting system designed to encourage voluntary reporting of safety issues and events that come to the attention of employees of certain certificate holders. To encourage an employee to voluntarily report safety issues even though they may involve an alleged violation of Title 14 of the Code of Federal Regulations (14 CFR), enforcement-related incentives have been designed into the program. Under ASAP, safety issues are resolved through corrective action rather than through punishment or discipline. An ASAP is based on a safety partnership that includes the FAA and the certificate holder, and usually includes a third party, such as the employee's labor organization.

Aviation Safety Information Analysis and Sharing
The FAA and the aviation community have initiated a safety analysis and data sharing collaboration to proactively analyze broad and extensive data to advance aviation safety. ASIAS leverages internal FAA datasets, airline proprietary safety data, publicly available data, manufacturers' data and other data. ASIAS fuses these data sources in order to proactively identify safety trends and to assess the impact of changes in the aviation operating environment.

Flight Review
A periodic flight review is mandated for pilots by the aviation authorities of many countries. The review takes different forms in different countries.

Certification and Compliance Management Information System
CCMIS is a Web-based application that allows federal airport inspectors to transmit and collect information related to safety and certification inspections of airports regulated under Part 139 of the Federal Aviation Regulations (commercial service airports).

Commercial Aviation Safety Team

Formed in 1998, CAST is a partnership between government and industry including the DOT, FAA, NASA, Transport Canada, European Aviation Safety Agency (EASA), Department of Defense (DOD), Flight Safety Foundation, NATCA, Airline Pilots Association (ALPA), regional, national and international airline associations, and manufacturers. CAST utilizes a data-driven, risk centric, consensus approach to identifying and resolving significant commercial aviation safety issues. CAST achieved its goal of reducing commercial aviation fatality rate by 80% in 2008 and was awarded the prestigious National Aeronautical Association's Collier Trophy in 2008 for "achieving an unprecedented level of safety in U.S. commercial airline operations."

Comprehensive Electronic Data Analysis and Reporting System

CEDAR provides air traffic management with an electronic means of assessing air traffic employee performance, managing resources, and capturing safety-related information and metrics. CEDAR provides a standard interface for collecting, retrieving, and reporting data from multiple sources.

Core 30 Airports

Thirty of the nation's largest airports used to measure air transportation performance data. These airports handle 63 percent of the country's passengers and 68 percent of the country's air freight operations.

Engineered Materials Arresting System

An EMAS uses materials of closely controlled strength and density placed at the end of a runway to stop or greatly slow an aircraft that overruns the runway. The best material found to date is a lightweight, crushable concrete. When an aircraft rolls into an EMAS arrestor bed the tires of the aircraft sink into the lightweight concrete and the aircraft is decelerated by having to roll through the material.

FAA Safety Team

The FAAST mission is to improve the Nation's aviation accident rate by conveying safety principles and practices through training, outreach, and education; while establishing partnerships and encouraging the continual growth of a positive safety culture within the aviation community.

General Aviation

Aviation that is neither government/military nor commercial. GA operations encompass the full range of activity from student pilots to multi-hour, multi-rated pilots flying sophisticated aircraft for business or pleasure. This group of aircraft operations includes small GA aircraft (less than 12,500 lbs. maximum takeoff weight) and large general aviation aircraft (maximum takeoff weight greater than or equal to 12,500 lbs.).

Hot Spot

A location on an aerodrome movement area with a history or potential risk of collision or runway incursion where pilot/vehicle operator heightened attention is necessary.

Mandatory Occurrence Reports

An occurrence involving air traffic services for which the collection of associated safety-related data and conditions is mandatory.

Movement Area

The runways, taxiways and other areas of an airport/heliport which are utilized in taxiing/hover taxiing, air taxiing, takeoff and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with a tower, specific approval for entry onto the movement area must be obtained from ATC.

National Airspace System

The NAS of the United States is one of the most complex aviation systems in the world—consisting of thousands of people, procedures, facilities, and pieces of equipment—that enables safe and expeditious air travel in the United States and over large portions of the world's oceans.

National Transportation Safety Board
An independent U.S. federal agency that investigates every civil aviation accident in the United States and significant accidents in the other modes of transportation, conducts special investigations and safety studies and issues safety recommendations to prevent future accidents.

NextGen Implementation Plan
This plan defines the FAA's path to the Next Generation Air Transportation System. The NextGen Implementation Plan contains firm, fully-funded commitments to new operational capabilities, new airport infrastructure and improvements to safety, security and environmental performance. The plan's management process ensures these will be delivered by a specific near-term dates. The FAA and its partners are also undertaking research, policy and requirements development, and other activities, to assess the feasibility and benefits of additional proposed system changes that could be delivered in the midterm (2012–2018). The goal of this plan is to turn these proposals into commitments, and to guide them into use. The NextGen Implementation Plan was formerly called the Operational Evolution Partnership. Its name has changed to clarify its purpose.

Non-Movement Area
Taxiways and apron (ramp) areas not under the control of air traffic.

Notice to Airmen (NOTAM)
Information on unanticipated or temporary changes to components of or hazards in the NAS provided to aircraft operators until the FAA amends the associated charts and related publications.

Office of the Inspector General
The OIG has a responsibility to report, both to the Secretary of Transportation and to the Congress, program and management problems and recommendations to correct them. The OIG carries out these duties through a nationwide network of audits, investigations, inspections and other mission-related functions performed by OIG components.

Partnership for Safety
PFS, in accordance with FAA JO 7200.21, Partnership for Safety Program, facilitates the identification and mitigation of hazards at the local facility level. PFS is supported by the collaborative efforts of Local Safety Councils comprised of local Union representatives and management at all facilities in the NAS.

Pilot Deviation
An action of a pilot that violates any Federal Aviation Regulation.

Practical Test Standards
Guidelines used by FAA Safety Inspectors or Designated Pilot Examiners to determine the suitability of airmen to be issued an Airman Certificate by conducting a check-ride.

Runway Excursion
A veer-off or overrun off the runway surface.

Runway Incursion
Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.

Runway Incursion Category A
A serious incident in which a collision was narrowly avoided.

Runway Incursion Category B
An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.

Runway Incursion Category C
An incident characterized by ample time and/or distance to avoid a collision.

Runway Incursion Category D
Incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and takeoff of aircraft but with no immediate safety consequences.

Runway Incursion Error Type
Operational incident, pilot deviation, or vehicle/pedestrian deviation. These error types are not necessarily an indication of the cause of the runway incursion, they typically refer to the last event in a chain of pilot, air traffic controller, and/or vehicle operator actions that led to the runway incursion.

Runway Safety Action Team (RSAT)
A RSAT convenes to discuss surface movement issues and concerns at a particular airport and formulate a Runway Safety Action Plan to address those concerns. The team must include personnel from the ATCT and airport operator and may include personnel from various FAA LOBs (including Runway Safety) and interested users of the airport.

Runway Safety Area (RSA)
The FAA requires that commercial airports, regulated under Part 139 safety rules, have a standard RSA where possible. At most commercial airports the RSA is 500 feet wide and extends 1,000 feet beyond each end of the runway. The FAA has this requirement in the event that an aircraft overruns, undershoots or veers off the side of the runway.

Safety Management System
A quality management approach to controlling risk. It also provides the organizational framework to support a sound safety culture. For general aviation operators, an SMS can form the core of the company's safety efforts. For certificated operators, such as airlines, air taxi operators and aviation training organizations, the SMS can also serve as an efficient means of interfacing with FAA certificate oversight offices. The SMS provides the organization's management with a detailed roadmap for monitoring safety-related processes.

Surface Events
Unauthorized or unapproved movement within the designated movement area (excluding runway incursions) or an occurrence in that same area associated with the operation of an aircraft that affects or could affect the safety of flight.

Surface Incident (SI)
Unauthorized or unapproved movement within the designated movement area (excluding runway incursions) or an occurrence in that same area associated with the operation of an aircraft that affects or could affect the safety of flight.

Surface Movement Guidance and Control System
A system used during low visibility conditions providing guidance to, and control or regulation of, all aircraft, ground vehicles and personnel on the movement area of an aerodrome. Guidance relates to facilities information and advice necessary to enable the pilots of aircraft or the drivers of ground vehicles to find their way on the aerodrome and to keep the aircraft or vehicles on the surfaces or within the areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows smooth and freely.

Takeoff Hold Lights (THL)
A component of the Runway Status Lights system that illuminates a string of red lights and serves as an indicator for pilots when the runway is unsafe for takeoff due to traffic on the runway.

Veer–off
A runway excursion in which an aircraft departs the side of a runway.

Vehicle/Pedestrian Deviation (V/PD)
Vehicles or pedestrians entering or moving on the runway movement area without authorization from air traffic control that interferes with aircraft operations.

Appendix H

FAA Strategic Priorities and Priority Initiatives[30]

FAA STRATEGIC PRIORITIES	ADMINISTRATOR PRIORITY INITIATIVES	RELATED SUB-INITIATIVES
Make aviation safer and smarter	**Risk-Based Decision Making** Build on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions	• Improve standardization, data access, and modeling integration • Enhance decision making process • Redefine oversight model for industry
Deliver benefits through technology and infrastructure	**National Airspace System (NAS)** Lay the foundation for the NAS of the future by achieving prioritized NextGen benefits, integrating new user entrants, and delivering more efficient, streamlined services	• Focus to achieve the benefits of NextGen • Integrate new user entrants (unmanned aircraft and commercial space) • Right-size the NAS
Enhance global leadership	**Global Leadership** Improve safety, air traffic efficiency, and environmental sustainability across the globe through an integrated, data-driven approach that shapes global standards, enhances collaboration and harmonization, and better targets FAA resources and efforts	• Transform our internal structure • Develop an integrated, data-driven approach to international activities • Ensure global interoperability of NextGen • Place international resources strategically
Empower and innovate with the FAA's people	**Workforce of the Future** Prepare FAA's human capital for the future by identifying, recruiting, and training a workforce with the leadership, technical, and functional skills to ensure the U.S. has the world's safest and most productive aviation sector	• Leadership Development • Skills Identification • Skills Development • Attracting Talent

[30] http://www.faa.gov/about/plans_reports/media/FAA_Strategic_Initiatives_Summary.pdf

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