



COMMITTED TO CONTINUOUSLY IMPROVING SURFACE SAFETY.

National Runway Safety Plan

2021-2023



**Federal Aviation
Administration**

www.faa.gov

Executive Summary



Aviation lifts our eyes to the sky for the grace of flight, and every successful flight begins and finishes on the surface. That's where we focus our attention for the National Runway Safety Plan 2021-2023.

This strategic plan not only presents the Runway Safety Group's overall framework and mission for the next three years, but also serves as a reaffirmation of our overall commitment to reducing the severity of surface risk and continuously improving runway safety.

The recent incorporation of Aviation Risk Identification and Assessment (ARIA) into the Runway Safety Program will provide safety experts valuable insight for identifying risk, irrespective of compliance. This will enable us to make smarter, risk-based, data-driven decisions.

Insight and good data help move forward Runway Safety's outreach initiatives around proficiency and continuous education, and training controllers, pilots, and vehicle drivers. Allocating importance to outreach at both local and national levels ensures we are well-trained to identify and mitigate risk associated with operations in the movement area of our airports.

As a key stakeholder in the National Airspace System (NAS), Runway Safety shares our best practices and lessons learned by applying our Safety Management principals to a large international audience to improve surface safety worldwide.

The dedication of so many people to the success of the Runway Safety Program at our nation's airports, energizes and strengthens the collective effort and shared responsibilities described in our strategic safety initiatives. The Runway Safety Program is grateful for the ongoing cooperation of Air Traffic Services, Flight Standards Service, the Office of Airports, and Technical Operations.

Together, we are reducing surface risk by identifying and addressing local and systemic issues, thereby enhancing our safety initiatives throughout the NAS.

A stylized, handwritten signature in black ink.

Giovanni Dipierro
ATO Safety and Technical Training
Manager | Runway Safety Group

Table of Contents

- 02 Executive Summary
- 04 Overview
- 06 SMS Components and Runway Safety Initiatives:
 - 1. Safety Policy
 - 2. Safety Promotion
 - 3. Safety Assurance
 - 4. Safety Risk Management
- 18 Runway Safety Technology Roadmap
- 19 Runway Incursion Mitigation (RIM) Program
- 21 International Leadership
- 22 Appendices:
 - A. Surface Safety Group Portfolio of Safety Efforts
 - B. Surface Safety Group Surface Safety Initiatives Team Tracker



Overview

Reducing the risk of runway safety in the National Airspace System is a top priority of the FAA. The National Runway Safety Plan (NRSP) 2021-2023 aligns the strategic priorities of the FAA's Runway Safety Program with the established principles of the Air Traffic Organization (ATO) Safety Management System (SMS). The NRSP 2021-2023 describes how the FAA, airport operators, and aviation industry stakeholders collaborate, using data-driven, risk-based decision making, to enhance safety performance in the surface environment and the NAS. The surface environment includes runway surfaces, taxiway surfaces and the associated protected areas.

The four principles of the ATO SMS, Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion, provide a strong foundation for managing surface safety risk. The Runway Safety Program continues to build upon that foundation, in the evolution from a compliance-based safety assurance methodology to Risk Based Safety Management (RBSM).

The incorporation of the Aviation Risk Identification and Assessment (ARIA) surface module is a further step in RBSM that will change the way we look at risk throughout the NAS. In Runway Safety, ARIA will guide our use of resources to make smarter, risk-based, data-driven decisions. It will influence the way we identify potential safety issues, as well as our activities to reevaluate existing policies and procedures.

This plan also outlines the structure of the Runway Safety Program, from the ATO Safety and Technical Training, Runway Safety Group to the Runway Safety Council (RSC) to external oversight organizations such

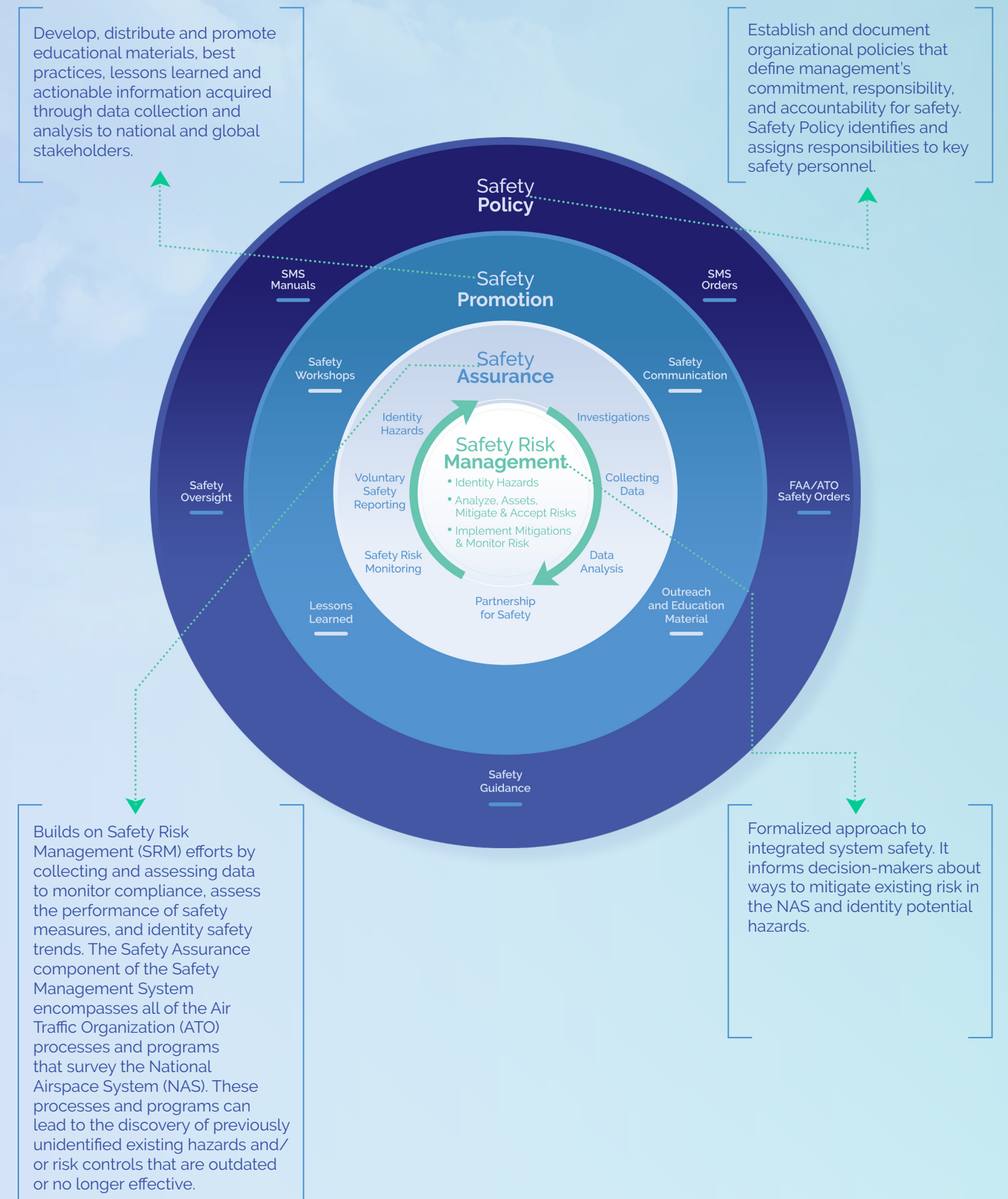
as the National Transportation Safety Board (NTSB), U.S. Government Accountability Office (GAO), and the Department of Transportation (DOT) Office of Inspector General (OIG). These groups work together to identify and mitigate surface risk through the SMS process: data collection and analysis, policy and planning, and communication and education.

The NRSP 2021-2023 sets forth the strategic and tactical initiatives of the Runway Safety Program for the next three years. They include focused activities to enhance existing technology while researching and developing the next generation of surface surveillance technology. In addition to education and outreach to air traffic controllers, pilots, and airfield drivers. Together, all of these will extend the reach of the FAA's Runway Safety Program beyond the NAS, to strengthen runway safety throughout the world.

Supplemental documents and materials can be found on the [FAA Runway Safety Website](#).

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

Figure 1. The Integrated Components of the ATO SMS



Safety Policy

REGULATIONS AND GUIDELINES

Objective: Document and uphold the policies, procedures, and guidelines necessary to ensure an effective, collaborative and adaptable safety culture.

The Runway Safety Program advocates six key elements of an effective safety culture. They are responsibility, accountability, clear expectations, leadership, organizational buy-in, and continuous improvement. These elements harmonize with the principles of the ATO SMS to uphold and strengthen policy and regulations that govern the Runway Safety Program.

The ATO SMS is "an integrated collection of principles, policies, processes, procedures, and programs, used to identify, analyze, assess, manage, and monitor safety risk in the provision of air traffic management and communication, navigation, and surveillance services." The ATO SMS promotes adhering to existing policy and regulation while continuously assessing the need for change.

These practices are applied in our standard of involving stakeholders to define, motivate and guide runway safety throughout the NAS as well as globally. Figure 2 provides an overview of runway safety stakeholders and policy.

How does this work?

Executive leadership from each of the stakeholder organizations collectively form the RSC. In October 2008, then acting FAA Administrator, Robert Sturgell, kicked off the inaugural RSC meeting. The FAA convened the RSC to fundamentally change the existing safety culture

and move toward a systemic pro-active management policy that involved cooperation throughout the FAA, other segments of the federal government and the aviation industry.

Today the RSC is administered by the ATO Safety and Technical Training, Safety Directorate. FAA Order 7050.1 Runway Safety Program defines the RSC as the "primary agent for initiating processes to monitor and address runway safety performance in the NAS." The RSC does this by conducting and/or supporting monitoring activities designed to point to where existing policies and safety measures are effective and where an unacceptable level of risk still exists.

When the RSC determines further action is required, they will assign the activity to the Surface Safety Group (SSG), a cross functional working group comprised of representatives from the RSC member organizations. The SSG will take on the task and bring recommendations for enhancements to existing policy back to the RSC.

To continuously improve the safety of the NAS, the ATO conducts safety audits and assessments to determine whether the NAS is performing as expected. To evaluate how a new element may impact the performance of the NAS, the ATO convenes a Safety Risk Management (SRM) panel. Using the principles of the SMS, the SRM panel conducts a safety hazard analysis to identify any risks that the new element may introduce and the level of the potential hazard. In this way, potential risk can be addressed prior to introducing them into the NAS. When an SRM panel documents a safety requirement related to surface safety, the RSC will assign it to the SSG as appropriate for resolution. [visit for tweaking]

In addition, it is necessary for the Runway Safety Program to take into consideration the recommendations from external government oversight organizations such as the DOT OIG, GAO, and NTSB. When we receive such recommendations, they are added to the SSG Safety Recommendation Portfolio and addressed through that process.

Initiatives:

1. Improve external communication between air traffic managers and airport operators about terminal area incidents by requiring air traffic control managers to share information on terminal area incidents, such as operational incidents and pilot deviations, with airport operators in a timely manner. This will help airport operators identify and implement needed mitigations more quickly. (GAO Audit Report 19-639)
2. Assess existing runway safety program policies, documented in FAA Order 7050.1 Runway Safety Program, to identify where improvements can be made such as reducing ambiguity, emphasizing risk-based safety management versus compliance-only, distinguishing the role of the Runway Safety Council and leveraging the contributions of Runway Safety Action Teams.
3. Provide standardized symbology and verbiage for existing hot spots used for navigating the airport environment. Hot spots offer a visual aid in reducing risk and providing mitigation for confusing areas on the airport surface. There are two types of hot spots: ground movement hot spots and wrong surface hot spots.
4. A hot spot is a runway safety related problem area on an airport presenting increased risk during surface operations. Typically, it is a complex or confusing intersection. The area of increased risk has either a history of, or a potential risk for, runway incursions. Hot spots are indicated on airport diagrams using select symbols. They increase situational awareness by bringing attention to the problem area for pilots, airfield drivers, and air traffic controllers. Implementing standard criteria and processes for designating and eliminating hot spots provides consistency at airports across the NAS.
5. Used in conjunction with the hot spots on airport diagrams, the Arrival Alert Notice adds to a pilot's situational awareness by providing an aerial view of the runway ends of an airport and includes a brief description of the potential reasons causing the runway confusion. This visual graphic is for use during preflight planning and not for navigational purposes.

Milestones:

1. Add a new paragraph to **JO7210.632A, Air Traffic Organization Occurrence Reporting** on requiring timely sharing of surface events with airport operators.
COMPLETED 10/1/20
2. Sign into effect **FAA Order 7050.1 Runway Safety Program** (as amended).
3. Replace existing non-standard hot spot symbols with standard symbols on airport diagrams.
4. Replace current wrong surface arrival symbol to standard cylinder symbol on the airport diagram for the 11 airports with existing designated wrong surface arrival hot spots, in collaboration with the Airport Mapping Aeronautical Charting Group.
5. Develop Arrival Alert Notices for wrong surface arrival hot spots for the 11 airports with existing designated wrong surface arrival hot spots.

Figure 2: Runway Safety Policy

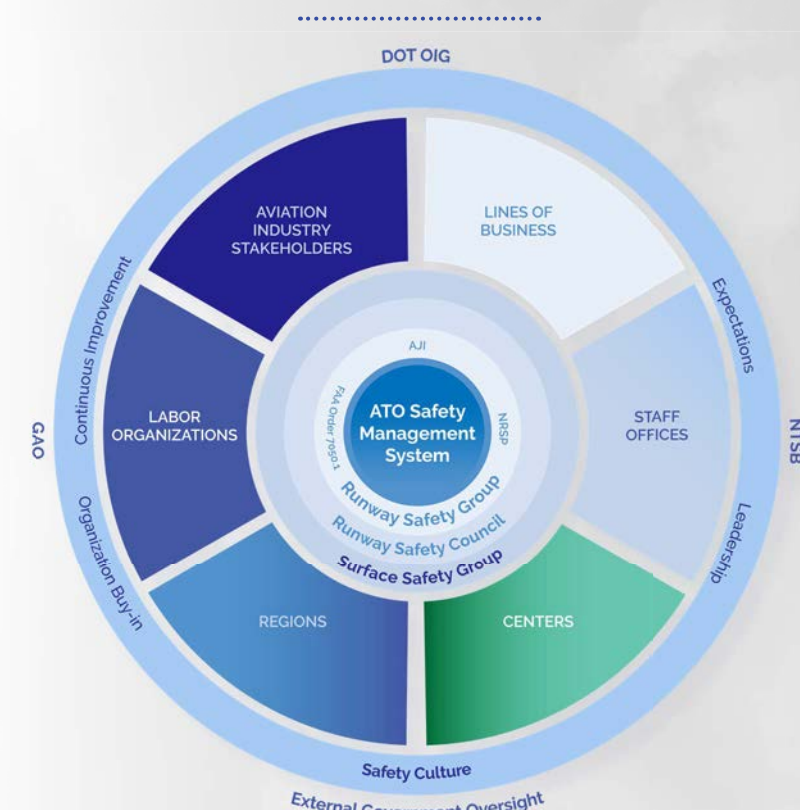


Figure 3. Risk-Based Safety Management

RISK-BASED SAFETY MANAGEMENT (RSBM)

COMPLIANCE-BASED SAFETY ASSURANCE

Approach

Mitigation efforts based on aggregated data that identifies and validates risk in the system

Identification and mitigation efforts based on rule violations in individual events

Comparison

- Addresses compliant and non-compliant operations only
- Confirms current risk, validates suspected risk, and identifies unknown risk across the NAS through tools, such as ARIA, using comprehensive data analysis algorithms
- Focuses on a systemic view of the operation to identify risk before it leads to an event
- Empowers personnel to seek out and mitigate risk
- Categorizes and prioritizes potential risk based on projected severity and probability
- Mitigates potential risk through training, policy, procedure, or equipment changes

- Addresses non-compliant operations only
- Identifies risk through the analysis of non-compliant events
- Focuses on outcomes of non-compliant events
- Involves analysis of past outcomes or events
- Identifies unsafe acts by operational personnel
- Mitigates potential risk through training, policy, procedures, or equipment changes

Safety Risk Management

MITIGATION PLAN DEVELOPMENT AND IMPLEMENTATION

Objective: Continually monitor the level of surface risk in the NAS and assess the need for new and/or revised mitigations.

Ensuring the safety and integrity of the runway environment remains one of the FAA's highest priorities. The Runway Safety Program reinforces this priority through robust safety risk management. The continuing evolution from a compliance-based safety approach to RBSM, enables early recognition of potential areas of risk through data analysis. This predictive capability results in identifying and addressing risk prior to it developing into a dangerous situation.

The FAA risk management strategy includes training, education, and awareness initiatives via structured programs, refresher courses, printed materials, online products, trade, and industry journal articles to maintain runway safety as a top-of-mind priority for pilots, air traffic controllers, and airport personnel. An example of this strategy is the delivery of Special Focus RSAT (SFRSAT) meetings at airports with high rates of wrong surface and runway events, where lines of business work collaboratively with local stakeholders in the development of mitigations and best practices.

Proper airport geometry design and technological initiatives also offer tremendous promise for the improvement of runway safety and include such devices as runway status lights and cockpit moving map displays. Runway Safety aims to implement a plan to assess the effectiveness of all of FAA's terminal area-safety efforts, including Airport Surface Detection Equipment, Model X (ASDE-X) and the Runway Safety Program GAO 19-639 recommendation. For FY21, Runway Safety expects to complete the implementation of ASDE-X Taxiway Arrival Prediction (ATAP) technology at ASDE-X Airports, and at Airport Surface Surveillance Capability (ASSC) airports. Technological initiatives for this fiscal year also include the Runway Incursion Prevention through Situational Awareness (RIPSA) system and a runway excursion mitigation plan.

Additionally, enhancements to air traffic procedures, phraseology and systems provide controllers with better tools to keep aircraft safely separated on runways and taxiways. The ARIA tool's risk-based safety management approach will provide additional insight into the policies and procedures involved in surface safety.

Finally, collaboration with stakeholders is vital in Runway Safety's efforts to effectively reduce surface event risk. This is done by implementing improvements and mitigations in a collective manner throughout the organization through the Surface Safety Group and Runway Safety Action Teams. Regional-level initiatives and mitigations are put forth and tracked in nine Regional Runway Safety Plans.

Regional-level initiatives and mitigations are put forth and tracked in nine Regional Runway Safety Plans.



SSG, RSAT AND RRSP

Surface Safety Group (SSG)

The SSG is a workgroup of subject matter experts from across FAA lines of business and aviation industry. It convenes on a quarterly basis to develop national surface safety strategies and mitigations. SSG members work collaboratively to discuss and review surface safety initiatives established by the group and through the safety risk management process. All initiatives are documented for accountability in the Surface Safety Group (SSG) Portfolio of Safety Recommendations. [Appendix A.]

Runway Safety Action Team (RSAT)

Runway Safety Action Teams bring local airport stakeholders together at least once a year to identify risks to surface safety at that airport and develop plans to mitigate or eliminate those risks. RSATs provide the foundation of the Runway Safety Program at individual airports. The RSAT meetings are the primary forum for pinpointing and addressing airport-specific risk in the surface environment. The product of a RSAT meeting is a Runway Safety Action Plan (RSAP) in which the stakeholders document and agree to pursue specific actions intended to improve surface safety.

Regional Runway Safety Plans (RRSP)

Similar to the NRSP, there is a Regional Runway Safety Plan (RRSP) for each of the nine regions that provides a roadmap with emphasis on regional efforts in support of the NRSP initiatives. RRSP action items are developed locally at quarterly Regional Runway Safety Team (RRST) meetings. These action items are then approved at quarterly Regional Governance Council meetings. Visit the [FAA Runway Safety Website](#) to review the 9 Regional Runway Safety Plans.

- ANE New England
- AEA Eastern
- ASO Southern
- AGL Great Lakes
- ACE Central
- ASW Southwest
- ANM Northwest Mountain
- AWP Western Pacific
- AAL Alaskan

Figure 4: SSG, RSAT and RRSP

What is Aviation Safety?

- CONTROL MEASURES
- ROOT CAUSES
- HUMAN FACTORS
- HAZARD IDENTIFICATION



Figure 5: Risk-Based Safety Management (RBSM)

WHAT IS RBSM?

Risk-based safety management will provide the ATO with greater capability to understand:

1. The effectiveness of safety barriers
2. The safety barriers, under specific conditions, that are most likely to protect from the next accident, serious incident, or safety occurrence
3. The actions necessary to mitigate risk and strengthen safety barriers
4. The effectiveness of mitigations

Why Now?

The reality is compliance alone cannot assure safe operations. We have to look beyond what was done right or wrong to cause individual events, and focus on how we can improve safety across the NAS through the collection of comprehensive risk-based data.

Understanding the risk picture of normal operations within the NAS provides the ATO with an effective means of assuring a risk-based safety management system.

Benefits of RBSM

By equipping and empowering stakeholders to identify and mitigate risk in the NAS through the SMS, things like risk analysis, corrective action plans, and targeted training will improve the ATO's safety performance, making safety everyone's responsibility.

How does ARIA Work?

The Aviation Risk Identification and Assessment (ARIA) airborne algorithm utilizes radar track data and analyzes every encounter where aircraft in flight come within 8.33 nautical miles of each other, regardless of altitude or compliance. Every 2.5 seconds, the system recalculates a value for each encounter based on current proximity, projected closest proximity, and rate of closure. Each encounter is then given a score, based on those components. With this data, safety experts can focus on validated risk, and through a deep-dive barrier analysis review, provide decision-makers the level of that risk, why it exists, its frequency, and its severity. This further facilitates RBSM by enabling safety experts to work with stakeholders to identify the root causes, develop mitigations, and measure their effectiveness. Future modules currently under development include surface and Controlled Flight into Terrain (CFIT). As a tool to be utilized in the transition to RBSM, additional modules will also be developed as need arises.

Benefits of ARIA

- Enables a better understanding of the NAS, the operation, and the potential risk in the operation
- Facilitates the review process by providing a potential risk estimate for all detected aviation risk encounters
- Focuses Quality Assurance processes on those areas of highest potential risk in the NAS
- Applies the same encounter detection algorithm and potential risk assessment standard throughout the entire NAS
- Improves operational agility by focusing safety personnel

Initiatives:

1. Promote runway safety initiatives that leverage enhancing existing technology rather than the cost of full-on development and acquisition.
2. Continue to collaborate across the FAA and other government and industry aviation stakeholders to identify and assess surface safety risk in the NAS. Develop strategies, based on the data, to address the areas where improvement is needed.

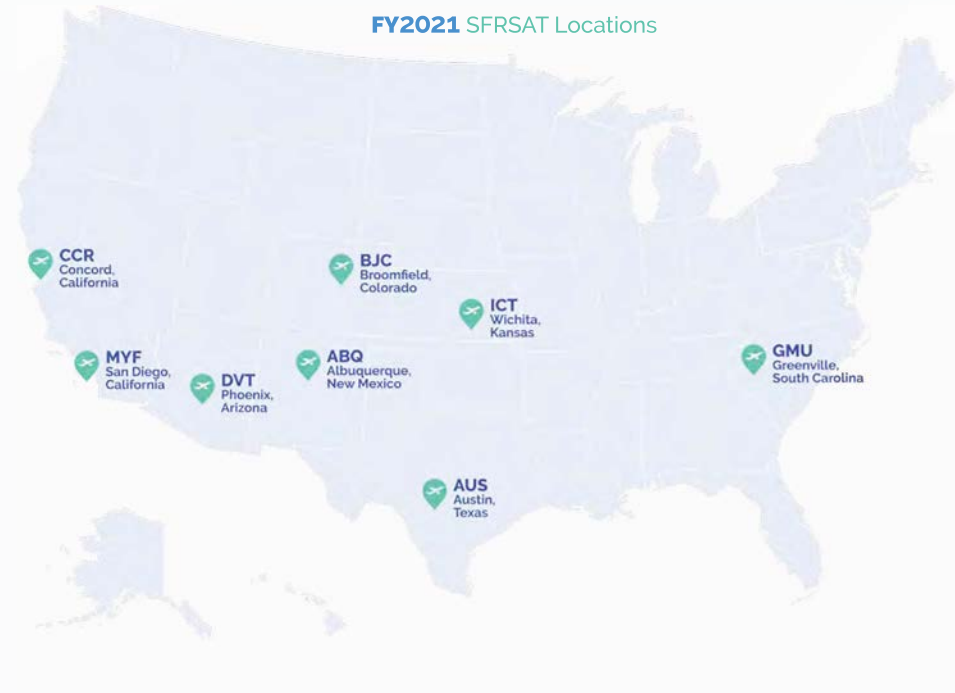


Milestones:

1. Conduct nine Special Focus RSAT (SFRSAT) meetings at specified airports with elevated rates of wrong surface and runway incursions to develop best practices and propose mitigations. Runway Safety will subsequently monitor the effectiveness of the RSAT by tracking runway incursion rates and wrong surface operations. Delivery of the SFRSAT is to be completed in partnership with the Airport District Office, Flight Standards Service, and the FAA Safety Team (FAASTeam). (FY 2021) **COMPLETED 9/2021**
2. Complete implementation of ASDE-X Taxiway Arrival Prediction (ATAP) at ASDE-X Airports.
3. Begin the implementation of ATAP at Airport Surface Surveillance Capability (ASSC) Airports.
4. Runway Excursion mitigation plan **COMPLETED 9/2021**
5. Based on current data analysis, develop and promote outreach and education products to address the risks.

Figure 6: Special Focus Runway Safety Action Team (SFRSAT)

Special Focus Runway Safety Action Team (SFRSAT) meetings drive an engaging discussion on the factors that are contributing to elevated numbers of runway incursions, wrong surface events, or other types of high-risk events at each airport, assess if current local mitigations are adequate, and are a forum to develop recommendations and solutions. Safety professionals from all major airport interests are invited to attend, with presentations from the FAA Runway Safety Group and local teams.



Safety Assurance

Data Collection, Analysis and Assessment

Objective: Apply a data-driven approach to continually evaluate the effectiveness of risk mitigation strategies and controls and pro-actively identify increasing and/or new hazards.

Safety assurance is the means to demonstrate that organizational arrangements and processes for safety achievement are properly applied and continue to achieve their intended objectives. We focus on safety performance monitoring and measuring, managing change and continuous improvement. Safety Assurance has to be dynamic. It cannot be just checking off a box. Historically, the FAA evaluated runway safety by focusing on the number and severity of runway incursions; and while there is benefit in knowing rates and statistics, those numbers do not tell the full story.

The goal is to use data to assess the risk present in the NAS. Determining the impact of Runway Safety Program initiatives depends on complete, reliable data. Taking surface safety to the next level involves identifying underlying systemic risk, and determining if existing barriers are adequate. And, if not, understanding why not. Understanding is key to introducing additional or new barriers to address the risk before it causes an accident or incident. It is important to ensure that the data used in the identification of risk and mitigations are based on accurate data.

Surface Safety Metric (SSM)

The Surface Safety Metric (SSM), implemented in October 2019, goes beyond traditional runway incursion data analysis, focused on the number of events. The SSM was developed to measure the safety performance of the NAS in the surface environment. It incorporates all relevant types of events that can occur in the surface environment including runway collisions, runway incursions, runway excursion accidents, runway excursion incidents, surface collisions and surface incidents. By incorporating every type of runway safety event, the SSM more accurately reflects the overall safety of the surface environment in the NAS.

In addition, the SSM includes more data sources than ever before, such as NTSB data and data from the Aviation System Information Analysis and Sharing (ASIAS) system. As a result, the SSM is able to point to where the risk exists and to quantify the risk objectively;

providing a more accurate picture of the risk present in the NAS.

The RSC promotes applying the SSM across the agency as a critical indicator to determine how surface safety risk is trending and where additional focus is needed. In a joint-venture with the Runway Safety Group, the RSC integrates efforts across the agency, other government stakeholders, and the FAA's industry partners, to monitor and assess the performance of mitigation tools and tactics leading to well-informed, risk-based decision making and management.

Aviation Risk Identification and Assessment (ARIA)

Data collection through the ARIA surface module will provide better insight into potential surface safety risk in the NAS and further the transition from compliance-

“Safety Assurance has to be dynamic. It cannot be just checking off a box.”

based risk management to Risk-Based Safety Management (RBSM). Introduced in 2020, RBSM, will help the ATO zero in on risk and identify safety issues, fix them, and ensure they stay fixed. The roll-out of the ARIA surface module is due for March 2022. See Figure 6.

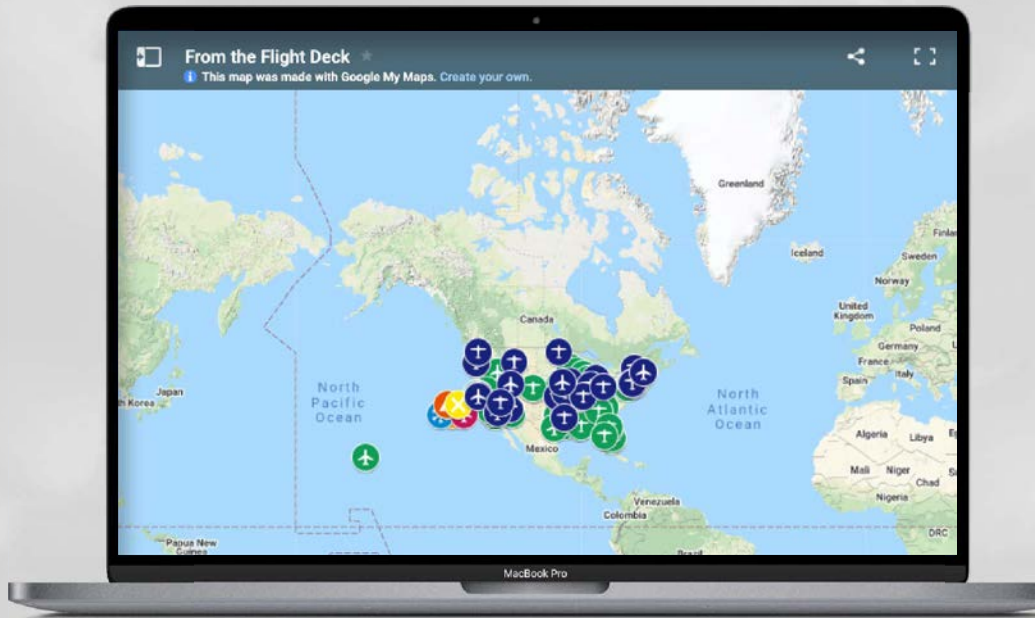


Initiatives:

1. Provide better insight into potential surface safety risk in the NAS in support of the transition from compliance-based to Risk Based Safety Management (RSBM), through the implementation of the Aviation Risk Identification and Assessment (ARIA) surface module.
2. In partnership with the RSC, continue collecting data to monitor and assess existing mitigation efforts relative to the level of risk in the NAS as measured by the SSM. Leverage the RSC quarterly meetings to widely communicate findings and explore recommended solutions.
3. Investigate the trend of wrong direction intersection departures to identify and understand the factors involved. Develop a process to analyze where and under what circumstances wrong direction intersection departures pose a risk. Develop a strategy to mitigate the risk(s) as indicated by the analysis.

Milestones:

1. Roll-out ARIA surface module. (FY 2021)
2. Maintain the weighted Commercial Surface Safety Risk Index at or below 0.35 per million airport operations for commercial aviation. (FY 2021)
3. Maintain the weighted Non-Commercial Surface Safety Risk Index at or below 0.60 per million airport operations for non-commercial aviation. (FY 2021)
4. Recategorize wrong surface events for better accuracy of the violation.
COMPLETED 8/2021
5. Develop a plan to collect data and monitor the impact of the pending new wrong surface arrival standard cylinder shape on the airport diagram of the 11 airports with existing designated wrong surface hot spots .
6. Improve the process to identify and remove duplicate excursion records from the SSM.
COMPLETED 9/2021



Safety Promotion

Outreach and Education

Objective: Continuously communicate, advocate and educate.

A crucial step in runway safety mitigation efforts is for local airport stakeholders to discuss risk and what is being done. Communication connects data analysis to policy and policy to stakeholders, which include pilots, air traffic controllers, and airfield drivers. Enhanced safety requires effective communication to those most affected by surface events. to “Increasing safety requires effective communication between the operators and the users.

The Runway Safety Program works relentlessly to promote changes made nationally to runway safety performance measures. We have also focused strategic communication products to provide local runway information and guidance obtained from data analysis.

One product is the Runway Safety Action Team (RSAT) Web Tool, which Runway Safety is continuously enhancing to ensure that each team meets, or exceeds, the program’s standard requirements. The RSAT Web Tool brings localATC facilities better data to support localRSAT meetings by displaying the approximate location and summary of the runway incursions at each airport. Runway Safety continues to field tools and look for best

practices to assist controllers prevent wrong surface landings and other high risk safety events on and around airports.

Promotional activities and products that examine problems at specific airports have proven to be effective in the promotion of local issues. These products provide broad-level instructional tools to front line audiences such as pilots, controllers, and airfield drivers.

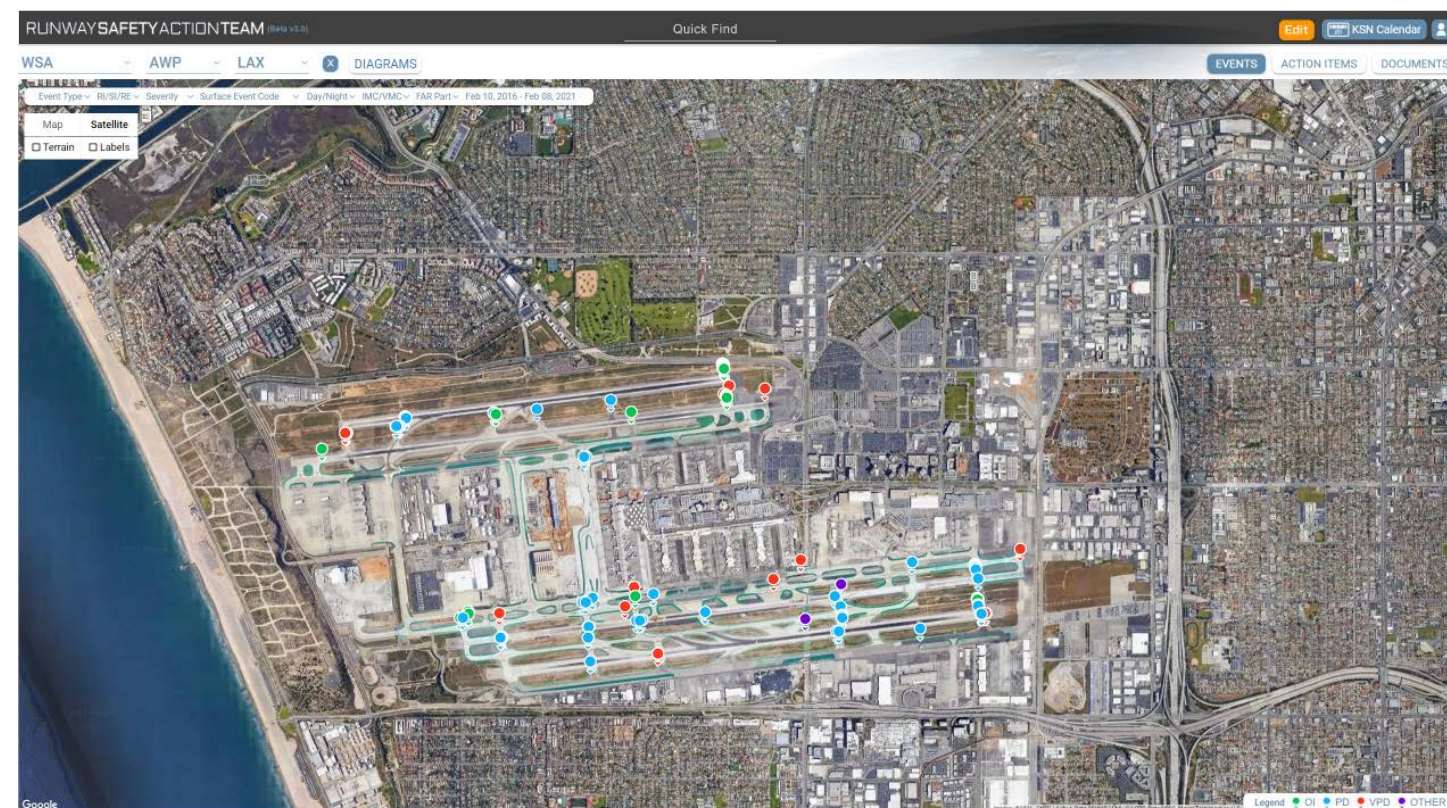
We use multiple outreach methods to reduce risk of surface events. Runway Safety collaborates to create educational products, social media engagement, airport-specific and topic-focused videos, and animations of actual events. Outreach efforts also include participation at in-person events by hosting exhibitions at Communicating for Safety (CFS) and participation at annual air shows, annual stakeholder conferences and conventions, technology symposiums, and virtual forums such as the National Association of Flight Instructors (NAFI) MentorLIVE broadcasts.

Initiatives:

1. Enhance the RSAT Web Tool to ensure each team meets, or exceeds, the RSAT standard requirements.
2. Reduce risk of surface events through outreach and education promoted via social media engagement, video products, and an animation library based on actual events.
3. Conduct outreach to stakeholders through presentations in events such as NAFI MentorLIVE broadcasts.

Milestones:

1. Conduct, at a minimum, one RSAT meeting at each towered airport using the RSAT Web Tool. **COMPLETED**
2. Develop, distribute, and publicly promote 60 airport-specific FAA "From the Flight Deck" series videos. (FY 2022)
3. Develop, distribute, and promote a "From the Flight Deck" single topic video on hot spot standardization.
4. Produce a quarterly animation to be added to the animation library in the Runway Safety Pilot Simulator. (FY 2021)
5. Develop a video series specific to airfield drivers. In collaboration with Tech Ops and Safety Services, PASS, Office of Airports, and AOC. (FY 2021)
6. Collaborate with AOC on a series of airfield driver articles of seasonal or timely relevance, such as winter operations or airport construction.
7. Conduct Hot Spot and Arrival Alert Notice widespread outreach and education through AOC, Agency and Industry partners.
8. Carry out promotion to create awareness among pilots on the addition of Arrival Alert Notices.



Partnering with Flight Standards Service

The Runway Safety Group works closely with Flight Standards and the FAA on improving outreach and promotional efforts through a variety of practices. A recent example of this collaboration is the introduction of the Runway Safety Pilot Simulator as an official FAASTeam WINGS course, a proficiency program that allows pilots to earn credits while improving their aviation skills and knowledge through a number of initiatives.

Runway Safety and the FAASTeam partner together to promote aviation safety through the Safety Program Airmen Notification System (SPANS), FAAST Blast email updates, as well as other methods of mass communication to improve the level of runway safety awareness and enable our surface safety mission. This collaborative relationship continues to grow.



Runway Safety Technology Roadmap

Technology Moving Forward

Over the next years, Runway Safety will focus on implementing technology solutions to specifically target the small to mid-size towered airports that currently have no surface surveillance system. The goal of this “right site-right size” approach is to deploy lower-cost surface safety capabilities intended for smaller airports. This

method creates systems that are affordable in which safety benefits are not outweighed by hefty price tags. In addition, the Runway Safety Group will continue to promote runway safety enhancement initiatives that leverage existing technology, rather than the added cost of full-on development.

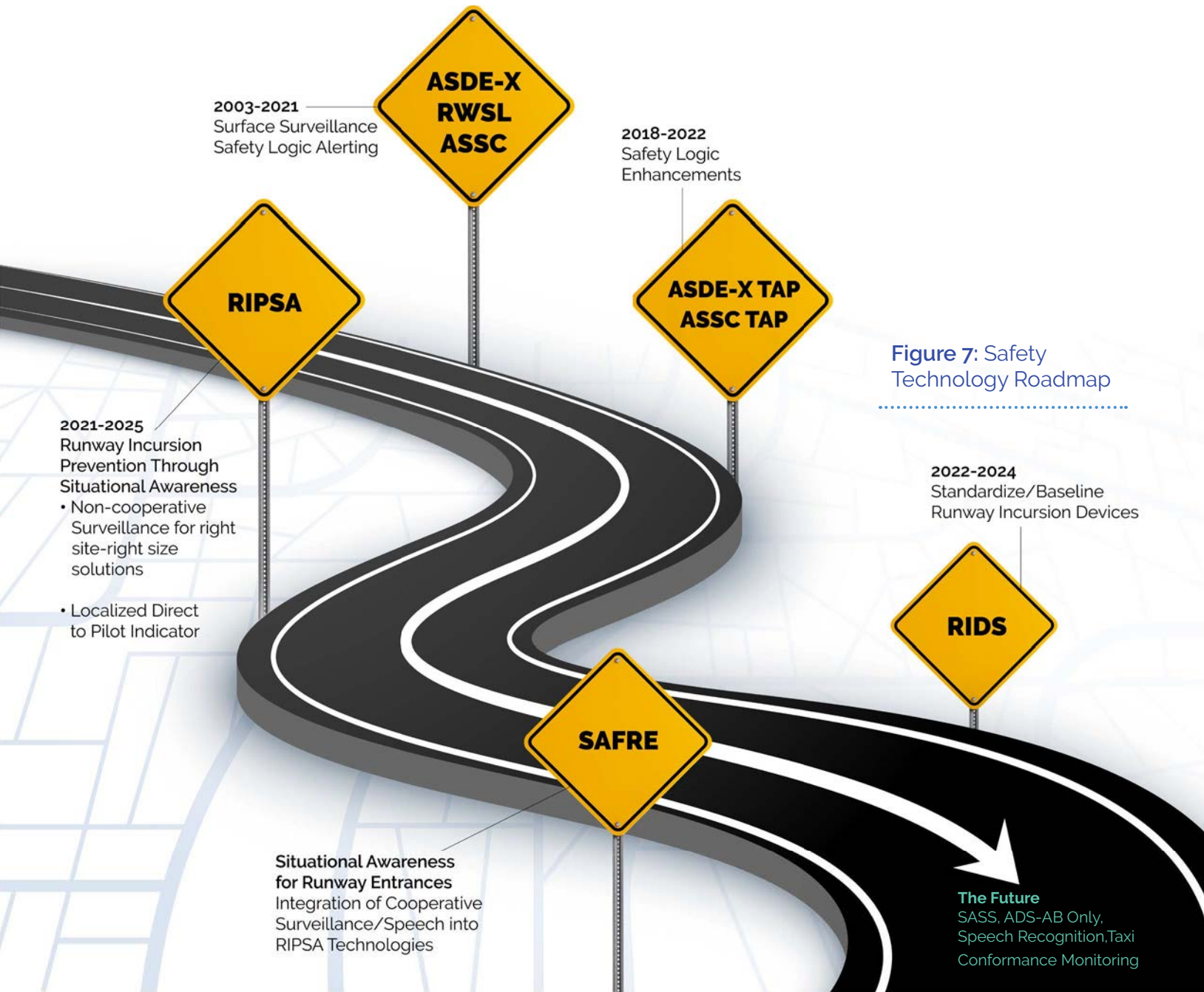


Figure 7: Safety Technology Roadmap

Runway Incursion Mitigation (RIM) Program

This program's management of high-risk areas underscores the FAA's mission to provide the safest, most efficient aerospace system in the world.

The Runway Incursion Mitigation (RIM) program is built on more than ten years' worth of runway incursion data. Over 13,500 runway incursions, and 6,500 non-standard runway/ taxiway intersections at more than 500 airports have been georeferenced and assessed by the FAA and incorporated into a Geographic Information System (GIS) Database that, when applicable, associate incursions with non-standard geometry sites and known hot spots.

The RIM Program made significant progress since launching in 2015. As of May 2021, 67 RIM locations implemented site-specific enhancements including taxiway reconfigurations and changes to lighting, markings, and aircraft operations. Table 1 shows the most recent mitigation projects completed in FY19 and FY21 to-date. Airport planners and designers rely on FAA's RIM mitigation guidance materials and support from FAA Regional program contacts.

The array of completed mitigation projects at U.S. airports illustrate the success of taxiway design element guidance paired with expertise and support from stakeholders. One airport, for instance, had experienced

15 runway incursions between 2008 and 2014 at a RIM location that was also a designated hot spot. With FAA support, that airport addressed geocodes including #6: Two runway thresholds in close proximity and #18: Unexpected holding position marking along a taxiway. After completing the projects necessary to meet current standards, the area's hot spot was removed, and no runway incursions have occurred there since its mitigation. Its configuration before and after are pictured below.

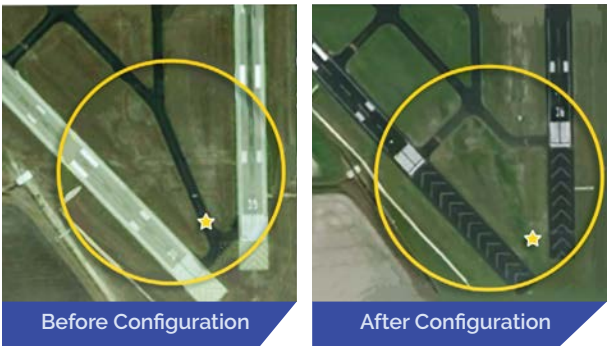


Figure 8: RIM Map



Table: Mitigated RIM Locations

Airport Name	RIM Location Description	Mitigation Type	Date Completed
Long Beach Airport/Daugherty Field, CA	Intersection of TWYs B, D, K & RWs 8L/26R and 12/30	Taxiway/Runway Geometry Reconfiguration	12/29/2020
Cleveland Hopkins International Airport, OH	Five-point intersection of TWYs R, L, A, & RWY 6R/24L	Taxiway/Runway Geometry Reconfiguration	11/2/2020
Des Moines International Airport, IA	Intersection of RWY 13/31 & TWY P	Taxiway/Runway Geometry Reconfiguration	10/30/2020
Merrill Field Airport, AK	RWY 7/25 / TWY C Intersection	Taxiway/Runway Geometry Reconfiguration	10/5/2020
Long Beach Airport, CA	TWYs J & D / RWYs 8R/26L & 12/30 Intersection	Taxiway/Runway Geometry Reconfiguration	9/15/2020
Conroe-North Houston Regional Airport, TX	Intersection of RWY 14/32 & TWY J	Signage, Marking, and/or Lighting	9/14/2020
Reno Tahoe International Airport, NV	RWY 34L Approach End	Taxiway/Runway Geometry Reconfiguration	9/11/20
Flying Cloud Airport, MN	Hold position bar for RWY 10L/28R on TWY C (north of RWY)	Taxiway/Runway Geometry Reconfiguration	8/27/2020
Crystal Airport, MN	TWY E4 between RWY 14R & 14L	Taxiway/Runway Geometry Reconfiguration	8/25/2020
Juneau International Airport, AK	RWY 8/26 / TWY D Intersection	Taxiway/Runway Geometry Reconfiguration	8/5/2020
Phoenix-Mesa-Gateway Airport, AZ	TWY V / TWY B / TWY K / RWY 12R Intersection	Taxiway/Runway Geometry Reconfiguration	7/16/2020
Reno Tahoe International Airport, NV	Intersection of TWY L & RWY 16L/34R & TWY C & RWY 7/25	Taxiway/Runway Geometry Reconfiguration	7/11/2020
Chicago O'Hare International Airport, IL	TWYT / TWY SS / Approach Path RWY 9R	Taxiway/Runway Geometry Reconfiguration	6/1/2020
Hartsfield Jackson Atlanta International Airport, GA	RWY 8R/26L / TWY C, D Intersections	Operational/Procedural	5/29/2020
Hartsfield Jackson Atlanta International Airport, GA	RWY 9L/27R / TWY D Intersection, south side	Operational/Procedural	5/29/2020
Orlando Executive Airport, FL	RWY 7 / TWY E4 Intersection	Taxiway/Runway Geometry Reconfiguration	5/6/2020
DeKalb Peachtree Airport, GA	RWY 3L / TWY A Intersection	Signage, Marking, and/or Lighting	12/31/2019
DeKalb Peachtree Airport, GA	RWY 21R / TWY G Intersection	Signage, Marking, and/or Lighting	12/31/2019
Palo Alto Airport, CA		Signage, Marking, and/or Lighting	12/31/2019
Teterboro Airport, NJ	Intersection of TWY L & RWY 6/24	Taxiway/Runway Geometry Reconfiguration	11/22/2019
Addison Airport, TX	TWY A entrance to Approach End of RWY 15	Operational/Procedural	11/11/2019
Addison Airport, TX	RWY 15/33 / TWY G Intersection	Operational/Procedural	11/11/2019
Addison Airport, TX	RWY 15-33 / TWY C Intersection	Operational/Procedural	11/11/2019
Dallas Love Field Airport, TX	RWY 13/31R / TWY B5 Intersection	Taxiway/Runway Geometry Reconfiguration	10/31/2019
Manchester Airport, NH	Hold short bars on TWYs P & U at intersection with approach end of RWY 35	Taxiway/Runway Geometry Reconfiguration	9/24/2019
Fulton County Airport - Brown Field, GA	Intersection of RWY 8/26 and TWY K	Taxiway/Runway Geometry Reconfiguration	9/1/2019
Miami International Airport, FL	RWY 9/27 / TWYT8 Intersection	Taxiway/Runway Geometry Reconfiguration	8/16/2019
Sarasota/Bradenton International Airport, FL	Intersections of RWYs 4/22, 14/32, & TWYs A, B, C, and D	Taxiway/Runway Geometric Reconfiguration, Signage, Marking, and/or Lighting Change(s), Technological Enhancements	8/8/2019
Smyrna Airport, TN	Convergence of TWYs B, C, & D at the approach end of RWY 19	Signage, Marking, and/or Lighting	5/29/2019
Phoenix Deer Valley Airport, AZ	Hold short bar at intersection of TWY A4 and approach end of RWY 7L	Taxiway/Runway Geometry Reconfiguration	5/7/2019
Bowman Field Airport, KY	Hold bar on TWY J at the intersection with RWY 6/24	Signage, Markings, and/or Lighting	5/1/2019
Van Nuys Airport, CA	Intersection of TWY C/B and approach end of RWY 16L	Signage, Marking, and/or Lighting	3/31/2019
Miami Executive Airport, FL	Hold bar on TWY A at approach end of RWY 9L	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting Change(s)	3/29/2019
Midland International Air and Space Port Airport, TX	Hold bar on TWY A at approach end of RWY 10	Taxiway/Runway Geometry Reconfiguration	1/1/2019
Miami International Airport, FL	Intersection of RWY 8R/26L & TWY M5	Taxiway/Runway Geometry Reconfiguration; Signage, Marking, and/or Lighting	11/16/2018
Orlando Sanford International Airport, FL	Hold short bar on RWY 18/36 south of RWY 9R	Taxiway/Runway Geometry Reconfiguration	10/15/2018
Orlando Sanford International Airport, FL	TWY R under approach path for RWY 9R	Taxiway/Runway Geometry Reconfiguration	10/15/2018
Long Beach Airport (Daugherty Field), CA	TWY R under approach path for RWY 9R	Taxiway/Runway Geometry Reconfiguration	10/15/2018

The RIM Program made significant progress since launching in 2015. As of May 2021, 67 RIM locations implemented site-specific enhancements including taxiway reconfigurations and changes to lighting, markings, and aircraft operations. Table 1 shows the most recent mitigation projects completed in FY19 and FY21 to-date. Airport planners and designers rely on FAA's RIM mitigation guidance materials and support from FAA Regional program contacts.

International Leadership

Runway Safety shares our best practices and lessons learned by applying our Safety Management principals to a large international audience to improve surface safety worldwide.

Through international engagement, FAA increases the safety, efficiency, and environmental sustainability of the global aviation system. The FAA's runway safety strategy aims to reduce surface risk by promoting international connectivity and working with foreign and multinational partners to harmonize procedures and ensure interoperability.

As a global leader in runway safety efforts, the FAA assumes the agency's responsibility with the international aviation community to share safety initiatives and lessons learned to reduce runway safety risk around the world.

Runway Incursion Prevention (RIP) Course

The Runway Incursion Prevention Course delivers RIP training to participants on the identification of contributory factors of runway incursions, standardization of methods in identifying and collecting runway incursion event data, the identification of human factors that affect air traffic controllers and preventative measures to help controllers counteract the adverse effects of human factors in runway safety, among other course objectives.

The RIP course is expected to be delivered to participants in Singapore and in several Central American countries to include Costa Rica, Honduras, and Guatemala. This multi-day course provides a best practice for runway incursion prevention from different airport stakeholders to include airport operator, air navigation service providers, and flight crews.

International Civil Aviation Organization (ICAO) EUR Regional Expert Safety Team (IE-REST)

The IE-REST was created to support the development and implementation of safety enhancement initiatives and activities in the ICAO European region. The FAA has been a participant in this meeting since its inception in 2013.

In a virtual IE-REST forum held in September 2020, the Runway Safety Group conducted a presentation on the Runway Safety Action Team (RSAT) Web Tool and "Wrong Direction Intersection Departures During the COVID-19 Pandemic."

In March 2021, the RSG presented a virtual RSAT Meeting to the IE-REST Member States, highlighting the FAA's runway safety practices, collaborative efforts with various lines of business and industry stakeholders, and just safety culture.

The RSG expects to continue its engagement and sharing of best practices with the ICAO European Region through IE-REST, which has recently changed its name to Regional Expert Safety Group (RESG).

Runway Safety Workshops in the ICAO African Region

In past years, the Runway Safety Group has been actively involved with runway safety workshops in the ICAO African Region. Presently, the RSG is participating in discussions with the FAA AJV-International group and the FAA Senior Representative for Africa and the Sub-Saharan region to present a virtual RSAT Meeting to ICAO African states, highlighting the FAA's runway safety practices, collaborative efforts with various lines of business and industry stakeholders, and just safety culture. There has also been discussion around continuous RSG participation in the further development and presentation of runway safety workshops in the African region.

Appendices:

Appendix A: Surface Safety Group Portfolio of SMS Safety

[Click the link below to review Appendix A]

SSG Portfolio of SMS Safety

Appendix B: Surface Safety Group Surface Safety Initiatives Team Tracker

Initiative	Lead Organization(s) and POC	POC Email Address
Runway Guard Lights (RGL) to increase situational awareness for pilots and vehicle drivers	SSG SSIT: Caroline Gillis	caroline.gillis@dot.gov
Small Airport Surface Surveillance (SASS)	MIT Lincoln Lab/NextGen ANG-C52: Rob Higginbotham	robert.higginbotham@faa.gov
Runway Incursion Prevention through Situational Awareness (RIPSA)	NextGen ANG-C52: John Dutton	john.dutton@faa.gov
Surface Taxi Conformance Monitoring (STCM)	MITRE/NextGen ANG-C52: Phillip Hays	philip.j.hays@faa.gov
ADS-B Vehicle Equipage	PMO Surface Surveillance AJM-421: Bill Kaplan	william.kaplan@faa.gov
ASDE-X Taxiway Arrival Prediction (ATAP) Enhancement	NAS Engineering AJW-148/ATAP Collaborative Work Group: Margit McKee/Bridget Singratanakul	runwaysafety@natca.net (Bridget)
ASSC Taxiway Arrival Prediction Enhancement	AJW-148/Sensis/PMO Surface Surveillance AJM-421: Bill Kaplan	william.kaplan@faa.gov
ASSC with ADS-B Only	PMO Surface Surveillance AJM-421: Bill Kaplan	william.kaplan@faa.gov
Real-time Speech Recognition for Wrong Surface landings	MITRE/Runway Safety Group AJI-141: Scott Proudfoot	scott.r.proudfoot@faa.gov
Applications of Computer Vision in the Runway Environment	MITRE/Runway Safety Group, AJI-140: Giovanni Dipierro	giovanni.dipierro@faa.gov
Standard Certified Runway Incursion Device (RID)	AJW-133: Manny Avila/ SSIT: Steve Pinkerton	steven.pinkerton@faa.gov
STARS Approach Runway Verification (ARV) Enhancement	Terminal Second Level Engineering (TSLE) AJM-2413: Dale Cooley	dale.cooley@faa.gov
Runway Incursion Mitigation (RIM)	Airports AAS-100: Steve Debban	steven.debban@faa.gov
Approach/Departure Signage and Markings	Airports AAs-100: Mike Rottinghaus	mike.rottinghaus@faa.gov
Hot Spot Standardization and Wrong Surface Hot Spots	RSG AJI-140/Airport Mapping, AJV-A242: Christine Madden & Ray German Jr.	christine.madden@faa.gov raymond.german-jr@faa.gov
Surface Surveillance Sustainment Portfolio	PMO Surveillance Broadcast Services: Bill Kaplan	william.kaplan@faa.gov
Runway End Identification Lights (REIL)	Western Service Area Runway Safety: Chris Diggons	chris.diggons@faa.gov

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Runway Incursion Safety Issue SRMD

Surface Safety Group							
Runway Incursion Safety Issue SRMD V1.0 September 6, 2017							
Hazard ID: 16-RI-PD		Assigned to/POC	Baseline Due Date	Adjuste Completion ate	Complete Date	Closing Criteria	Status
1	Assemble a team to review data to determine the best locations to install enhanced lighting direct to operator (e.g., embedded or elevated wig-wag lights or runway hold-short markings) based on the prevalence of hotspots.	DAT and SSIT	8/31/2018	180 days after receipt of survey data (survey data expected January 2022)	1/22/21	Complete the analysis of the effectiveness of the lights and make recommendations.	In progress. 4/21/2021: Survey development is complete; finalizing distribution coordination. Plan to leave survey open for six months. 1/26/2021: The survey questions are still being finalized. However, the distribution and analysis of the surveys isn't included in the current scope of support, requiring additional consideration before proceeding. 10/20/2020: New surveys being developed for drivers and pilots, new plan for distributing. 7/15/2020: Data sample was too small; additional surveys pending. 1/14/2019: Aiport Ops survey of 16 airports complete. Vehicle driver survey complete - only received 12 responses. Consider pushing out again? Pilot survey to be released shortly. 10/30/2019 Completion date revised to 180 days after receipt of survey responses.
1	a. Promote/implement/require RSA enhancers/alerts to emphasize a pilot's entry into the RSA.	Outreach/Promotion	8/31/2018	180 days after Item 1 is complete		TBD	Target completion 180 days after Item 1 is complete.
1	b. Consider opportunities for eliminating the crossing of runways (i.e., end around taxiway).	SSIT	8/31/2018	180 days after Item 1 is complete		TBD	Target completion 180 days after Item 1 is complete.
2	Implement a continual promotional campaign or "information push" for pilots to not cross the hold short line or take off or land without a clearance (e.g., such as SAFO and FAAST Blast). Consider encouraging participation from the industry – airport management, ATC collaboration at airport user meetings, aviation insurance companies, ALPA, and other air carrier union groups (e.g., NBAA).	Outreach/Promotion	8/31/2018	Complete	7/12/2018		Closed FAAST blast released
3	Review corrective actions recommended by 2015 Call to Action and take appropriate action to accomplish.	HQ RSG	8/31/2018	2026-2029 timeframe		All recommendations closed or transferred to the SSG	In progress: all but 2 items are either closed, transferred to SSG or canceled. The two open items are: Human Factors Fatigue Studies related to RIs and Evaluate and Deploy right site/right size technology to mitigate RIs (RIPSA); both long term actions.
4	Encourage all operators to use EFBs with own position.	Outreach/Promotion	8/31/2018	N/A	8/21/2018		Closed FAA Safety Summit August 2018: "Own-ship Position on EFB Applications; " Honeywell, Garmin and Rockwell Collins Technology presentations
4	a. Recommend that the EFB software manufacturers include a tutorial for the pilot to complete prior to unlocking the software functionality.	Outreach/Promotion	8/31/2018	N/A	11/28/2018		Closed Alex Gertsen, NBAA, and Nick DeLotell, Flight Standards Service, researched the industry and FAA training that's available training is adequate. Unlocking to access S/W not feasible.
4	b. Recommend that manufacturers develop their systems to integrated EFB and situational awareness–enhancing technologies system performance-based standards.	Outreach/Promotion	8/31/2018	N/A	11/28/2018		Closed see 4.b.
4	c. Promote situational awareness by the use of integrated technologies (e.g., Pilot-in-the-Loop) in the cockpit.	Outreach/Promotion	8/31/2018	N/A	11/28/2018		Closed: FAASTeam alone is doing training courses and seminars, on avg every 6 days, where training is EFB based. On-going activity
5	Schedule a Runway Safety Action Team in conjunction with pilot/controller forums.	Outreach/Promotion	8/31/2018	N/A	7/12/2018		Closed On-going activity
6	Use pilot seminars to educate pilots on the four identified causes of pilot–deviation related RI issues. (e.g., EAA, AOPA, FAAST [address both GA and Air Carrier training, re-emphasize Runway Safety ACs 120 74, 91-73, and SAFOs 13007, Using Runways As Taxiways, and 11004, Runway Incursion Prevention Actions	Outreach/Promotion	8/31/2018	N/A	7/12/2018		Closed On going activity
7	Enhance performance of the RSAT through communication and the transfer of information between airport management, Air Traffic, and pilots at towered airport facilities (e.g., recurrent meetings with tenants to discuss RI issues.) (1 + years)	Outreach/Promotion	8/31/2018	N/A	7/12/2018		Closed On going activity
Hazard ID: 16-RI-OI							
8	Use the Take a Stand for Safety campaign to raise awareness and address runway safety issues (e.g., RIs, runway flyovers, expectation bias).	Outreach/Promotion	8/31/2018	N/A	7/12/2018		Closed On-going activity
9	Emphasize the use of the Memory Aids Tool Box and continuously improve the resource within a facility (implemented in 2016); create an Air Traffic Procedures Bulletin item emphasizing the need for memory aids, etc.	Outreach/Promotion	8/31/2018	N/A	4/12/2018		Closed On going activity
10	Utilize peer groups at facilities to emphasize runway safety Best Practices and develop a database for storing Lessons Learned and opportunities for further training.	Outreach/Promotion	8/31/2018	N/A	7/12/2018		Closed On-going activity
11	Utilize the Human Performance Team's study of controller runway scanning techniques for development of: a. Initial training for runway scanning techniques. b. Recurrent training for runway scanning techniques, incorporating the findings of the Human Factors study. Human Performance is providing research results to inform training and through the grant with the University of Oklahoma (OU), provide and test a prototype training tool (and suggestions for how to use it). – Target to have recommendations for tower controller scan pattern training complete 3/31/2021 – Target to deliver enroute scanning tool prototype 8/31/21 – Target to complete evaluation report 12/31/21 – Target to complete similar tool for tower scanning - 6/30/23	Human Performance AJI-2	8/31/2018	a. 11/31/2021 b. 11/31/2022			In progress: 4/21/2021: Waiting for update. 1/26/2021: Next target date 3/31/21. 10/20/2020: Progress continues, target dates pushed out 3 months (see Initiative description). 7/15/20: Jerry Crutchfield briefed the RSC in April. Research study is continuing. Next steps is working with subject matter experts leading to determining which patterns to teach to novices. 2/12/20: Jerry Crutchfield, AAM-520, will provide an update at RSC #46 . Data has been collected from 3 towers (MCO, DEN, APA). Data to be collected from a 4th tower (MSP) in September. There's funding and an agreement in place to continue working with Dr. Kang (OU), but the work is delayed until December
12	Continue development of system that indicates the occupied runway status such as the Small Airport Surveillance Sensor (SASS). (5+ years)	SSIT	FY2023	N/A		Tech transfer	In progress 4/21/2021: Industry Day held 2/4/2021, Six vendors sent a Letter of Interest to the FAA FAA and MIT LL, ATO is developing an Operational Needs Assessment. 1/26/2021: SAAS Industry Day will be held February 4, 2021. 10/20/2020: Industry Day pushed out from July to December 10, 2020. 7/15/2020: On track. Target tech transfer complete by end of CY 2023; monitor industry development; target FAA OT&E as part of SAFRE 2024 2028 timeframe.
Hazard ID: 16-RI-VPD							
13	Update the educational/training videos that are currently outdated and disseminate to all airports (both Part 139 and non–Part 139).	Ramone Crowe	8/31/2018	3/1/2020			In progress. 4/21/2021: Ted Greenfield, AJI, has the ability to put the eLMS airfield driver course in a format that can easily be shared ; Ramone will coordinate with Ted. 1/27/21: Ramone Crowe, AJW-137, is assembling a small group to address this. More information will be available at the April SSG meeting. In the meantime the analysis is not yet complete. 10/10/2020: Effort in progress to determine the gaps in the existing training. The driving training videos will be updated once this is complete. Expect data analysis to be complete by the January SSG meeting. 7/15/2020: Under
14	Merged with 7						
15	Utilize peer groups at facilities to emphasize runway safety Best Practices and develop a database for storing Lessons Learned and opportunities for further training. C	Outreach/Promotion	8/31/2018	8/31/2018		Published Information that emphasizes performance based training.	Closed Airport AC 150-5210.20A Paragragh 2.2 Driver training requirements FAA uses forums such as annual regional conferences where non PART 139 airports participate to reemphsize application of the program. Instead of creating a stand alone database for lessons learned and opportunities for further training will be included in the
16	Research the use of onboard-surveillance technologies for vehicle operators to enhance situational awareness. Add in: 2015 Call to Action Visual Recommendation #3 "Conveying Taxi Instructions" transitioned to the SSG Description: Convey audible taxi instructions/alerts electronically using available technology such as GPS in cockpit Open outcome: Research and develop technologies, databases and algorithms that support taxi conformance monitoring efforts.	SSIT and Outreach/Promotion	8/31/2018	FY2022/2023		Demonstrate prototype and conduct feasibility analysis.	In progress 4/21/2021: Continue development and refinement of cockpit-based prototype through field testing; assess, options to communicate with tower-based prototype, continue development and conduct HITL tests of tower-based prototype for taxi conformance monitoring system, focused on tower facilities with high amounts of general aviation traffic. 1/26/2021: Development of the tower-based prototype continues. 10/20/2020: Human In The Loop (HITL) simulations on-going. 7/15/2020: On track. Leveraging on-going Surface Taxi Conformance Monitoring research by the MITRE

2015 Call to Action Recommendations

2015 Call to Action Recommendations					
Developed during the MM DD, 2015 Administrator's Call to Action meeting to address runway safety.					
		Visual Recommendations		In progress:	Runway Incursion Prevention through Situational Awareness (RIPSA) is an initiative of NextGen’s RIRP, employing a “right site/right size approach to address runway safety.”
Initiative	Description	Assigned to	Baseline Target Date	Status	
6. Technology Expansion and Utilization	Determine where technology expansion would be most beneficial using a “right site/right size” approach for candidate airports in order to decrease runway incursions.	NextGen	9/30/2018		not a duplicate of recommendation Visual # 3 (Conveying Taxi Instructions) as suggested by the DOT OIG. Visual Recommendation # 3 specifically addresses taxi instruction discrepancies, confusion and miscommunication. Visual Recommendation #6 involves developing prototypes of potentially lower cost technologies to test and evaluate at small to medium-sized airports throughout the National Airspace System (NAS).
1. Communications	Using available and newly conducted research, conduct human factors studies on the extent that human factors and fatigue impact runway safety events for controllers and pilots.	Human Performance	9/28/2018		These emerging technologies address surface surveillance and operator annunciation concepts to reduce the risk of runway incursions at airports without existing ground surveillance and safety systems such as Airport Movement Area Safety System (AMASS), Airport Surface Detection Equipment-Model X (ASDE-X), Airport Surface Surveillance Capability (ASCC) and Runway Status Lights (RWSL). In progress: We have the results of the first part of a study which was a literature review. Piloting further study on fatigue that can result in something actionable has been problematic. The FAA is evaluating a number of potential technologies and planning to install prototypes at three candidate airports for Operational Test and Evaluation around FY2020-2021. The target date for technology transfer to the Acquisition Management system is FY2022. Deployment would begin approximately one year later. Adjusted TOD: FY2023 The FAA’s Human Performance Team is participating in a number of research initiatives. The Surface Safety Group (SSG) plans to leverage these efforts and to link fatigue into the assessments. By coordinating these efforts we can achieve a full investigation of runway safety events, from every perspective, in order to develop and implement meaningful mitigation plans. The SSG will monitor and report the progress of this effort as part its Surface Safety Initiatives Work plan.
				Adjusted TOD: 9/30/2020	
				Recommended Complete	to OIG in May 31, 2019 response to OIG Report No. AV2018058 light F Standards Board selected multiple evaluations in multiple settings and documented the following conclusion in FAA Aviation Safety Memorandum for the Record dated October 23, 2018-
2. General Aviation Pilots – Periodic Training on Signs and Markings/ Surface Situational Awareness	Explore amending Federal regulations to require runway safety training matrixes. Develop an awareness campaign aimed at certified flight instructors to use and review an advisor circular an other FAA documents regarding runway safety elements. Conduct remedial training for runway incursions.	Flight Standards	9/30/2017	Complete	October 2015 acknowledged as complete. IG has C
3. Part 1: Conveying Taxi Instructions Part 1: Conduct shortfall analysis Due: September 30, 2017 Complete: November 2016	Convey audible taxi instructions/alerts electronically using available technology such as GPS in the cockpit.	NextGen	9/30/2019		2017, the FAA has completed the development of the construction graphics. However, the FAA is still unable to implement them until the issues with the NOTAM platform manager are resolved. Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058 The FAA’s Research and Development Office is overseeing a complete refurbishment of the NOTAM platform manager; but there have been delays.
4. Outreach and Education	Using surface event data available to the Runway Safety Group, collaboratively develop Expanded Briefed Instructions graphic NOTAMS for the pilot community.	Runway Safety Group	8/30/2017		The SSG has added monitoring the progress of this effort to its Surface Safety Initiatives Work Plan. The SSG meets quarterly to update the work plan. The FAA proposes closing out this recommendation with the transfer of the initiative to the SSG. OIG has acknowledged as complete. Complete: June 2017
5. Research/Data Analysis/Post Event Communication With General Aviation Community	Provide a recurring forum to collaboratively share lessons learned with the general aviation community.	Communications			Canceled
Initiative	Description	Assigned to	Due date	Status	
1. Airport Awareness for Pilots and Vehicle Drivers	Develop guidance and awareness for pilots and vehicle drivers when unfamiliar with an airport.		9/30/2018	Complete	OIG has acknowledged as complete.
2. Enhance Operator/Controller Relationships	Schedule familiarization sessions between operators and controllers at Core 30 airports and regional and towered airports.			Canceled	
3. Airport Communications	Convene an annual Government/industry working group that examines best practices for communicating on airport surface/movement areas. Best practices will be formalized and associated training and familiarization efforts will be implemented.		11/1/2016	Complete 6/23/2016	IG has O acknowledged as complete.
Procedures and Awareness					
Initiative	Description	Assigned to	Due date	Status	
1. Implement Closed Runway Operation Prevention Device (CROPD) Voice Recognition Technology	Reduce takeoffs and landings on one runway. Implement one CROPD per service area. Track each instance of CROPD alerts.		9/30/2017	Complete 8/2017	IG has acknowledged as complete.
2. Develop CROPD Technology	Implement CROPD voice recognition version and continue to develop the CROPD technology by implementing additional requirements.		9/30/2017		Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058 y B validating the CROPD concept, the FAA has recognized the value of voice recognition technology beyond CROPD. While voice recognition for closed runway is moving through the acquisition system, the FAA is researching implementing speech recognition capabilities for En Route, Terminal Radar Approach Control and Air Traffic Control Towers (ATCTs). Although these capabilities are years away, the FAA is doing much more with speech recognition than was originally envisioned. In the interim, the SSG is monitoring the effort as part of its Surface Safety Initiatives Work Plan. The SSG meets quarterly to update the work plan. The FAA proposes closing out this recommendation with the transfer of the initiative to the SSG.
3. Advanced Electronic Flight Strips (AEFS)	Evaluate National Airspace System (NAS)-wide implementation of flight strips. FAA installed this technology at the Cleveland Air Traffic Control Tower in September 2015.		9/30/2017		Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058 The evaluation at Cleveland ATCT did not result in enough data to conduct meaningful analysis. Electronic Flight Strips will be deployed along with Terminal Flight Data Manager (TFDM). At that time they will be examined through the FAA’s Safety Management Process. This will occur around FY2023 (approximately half way through the TFDM waterfall).
4. Aural Awareness for General Aviation and Ground Vehicle Operators (Maintenance Technicians, Tarmac Personnel)	Increase awareness of general aviation pilots to state to air traffic control that they are “unfamiliar” with the airport and to request “progressive” taxi instructions.		9/30/2016		OIG has acknowledged as complete.
5. Airport Geometry Issues	Improve construction planning and geometry by developing procedures to avoid direct access/entrances to runways; identifying procedural gaps, geometry problems, and general issues; and improving runway construction NOTAMs and the corresponding data to address current procedural shortfalls.		9/30/2016		The Office of Airport Engineers implemented design standards from Advisory Circular 150/5300-13A to prevent direct access to a runway from an apron or ramp area. heIntended outcome to “include diagrams for all airports in the NOTAM database” is a duplicate of Visual Recommendation #8, Intended Outcome #5. Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058
6. Frequency Procedures	Review common protocols for dual frequency concerning military aircraft.		7/31/2016	Complete	OIG has acknowledged as complete.
7. Air Traffic Control Memory Aids	Establish a requirement to review memory aid efficacy on an annual basis. Memory aids are visual instruments that assist controllers in performing their duties.		7/2/2018		Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058 In November 2017 the OIG noted “This initiative was started prior to the 2015 Call to Action. The six tower operations have been selected for the study to measure the effectiveness of memory aids at the towers. The study is ongoing.” The FAA offers this clarification to the preceding statement. The phrase “six tower operations” does not refer to six airport towers, but rather to six operations in the air traffic control tool box that require the use of memory aids. Each local air traffic control team is the only one with the ability to review the effect of their memory aids across those six operations. Memory aids are included in facility Standard Operating Procedures that are required to be reviewed annually.
8. Pilot Memory Aids	Evaluate memory aids for pilots. Also, mandate at least one or two pilots to be “heads up” during taxi train/practice for “recovery in unusual situations.”		9/30/2016	Complete	OIG has acknowledged as complete.
9. Taxi Instructions	A workgroup will be put together to evaluate taxi instructions and related phraseology.		9/30/2016	Complete	IG has acknowledged as complete.
10. Hold Short Taxi Instructions	Evaluate the use of NextGen technologies, such as DataComm and Taxi Conformance Monitoring, when issuing taxi instructions.		2023-2027 time frame adjusted to 2026-2029 time frame		Recommended Complete to OIG in May 31, 2019 response to OIG Report No. AV2018058 Although it is several years in the future, there is a plan in place for the deployment of these technologies as part of the implementation of the NextGen portfolio such as DataComm and Taxi Conformance Monitoring.
11. Tower/Maintenance Communication	Evaluate current standards regarding communications between the air traffic control tower and maintenance vehicles at the airport.		9/30/2016	Complete 9/1/2015	IG has O acknowledged as complete.

SRMRA Wrong Surface Landings Report

Safety Recommendation	Item ID	Safety Requirement	Responsible Office	Target Due Date	Adjusted Due Date	Completion Criteria	Status
Investigate short- and long-term potential of air traffic and cockpit technologies (e.g., ADS-B, remote tower / camera display technology) to allow ATC and pilots to detect alignment problems.	WSL-SRMRA-01	Modify ASSC to be able to detect/alert taxiway alignment	AJI-14, AJM-232	09/2020	04/2021	Key site initial operations	In progress. 4/21/2021: ATAP software is now installed and collecting data in the background at the 8 operational ASSC airports. NAS Engineering (AJW-148) will use the data to optimize the alert for each airport. Target is to have alert enabled at all 8 airports by January 2022. 1/26/2021: The ASSC software build that includes Taxiway Arrival Alerting is installed and collecting data in the background at a MSY and CVG. 10/20/2020: ASSC Vendor completed testing in June. The NCP for ASSC ATAP was approved on September 21, 2020. NAS Engineering, AJW-148, will conduct formal software evaluation in October 2020. Deployment and initial operations at the original key site, San Francisco, requires travel to the site by AJW-148 personnel to install prerequisite hardware and software modifications. Due to COVID 19 travel and site restrictions, AJM-4 received approval to substitute another key site where the prerequisite system modifications are already installed. New Orleans is the proposed new key site with initial operations in April 2021. 6/18/20: Key site (SFO) target date pushed out to March 2021 due to COVID-19 travel and maintenance moratoriums. 1/14/20: Key Site target date December 2020. 10/30/2019: Key site target date September 2020. 8/1/2019: Taxiway arrival predication alert capability is being developed for Closed
	WSL-SRMRA-02	Based on results of ASDE-X taxiway enhancement capability testing, extend ASDE-X taxiway alignment capability to all equipped facilities, in collaboration with AJT, NATCA, Service Centers, AJW	AJW-148, AJI-14				The intent of the requirement has been met. Implementation will continue until complete. 2/14/2020: ATAP is enabled at 18 of possible 35 airports: ATL, BDL, BOS, BWI, CLT, DFW, DTW, FLL, IAH, LAX, MCO, MSP, ORD, PHL, SAN, SDF, SEA, and STL. Optimization is in progress at 7 additional airports and there is a plan in place for the remaining 10 airports. 9/27/2019: enabled at 13 of possible 35 airports Closed
	WSL-SRMRA-03	Locally adapt ASSC/ASDE X facilities' "callout box" feature to display extended runway centerline, as appropriate	ADS-14				Closed On going effort. 8/1/2019: Document and promote as best practice through Partnership for Safety (PFS).
Develop Safety Enhancements to address wrong surface landings via GA Joint Steering Committee (GA JSC) based on the findings and data in this document [WSL-SRMR].	WSL-SRMRA-04	Leverage terminal surveillance systems to detect, display, and/or alert to incorrect runway alignments	AJT-2/AJI-1, AJV-7	10/2020	TBD	Deploy to key site	In progress. 04/12/2021: Target OT&E dates - 8/17/21 – 9/23/21. Target keysite deployment (Omaha R90 which includes LNK) November 2021. If all goes well, plan is to deploy to as many sites as possible before the holiday moratoriums. 10/20/2020: No update available. 7/15/2020: No change. 4/15/2020: OT&E was scheduled in March, but canceled due to the COVID-19 Pandemic Travel Restrictions- scheduled impact unknown. 01/14/20: LNK selected as one of the key sites. 8/1/2019: STARS adaptations "Approach Runway Verification (ARV)" and "Monitor an Associated Flight Plan's Airport of Intended Landing" are in progress. Next prototype evaluation is in September 2019. Plan to deploy software build to keysite in October 2020. Once the software build is deployed nationally, enabling ARV will be determined facility by facility.
	WSL-SRMRA-05	Develop long-term plan for air traffic and cockpit technologies (with procedure development)	ANG-CS, AJI-14				Not adopted. Duplicate of RI SRMD Requirements numbers 12 and 16.
	WSL-SRMRA-06	Coordinate with FAAST Team to reach out to GA pilots recommending to pilots that they incorporate the ability to visualize the runways in technologies such as ForeFlight, etc.	AFS-800				Closed
	WSL-SRMRA-07	Update information in EFBs to assist flight crews in detecting alignment problems	AFS-200				Not adopted. There are existing features that do this that are better than EFBs, e.g. YouTube videos (www.youtube.com/watch?v=MkJzOlcntrU). Requirement will be worked as part of response to NSTSB Recommendation A-18-25.
Develop Safety Enhancements to address wrong surface landings via GA Joint Steering Committee (GA JSC) based on the findings and data in this document [WSL-SRMR].	WSL-SRMRA-08	General Aviation (GA) Joint Steering Committee (JSC) should review findings and data in this document [WSL-SRMR], evaluate the risk of wrong surface landings, and take action as appropriate.	AVP-200 GA JSC Co Chairs: Corey Stephens and Jens Hennig; General Aviation Manufacturers Association (GAMA) GA Issue Analysis Team (IAT) Co-chairs Chad Brewer and Jens Hennig (GAMA)				In progress. 4/21/2021: Corey Stephens provided to the SSG an overview of CAST and the GA JSC and how they operate. Chad Brew described a plan for specifically addressing the safety requirement. 1/26/2021 10/20/2020: No update specific to the safety requirement. 7/15/2020: GAJSC is currently working on the accident categories that have the highest fatality rates (flight loss of control, engine issues, CFIT and currently system component failure – non-powerplant). To address risks that fall outside the GA pareto, the GA Issues Analysis Team (GA IAT) works within ASIAs to look at issues and trends that could lead to a fatal accidents. At the request of the GAJSC, the GA IAT is currently conducting a study on GA wrong surface events to report back to the GAJSC. The study is ongoing and will be delivered to the GAJSC later this year. Depending on the results of the study, the GAJSC can form a working group to analyze wrong surface events and potentially develop mitigations. If the data in the study finds the risk is below the issues currently being worked in the GAJSC accident studies, the GAJSC can also choose to monitor GA wrong surface events but still report the results to its members to deliver back to their communities. The GAJSC has also been briefed on the excellent work being done by AOC on the wrong surface awareness videos. The GAJSC has promoted the videos to its members so they can pass the information back to their communities. Related to this, another potential outcome of the GA IAT study is that the findings can be fed back to AOC as a way to identify potential airports for future video development and give feedback on the effectiveness of existing videos. The GAJSC is also an avenue for briefings on wrong surface events. The Runway Safety office has briefed the GAJSC, which can then pass this information back to their members. The GAJSC and the Safety Analysis Team (SAT) are very effective means to get information out to the broad GA community. We welcome regular briefs to the SAT and we can work to set up additional briefs to the full GAJSC
Develop Safety Enhancements to address wrong surface landings via CAST (e.g., joint Crew Resource Management / Team Resource Management between air carriers and controllers) based on the findings and data in this document [WSL-SRMR].	WSL-SRMRA-09	Commercial Aviation Safety Team (CAST) should review findings and data in this document and evaluate the risk of wrong surface landings and take action as appropriate.	AVP-200			Final Report	In Progress. 4/21/2021: There is a draft report, but it hasn't been distributed for wide review. It will continue to be modified over the next 3-4 weeks. Once it's final it will be delivered to the SSG. 10/20/2020: The report has not been released yet. The next CAST Meeting is 12/3/2020. 7/15/2020: No update available. 4/14/2020: Work is continuing. No update on the target final report date. 2/15/20: Work is on-going. Target for releasing report was April. More to follow after the next meeting.
Communicate wrong surface landings hazard to air carriers and suggest they evaluate it as part of their respective SMS processes (e.g., via SAFO).	WSL-SRMRA-10	Update SAFO 17010 or issue a new SAFO to inform part 121 air carriers of the existence of the wrong surface landings hazard and to recommend that operators address the hazard in their Part 5 SMS processes; recommend (Certificate Management Offices) CMOs to review the results with the air carriers.	AFS-200, AFS-900				In progress. 4/21/2021: SAFO has come back from legal and is in the final signature process. 1/26/2021: SAFO is still with legal. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is with legal for review. 2/14/20: SAFO is in formal review and comment. 1/14/20: SAFO is drafted, target release by the end of the fiscal year.
	WSL-SRMRA-11	Using available means, inform all commercial operators of the wrong surface landings hazard for internal evaluation under their safety system; recommend CMO review the assessment results and mitigation actions with the operators	AFS-200, AFS-800, AFS-900				This will be closed with WSL-SRMRA-10. 4/21/2021: SAFO has come back from legal and is in the final signature process. 1/26/2021: SAFO is still with legal. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is out for legal review. 2/15/20: SAFO is in formal review and comment. 1/14/2020: In progress. 5/1/2019: Safety Assurance System (SAS) is the surveillance tool used by Flight Services inspectors to conduct their risk-based, data-driven oversight model. SAS is being enhanced to include a surface safety feature.
	WSL-SRMRA-12	Encourage the incorporation of awareness of wrong surface landings into recurrent training curriculum	AFS-200, AFS-800, NBAA, AOPA				Closed. 1/14/20: Advisory Circular (AC) 6198 has a lengthy section on runway incursion avoidance that includes wrong surface language. That AC has the guidance for conducting flight reviews and proficiency checks, and we have included in the pilot simulator animation as a resource.
Encourage GA, air carriers, and Part 142 Recurrent Training providers to incorporate scenario-based wrong surface landings and prevention into course materials / simulators. Leverage data and findings of this document [WSL-SRMR] in the development of these materials/simulations, especially with regard to active listening during clearances and readbacks.	WSL-SRMRA-13	Provide notice to the Certificate Management Offices (CMOs) regarding training for wrong surface landings events	AFS-200, NBAA, AOPA				This will be closed with WSL-SRMRA-10. 1/26/2021: SAFO is still with legal. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is with legal for review. 2/15/20: SAFO is in formal review and comment. 1/14/2020: In progress.
	WSL-SRMRA-14	Coordinate messaging for industry outreach efforts (including AOPA, ALPA, NBAA, and A4A) regarding awareness of wrong surface landings.	AFS-800				Closed. On going activity. Coordinated through the SSG and RSC.
Review AC 150/5300-13A, <i>Airport Design</i> , to address wrong surface landing factors with a focus on improving airport design to reduce potential for incorrect pilot perception of landing surface (e.g., additional requirements for offset parallel runways, rounded off taxiway corners, contrasting paint).		Review data regarding wrong surface landing events to identify any correlation to potential changes to the following ACs accordingly: AC 150/5300-13, Airport Design AC 150/5340-30, Design and Installation Details for Airport Visual Aids AC 150/5340-18, Standards for Airport Sign Systems AC 150/5340-1, Standards for Airport Markings	AAS-100, AAS-300				Closed. 9/27/2019: AAS-300 Delivered the final report. 8/1/2019: No update. 05/22/19: Final review by upper management is in progress. Note: Updates to AC 150/5340-1M and AC 150/5340-18 G were published 5/10/2019 along with Engineering Brief # 100 "Holding Position Sign for Runway Approach/Departure Aaas"
Document past efforts that have successfully reduced the risk of wrong surface landings. Upload documentation in HIRMT when complete.	WSL-SRMRA-16	Send information regarding past efforts that have successfully reduced the risk of wrong surface landings to AFS (OPR) to upload into HIRMT	AJI-14				Not adopted. No past efforts have been identified that have successfully reduced WSL.
Conduct a research study to investigate the effect of lighting systems in the prevention of wrong surface landings (e.g., lighting mixture, approach light system, intensity of lighting, intensity differential between runway and taxiway lighting used in unison as seen from a distance, taxiway lights, centerline lights, etc).	WSL-SRMRA-17	Conduct a research study to investigate the event data and identify contributing factors and common causes. Study should include examination of lighting systems, airport geometry, and other factors in preventing wrong surface landing events; Perform the following analysis: • Isolate those airports where approach/airport lighting may have been a factor • Determine commonalities of the events • Airports with reoccurring events • Perform "Deep Dives" into specific events o Determine what lighting system assets are located at the airports o Examine ATC Facility Directives in the place at the time of the event	ANG-E26 AAS-100 AAS-300				Closed Report was submitted 9/30/2019 10/7/2019: Report titled "Research Study of Airport-Related Contributing Factors and Common Causes of Wrong Surface Landings" was submitted to the Office of Airports Safety & Standards (AAS) on September 30th. 8/1/2019: 21 airports were selected for the study. Preliminary findings are available. The final report is expected at the end of September.
	WSL-SRMRA-18	Initiate proper coordination with ATO for procedure development related to the effect [results of #17 research] on FAA Order JO 7110.65 Air Traffic Control	ANG-E26				Closed. 5/19/21: The RSC accepted the SSG's recommendation to close this item. 4/21/2021: The draft report is almost 2 years old and didn't contain any significant findings. The SSG will make a recommendation to the RSC to close this and put efforts into something more relevant. 1/26/2021: Once COVID restrictions are eliminated, Airports will coordinate with NextGen to further the study. Steve Debban, AAS-110, just submitted an ambient light research request along with other airport specific solutions. The effort will most likely take a
Based on research in #8, form group to review findings and determine effect to FAA Order JO 7110.65.	<i>Note: the SRM Team agreed that this recommendation was more appropriate to be included in requirement 18.</i>						
Review SAFO 17010, <i>Incorrect Airport Surface Approaches and Landings</i> , to include additional recommendations based on this SRM Team's discussions to help prevent wrong surface landings.	WSL-SRMRA-19	Review SAFO 17010, <i>Incorrect Airport Surface Approaches and Landings</i> , to include additional recommendations based on this SRM Team's discussions to help prevent wrong surface landings	AFS-200				This will be closed with WSL-SRMRA-10. 1/26/2021: SAFO is still with legal. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is out for legal review. 2/15/20: SAFO is in formal review and comment. 10/29/19: Consolidated with WSL-SRMRA-10. 8/1/2019: June 19, 2019 Memorandum for the Record from Nick DeLotell, ASI AFS-820 to Rebecca Morris, Manager AFS-820., recommending specific, CFR updates, SAFO updates, AC updates and Flight Instructor refresher courses updates.
Work with industry organizations to raise awareness of SAFO 17010, <i>Incorrect Airport Surface Approaches and Landings</i> , and FAAST Blast (e.g., backing up visual approaches with navigational aids).	WSL-SRMRA-20	Distribute information to the CMOs regarding the updated SAFO 17010 (or new SAFO) to increase awareness of the current situation to the carriers. Provide additional FAAST Blast regarding new/updated SAFO.	AFS-200 AFS-800				This item will be closed with WSL-SRMRA-10. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is out for legal review. 2/15/20: SAFO is in formal review and comment. 10/29/19: Consolidated with WSL-SRMRA-10. 8/1/2019: June 19, 2019 Memorandum for the Record from Nick DeLotell, ASI AFS-820 to Rebecca Morris, Manager AFS-820., recommending specific, CFR updates, SAFO updates, AC updates and Flight Instructor refresher courses updates.
Task OpSpecs working group to add guidance for non-charted visual approaches to use all available NAVAIDS (ref. C077, <i>Terminal Flight Rules Limitations and Provisions</i>).	WSL-SRMRA-21	Coordinate with OpSpecs working group to add guidance for non-charted visual approaches to use all available NAVAIDS (ref. C077, <i>Terminal Flight Rules Limitations and Provisions</i>).	AFS-200 AFS-800				In progress. 4/21/2021: The OpSpecs working group has met a couple of times since January, but a proposal is still pending. The FS Runway Safety team is organizing to move this forward. 1/26/2021: Waiting for the next OpSpec working group. 10/20/2020: Nick DeLotell had planned attend the September meeting of the OpSpecs working group, but it was canceled. The next meeting/opportunity will be in March or April 2021. 7/15/2020: Flight Standards (Nick DeLotell) is on the agenda for the Task OpSpecs Working Group in September, to brief the white paper that was developed. 1/14/2020: Charted approaches are out there but we need to see how ATC will clear them in and there should be no runway change on the inbound. We are aware of it and looking at it, but we do not want to introduce confusion.
Update Pilot's Handbook of Aeronautical Knowledge to include wrong surface landings awareness and avoidance and propagate this information through training, testing, checking requirements.	WSL-SRMRA-22	Update Pilot's Handbook of Aeronautical Knowledge to include wrong surface landings awareness and avoidance and propagate this information through training, testing, checking requirements.	AFS-800				This item will be closed in coordination with WSL-SRMRA-10. 4/21/2021: SAFO has come back from legal and is in the final signature process. 1/26/2021: SAFO is still with legal. 10/20/2020: SAFO is still with AGC for legal review. 7/15/2020: Undergoing legal review on behalf of DOT so it will be a public document. It should be published by the end of the fiscal year. 4/14/2020: The SAFO is out for legal review. 2/15/20: SAFO is in formal review and comment. 10/29/19: Consolidate with WSL-SRMRA-10. 8/1/2019: Handbook last updated 2016. Need to determine what needs to be
Include "Wrong Surface operations" prevention information (once developed) in the Commercial Pilot Airplane Knowledge Test and Airline Transport Pilot (ATP) Airman Certification Standards (ACS) (note or element (knowledge/risk/skill)), to ensure applicants are examined on their ability to proactively defend against wrong surface operations.	WSL-SRMRA-23	Include "Wrong Surface operations" prevention information (once developed) in the Commercial Pilot Airplane Knowledge Test and Airline Transport Pilot (ATP) Airman Certification Standards (ACS) (note or element (knowledge/risk/skill)), to ensure applicants are examined on their ability to proactively defend against wrong surface operations.	AFS-800				Closed. 2/12/20: Closing as recommend by the SSG. 1/14/20: Recommend closing as complete. An SSG Action Item 068 was opened to conduct evaluation to determine what gaps may exist; determine how Pilot Knowledge Test can be updated to close the gaps. The analysis will be conducted after enough time has passed to collect sufficient data. 10/29/19: RSG confirmed surface safety items were added; although, none specifically address wrong surface. Additional evaluation and analysis will be needed. 8/1/2019: The ATP ACS has been adopted. Recommendation for Runway Safety Group to revalidate ATP certification questions to closeout.
Strengthen and improve ATO Human Performance Analysis in Investigations training to improve data collection for further analysis. Provide training to AVS investigators.	WSL-SRMRA-24	Strengthen and improve ATO Human Performance Analysis in Investigations training to improve data collection for further analysis by: -Providing training to AVS investigators -Creating and/or improving tools for investigations of pilot deviations -Establishing data sharing partnership between ATO and AVS (AFS)	AJI-15				In progress. 1/26/2021: HF team still waiting for feedback from RSG. 10/20/2020: The Taxonomy report was completed and submitted the Runway Safety Group (RSG) for a determination as to the next steps. The WSL_FTD video has been widely distributed and is available on the FAA website. 7/15/2020: ATAC is using PDARS data to create an environmental taxonomy of WS events that categorizes them by time of day, year, weather AOC will shoot video of airport hot spots for WS that will show what different configurations look like from the pilot's perspective with guidance about what to watch out for 4/14/2020: No update available. 2/12/20: The FAA Human Performance Team has delivered a report "AJI human
	WSL-SRMRA-25	Add ATO Human Performance Training information to the AVS investigator training curriculum	AVP-100				No status. Dependent on outcomes of WSL-SRMRA-24
Create and/or improve tools for investigations of pilot deviations (e.g., incorporate human factors, develop checklists, improve taxonomy, assess possible improvement to or replacement of ATQA) to improve data collection for further analysis.	WSL-SRMRA-26	Incorporate ATO Human Factors improvements/recommendation into FAA Order 8900.1, Flight Standards Information Management System, specifically pilot deviation investigation process and format.	AJI-3 AFS-820				Closed.
Establish data sharing partnership between ATO and AVS (AFS) such that events can be depicted from both ATC and pilot perspectives.	WSL-SRMRA-27	Establish agreement for a data sharing partnership between ATO, ARP, and AVS such that events can be depicted from all perspectives	AJI-155, AJI-12, AJI-14, AAS-1, AFS-200, (SDAT7)				Closed.
Assess airports to determine locations for possible focused regional RSATs.	WSL-SRMRA-28	Conduct special-focus RSATs on wrong surface landings	AJI-14				Closed. 9/26/2019: All 9 planned complete PHL, BNA, CNO, LNK, STS, BOI, SAT, FCM BED.
Research and develop a "Challenge and Response" confirmation of "Right Surface Landings" between Controller and Pilot. Also, research the worth of "sanctioned" radio queries or input from aircraft "holding short."	WSL-SRMRA-29	Based on review of wrong surface landings data, evaluate FAA Order JO 7110.65, Air Traffic Control, to determine if an emphasis on a runway assignment change with a landing clearance is needed.	AJI-1, AJI-3, AJI-155				Closed.
	WSL-SRMRA-30	Based on review of wrong surface landings data, evaluate FAA Order JO 7110.65, Air Traffic Control, to determine if readback of changed runway assignment with a landing clearance is needed.	AJI-1, AJI-3, AJI-155				Not adopted. AJV-8 has stated that they would not support any requirement to elicit a readback. Data shows that pilots will deviate from clearances even with a correct readback, and this change could introduce unintended risk during a critical phase of
International industry outreach efforts to raise awareness of wrong surface landings.	WSL-SRMRA-31	Increase international industry outreach efforts to raise awareness of wrong surface landings.	AFS-50, AJI-14				IATA attended SFO special focus RSAT. IATA was also a panelist on the FAA safety summit.