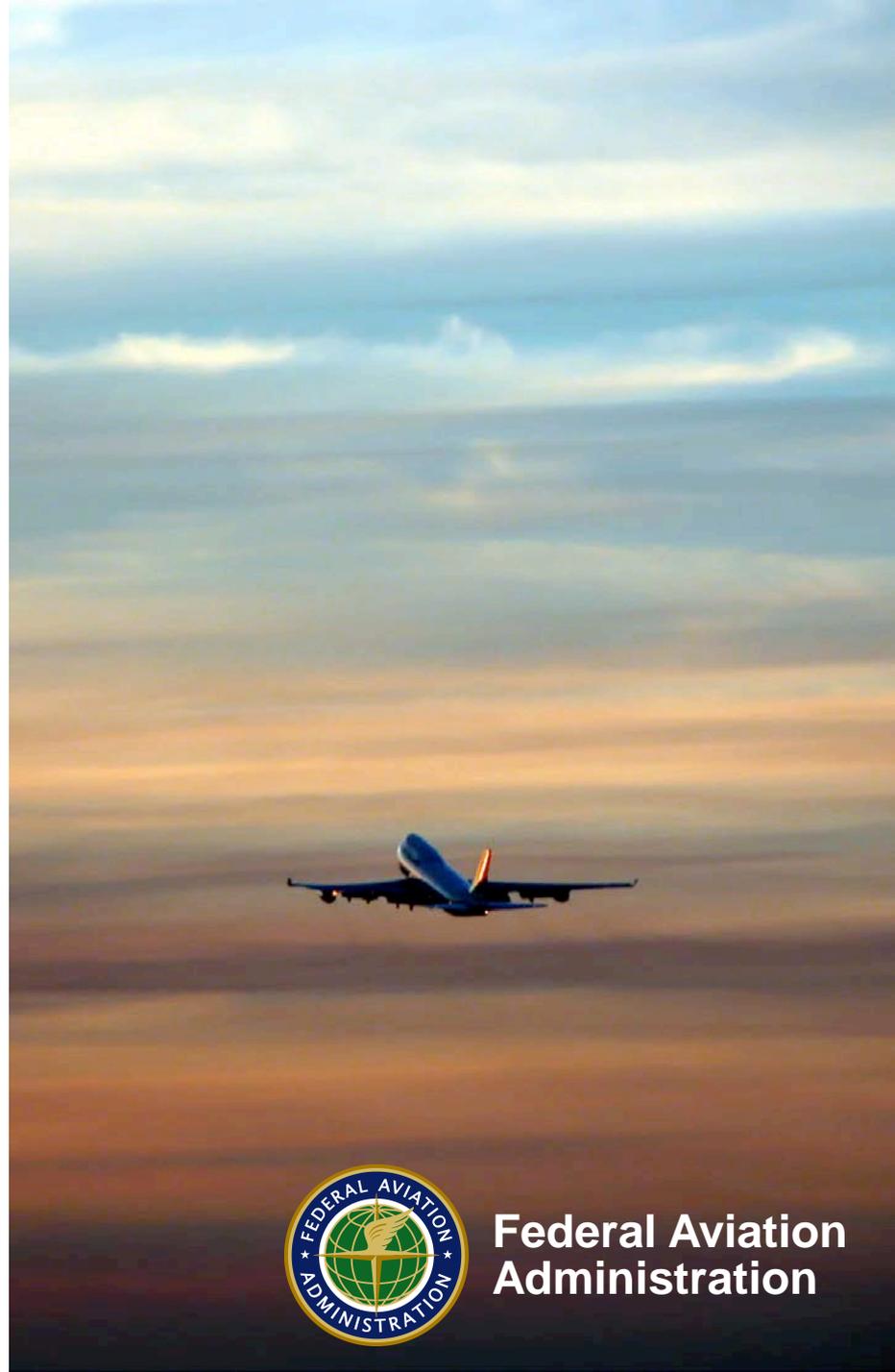


# Independent Oversight of an ANSP's SMS

Presented to: ICAO NACC Region  
By: Michael Beckles, FAA  
Date: July 18, 2018



**Federal Aviation  
Administration**



# Safety Management Requirements

- **Safety management requirements are contained in ICAO Standards and should be incorporated into national policy**
  - Annex 19 contains the international aviation safety management standards
  - The ICAO Safety Management Manual (Doc 9859) provides supporting guidance to regulators and service providers



# Safety Management Requirements

- The introduction of safety management requirements makes the oversight function even more important!
  - While the ongoing management of safety is the responsibility of the ANSP, there is a need for independent oversight of the safety management practices and safety performance of the provider
- Implementation of the eight critical elements will help regulators to ensure effective safety oversight



# Roles and Responsibilities

- The **State (regulator)** is responsible for State safety management (**SSP**), which includes establishing requirements for Safety Management Systems in accordance with international standards
- **Service providers** are responsible for developing and implementing Safety Management Systems according to applicable requirements



# AOV History

2010

•AOV approves the ATO SMS

2005

Creation of AOV

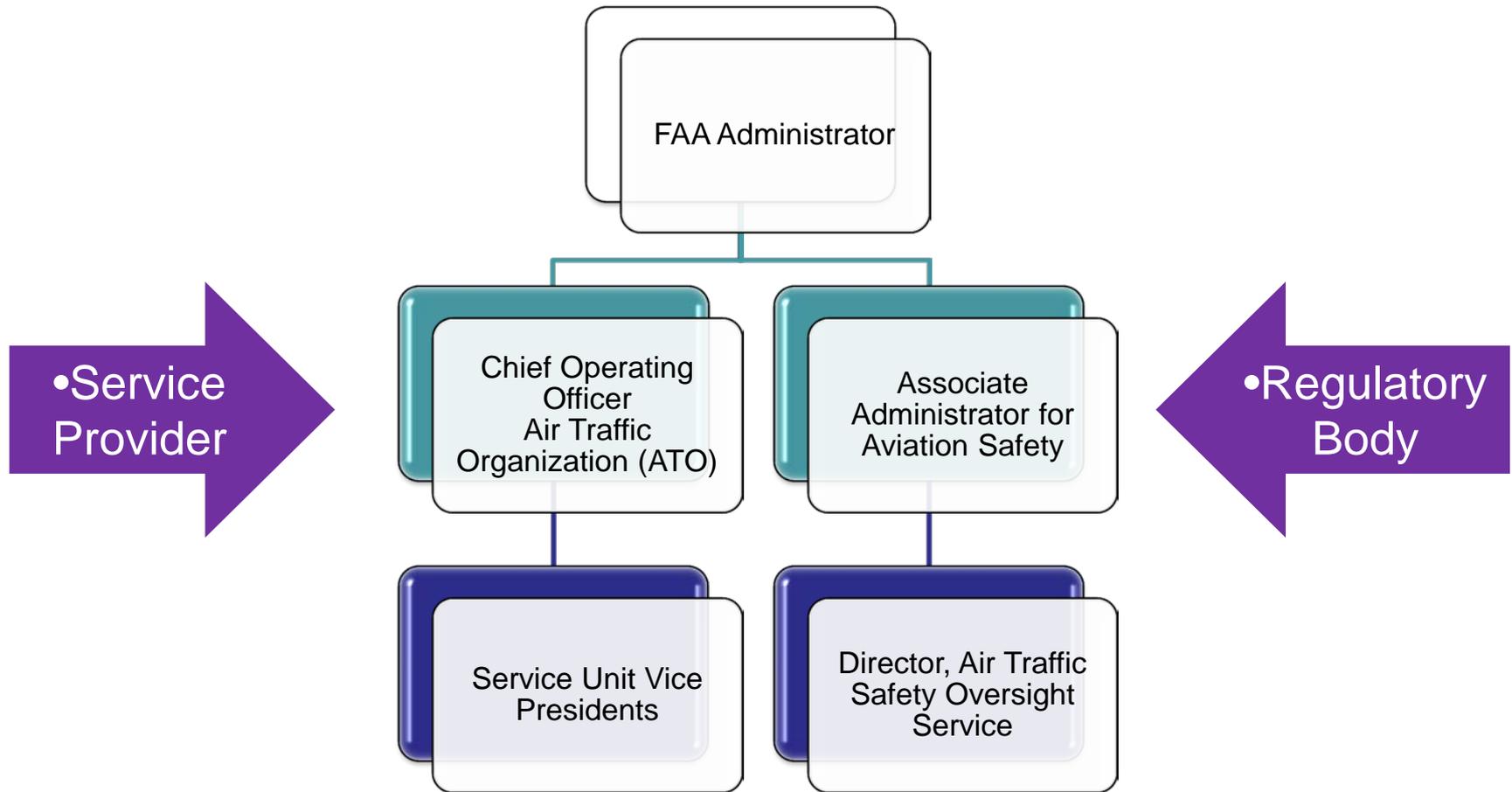
2003

ATO is established as a performance-based organization

2001

ICAO requires formal safety management programs for ANSPs

# FAA Regulator-Service Provider Relationship



# What is the SSP?

- A **State Safety Program** is a management system for the regulation and administration of safety by the State
  - Integrated set of regulations and activities aimed at improving safety
  - Currently only between FAA and NTSB



# SSP Goals

- The SSP objectives are to:
  - Ensure that the minimum required regulatory framework is in place
  - Ensure harmonization among a State's regulatory and administrative organizations
  - Facilitate monitoring and measurement of the industry's safety performance
  - Coordinate and continuously improve the State's safety management functions
  - Support effective implementation and interaction with the service provider's SMS



# FAA Example: SSP Focus Areas

- **Key focus areas for air traffic oversight:**
  - 1.2 – State safety responsibilities and accountabilities
    - Includes the air traffic safety oversight authority in this section and identify its SSP responsibilities
  - 1.4 – Enforcement policy
    - Describes the air traffic oversight authority’s relationship with service providers
    - Identifies enforcement authority
  - 2.1 – Safety requirements for the service provider’s SMS
    - Describes the SMS requirements for the ANSP enacted by the air traffic oversight authority



# FAA Example: SSP Focus Areas

- **Key focus areas for air traffic oversight:**
  - 2.2 – Agreement on the service provider’s safety performance
    - Highlights requirements to measure performance and identify required performance indicators
  - 3.1 – Safety oversight
    - Describes the air traffic oversight authority’s core functions and oversight methodologies
  - 3.2 – Safety data collection, analysis, and exchange
    - Highlights voluntary safety reporting programs



# Establish a Baseline

- A **baseline** is the date upon which all written processes, procedures and specifications existing at the time, were accepted as the *starting point* for oversight of safety of the airspace system
  - Baselines must be established where none exist



# Establish a Baseline

- **Acceptance of the baseline does not imply that the State airspace system is or is not inherently safe as configured, nor should it imply that the airspace system has no existing high risks**
  - The acceptance of the baseline means that *compliance with the SMS is required for all changes in the airspace system going forward*

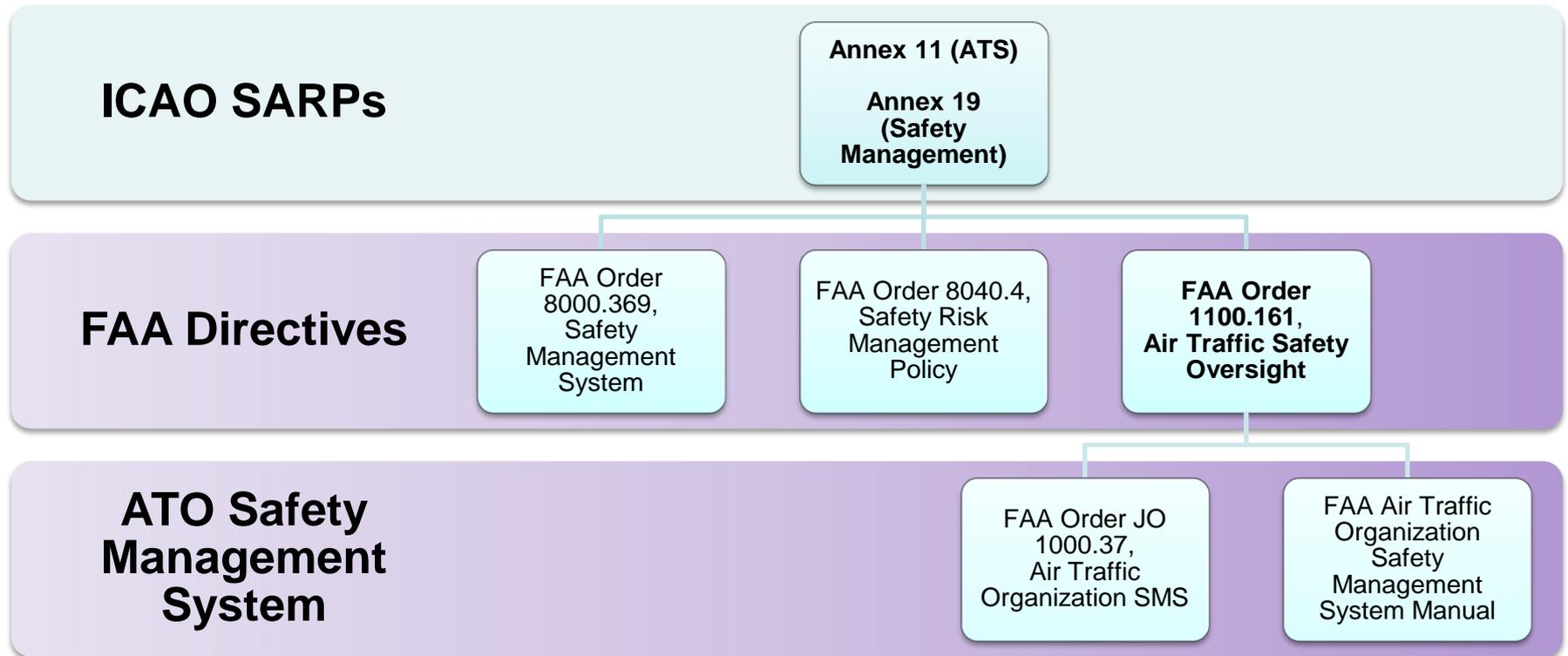


# FAA Example: SMS Baseline

- **FAA Order 1100.161 accepted the status of the U.S. National Airspace System (NAS) as the baseline as of March 2005**
  - Existing system was accepted as the starting point for oversight of safety in the NAS
  - The service provider is required to maintain the NAS at a safety level at least equal to the baseline
  - It was understood that development and full implementation of an SMS would require several years
    - Order 1100.161 included a section describing the method by which the service provider would operate while developing and implementing the SMS



# FAA Example: SMS Policy



# Establish Requirements

- **Provide a flexible framework that is objective or performance-based rather than prescriptive**
  - Regulations must allow for SMS implementation in both existing service providers (who will be transitioning to an SMS) and new applicants (who may be starting an SMS from nothing)
- **Develop guidance material to ensure that both regulatory staff and service providers understand requirements**
  - Reference existing guidance material where possible
  - Safety Oversight Circulars



# FAA Example: The AOV SSO

- **The Air Traffic Safety Oversight Service may establish safety standards related to:**
  - Personnel licensing
  - Acquiring and implementing new systems
  - Air traffic control functions
  - Equipment and facility maintenance functions
  - Flight inspection functions\*
  - Flight procedure design\*



# FAA Example: The ATO SMS

- **The ATO (SP) has the following responsibilities regarding the SMS:**
  - Develop and maintain an SMS and submit it, and any changes thereto, to AOV for approval
  - Comply with the approved SMS
  - Develop and maintain a hazard tracking database in which all types of medium and high risk hazards are tracked, and provide continuous AOV access to the database



# Focus Areas for Air Traffic Oversight

## State Safety Policies and Objectives

Responsibilities  
and  
Accountabilities

Enforcement  
Policy

### State Safety Risk Management

Requirements for  
Service  
Provider's SMS

Service  
Provider's Safety  
Performance

### State Safety Assurance

Safety Oversight

Data Collection, Analysis, and  
Exchange



# Challenges for Regulators

- **Effective safety oversight of Safety Management Systems requires:**
  - Performance-based approach to regulation
  - Safety inspectors to be:
    - Familiar with SMS concepts
    - Trained in performance-based assessments
  - Collaboration with service providers to:
    - Develop agreed implementation schedules and safety performance targets
    - Share compliance and safety information
  - Addressing resource constraints



# Train Personnel

- **Identify important competencies**
- **Develop a competency framework**



# What Is A Competency?

- **Competencies** are the integrated knowledge, skills, judgment, and attributes that people need to perform a job effectively
- A **competency framework** is a structure that identifies and defines each individual competency required to work in an organization or part of an organization



# Why Do We Need Competencies?

- **Employees need the skills and knowledge to effectively perform SMS oversight**
  - Regulators should consider how these competencies fit into their overall authority level competencies
  - It is not recommended or intended for regulators to have multiple sets of competencies that could be inconsistent or divergent from each other



# Why Do We Need Competencies?

- **Defining which SMS-related competencies are necessary for success can help regulators to:**
  - Recruit and select new staff more effectively
  - Ensure that employees demonstrate sufficient expertise
  - Evaluate performance more effectively
  - Identify skill and competency gaps more efficiently
  - Provide more customized training and professional development
  - Plan for succession



# Example: ATSI Training Plan

## New Hire

FAA Office of Aviation  
Safety Overview  
Course

Air Traffic Safety  
Oversight Service  
(AOV) Overview  
Briefing

AOV Onboarding  
Peer Sponsor

## Initial Technical Training

SMS Basics for Aviation  
Safety

SMS/Safety Risk  
Management Overview

Credentialing  
(Licensing)

AOV Audit Skills  
Course

Auditing – OJT

## Recurrent Technical Training

Auditing – OJT  
SSO/SMS - OJT

Recurrent ATSI  
Training

## Supplemental Skills Training

Additional Training:  
Accident Investigation\*

Records Management

Staff Work

Report Writing



# Break



# Surveillance

- **Surveillance methodology should be:**
  - Compliance-based
    - Is it based on adherence to safety standards
  - Performance-based
    - Does it allow you to effectively evaluate an SMS within its operating context?
    - Does it assess the performance and effectiveness of the SMS?
  - Risk-based
    - Applicable to individual or groups of service providers, based on risk profiles, focuses resources

Safety Management International Collaboration Group: How to Support a Successful SSP and SMS Implementation

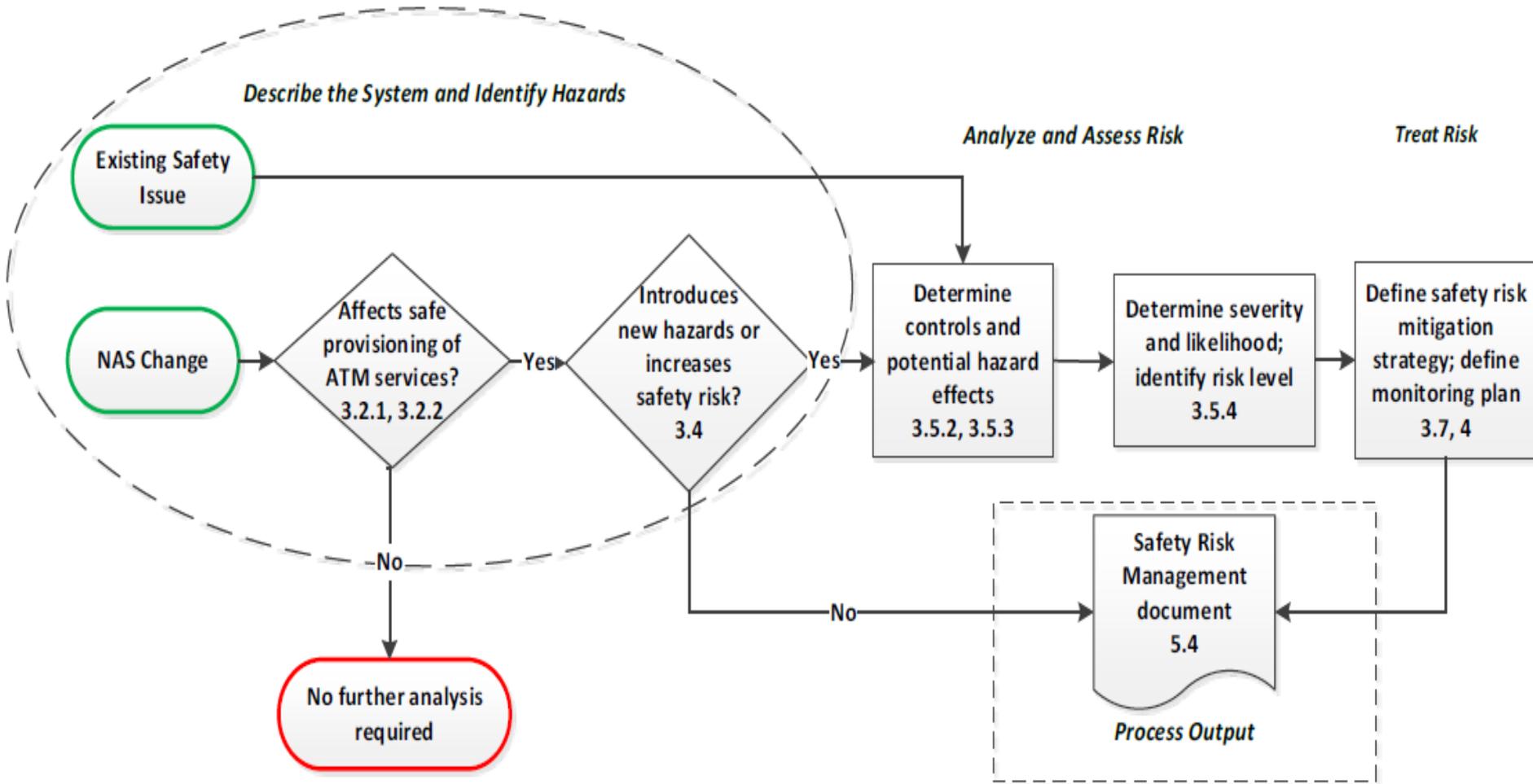


# Managing Change

- **Decisions to acquire new systems or implement new procedures must be made in accordance with the ANSP's SMS manual**
- **The regulator should also engage in the service provider's acquisition process**
  - Safety Risk Management for Systems Acquisitions
  - This involvement benefits both the regulator and the ANSP(s)



# SRM Safety Analysis Process



# SRM: Five Phases

**D**

- Describe the System

**I**

- Identify Hazards

**A**

- Analyze Risk

**A**

- Assess Risk

**T**

- Treat Risk

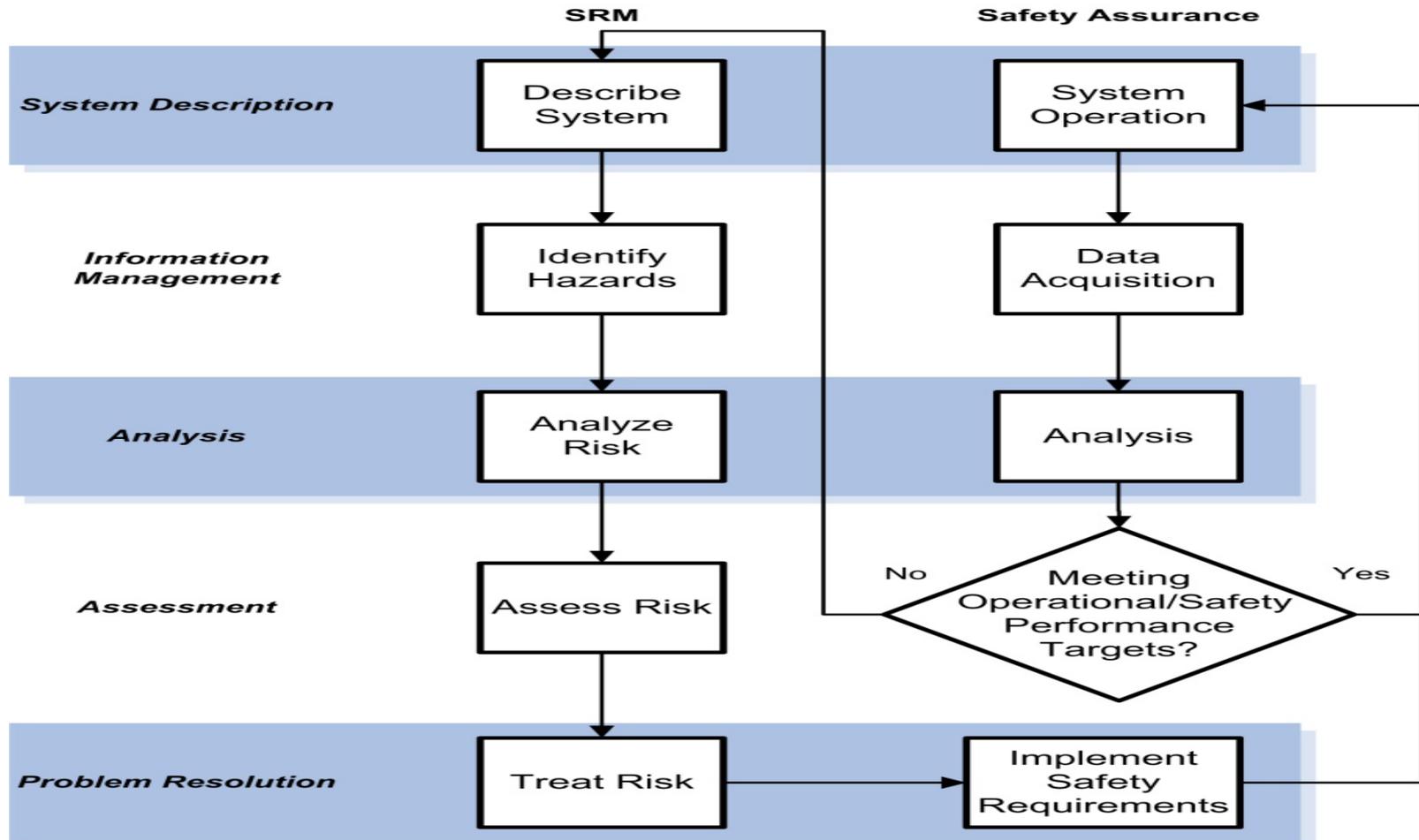


# FAA Example: A/A/C QMS Process

- **The Air Traffic Safety Oversight Service (AOV) has the authority to *establish* safety standards**
  - The Air Traffic Organization (ATO) must submit change proposals, safety risk mitigations, and corrective actions to AOV for *approval* or *acceptance*
  - The ATO is required to obtain AOV *concurrence* for other actions (ICAO IGIA, NTSB/GAO/OIG Recs)
- **The Approval/Acceptance/Concurrence (A/A/C) process enables AOV to prioritize, evaluate, and process requests from the ATO and other external organizations**

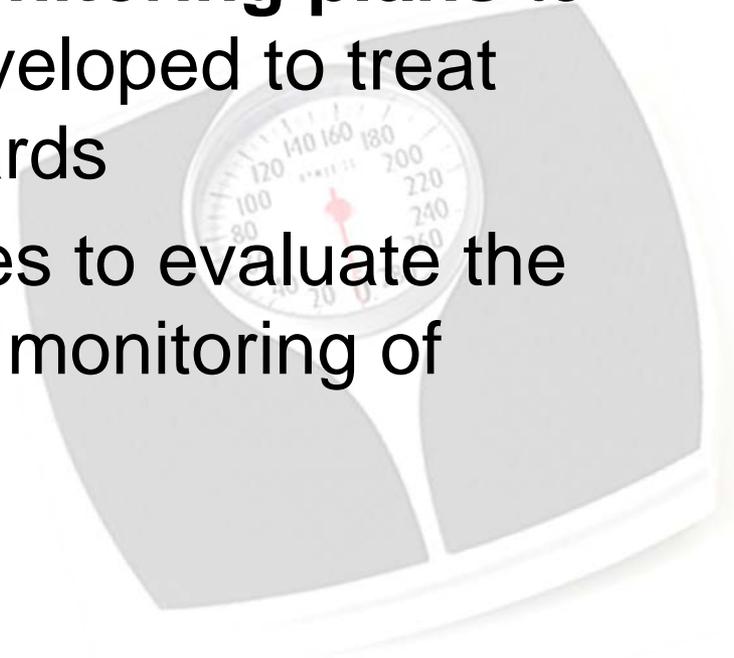


# Risk Verification and Validation



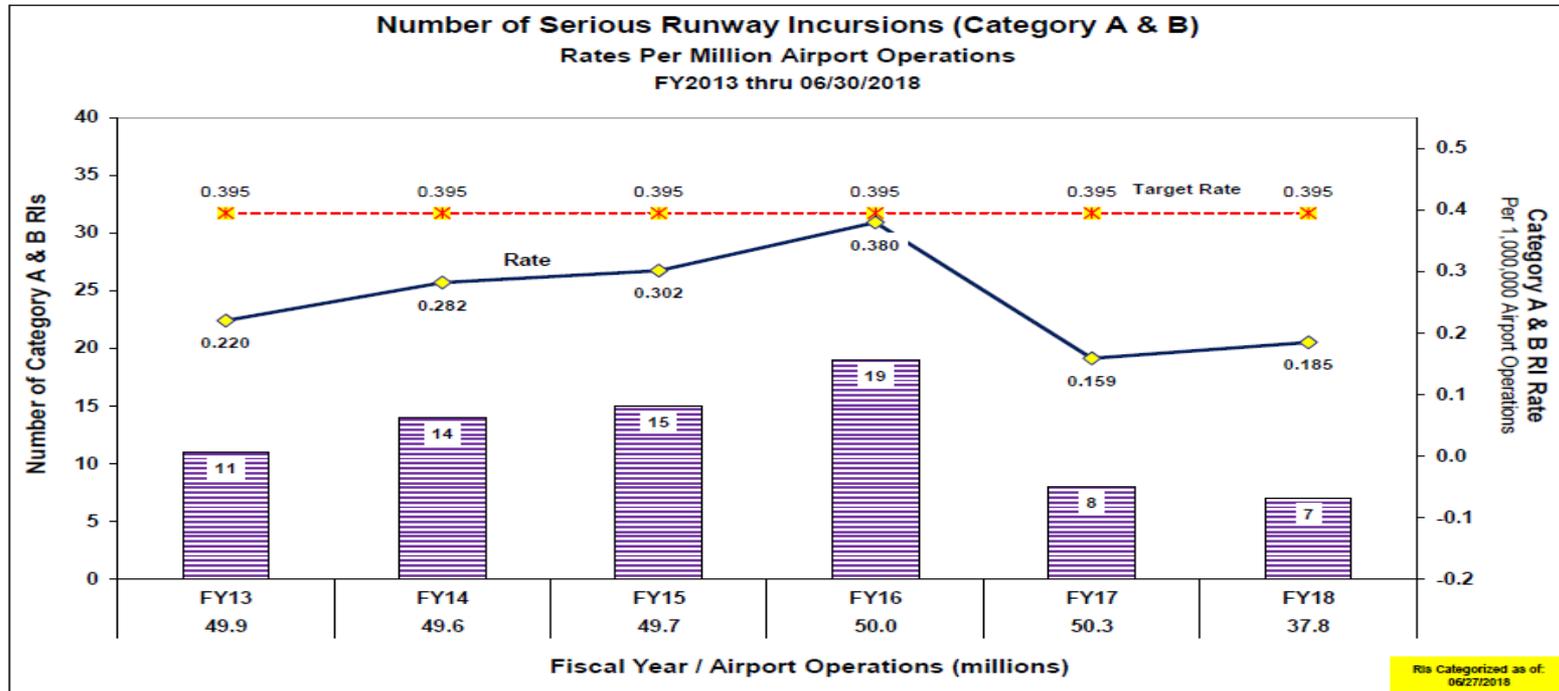
# Monitoring Performance

- The ATO must develop **monitoring plans** to oversee the mitigations developed to treat medium and high-risk hazards
- AOV will develop techniques to evaluate the ATO's implementation and monitoring of mitigations



# Monitoring Performance

## Runway Incursion Charts for AVS Dashboard



TOTAL AIRPORT OPERATIONS = 37,842,604 (as of 06/30/2018)

Analysis by: Frank Wondolowski (AOV-150) (202-267-4271)

Chart 1 of 8

Data from: ATO Runway Safety Group Database



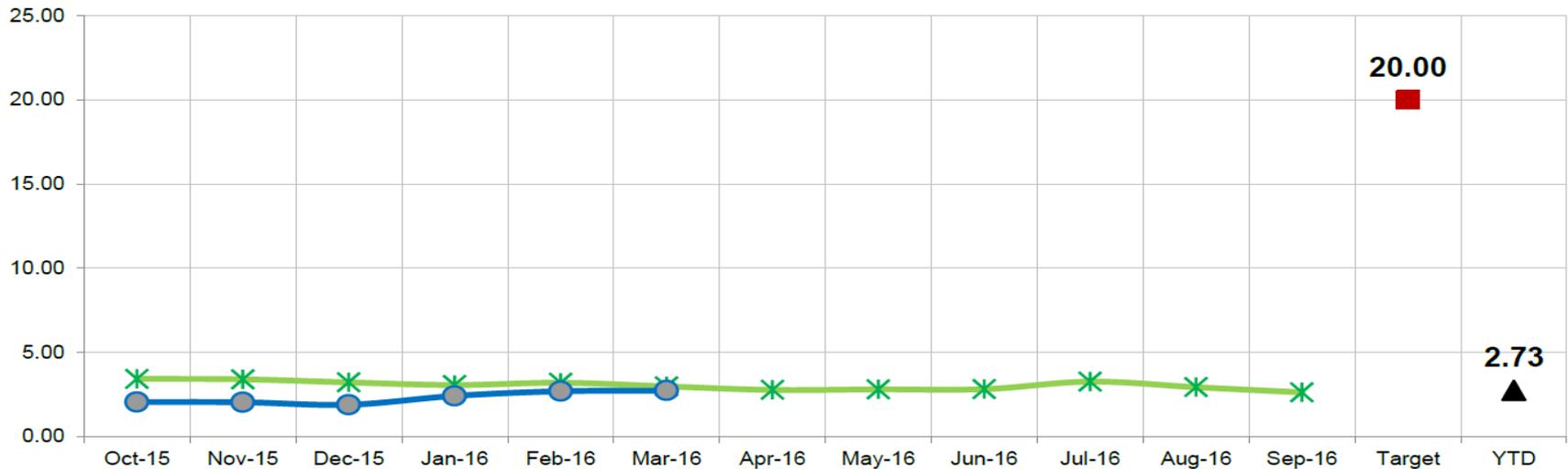
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# Monitoring Performance

## System Risk Event Rate (SRER)

Current vs. Previous 12 Months, Rolling

Previous Current YTD Target



Rolling 12 - Current	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16
Serious Loss of Standard Separation	588	572	574	590	762	668	682	649	682	607	497	461
Total Loss of Standard Separation	2	2	3	3	0	0	0	2	1	3	3	0

Rolling 12 - Previous	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15
Serious Loss of Standard Separation	747	665	602	646	647	585	615	598	640	562	512	567
Total Loss of Standard Separation	4	2	3	0	2	2	4	2	2	0	1	0

SRER Calculation: (Serious Loss of Standard Separation) / (Total Loss of Standard Separation) \* 1,000

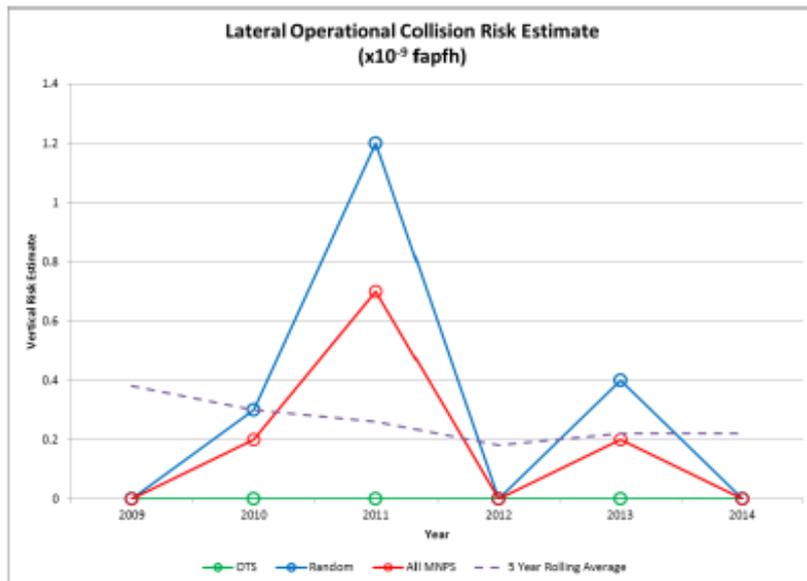


# Monitoring Performance

## NAT MWG/51 Static Dashboard

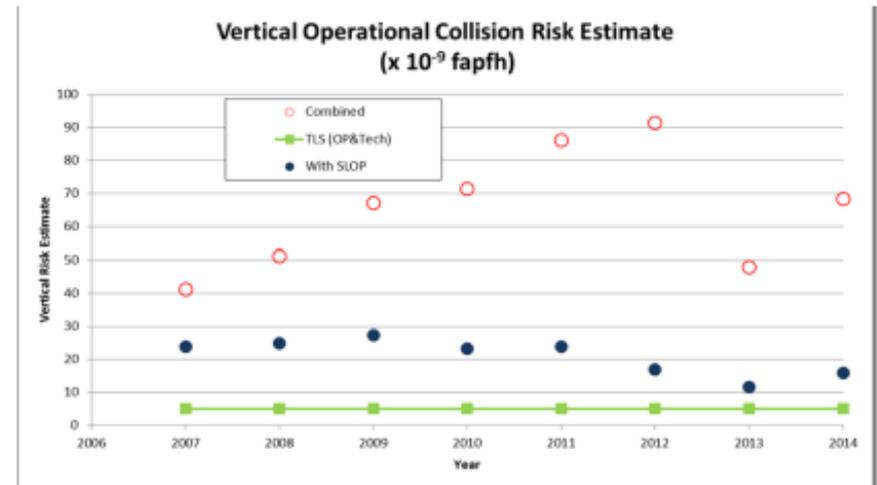
### Lateral Risk:

- 0.0 fapfh as no risk bearing GNEs were observed in 2014 (TLS =  $20.0 \times 10^{-9}$  fapfh);
- Rolling 5 year average:  $0.22 \times 10^{-9}$  fapfh. No change from 2013.

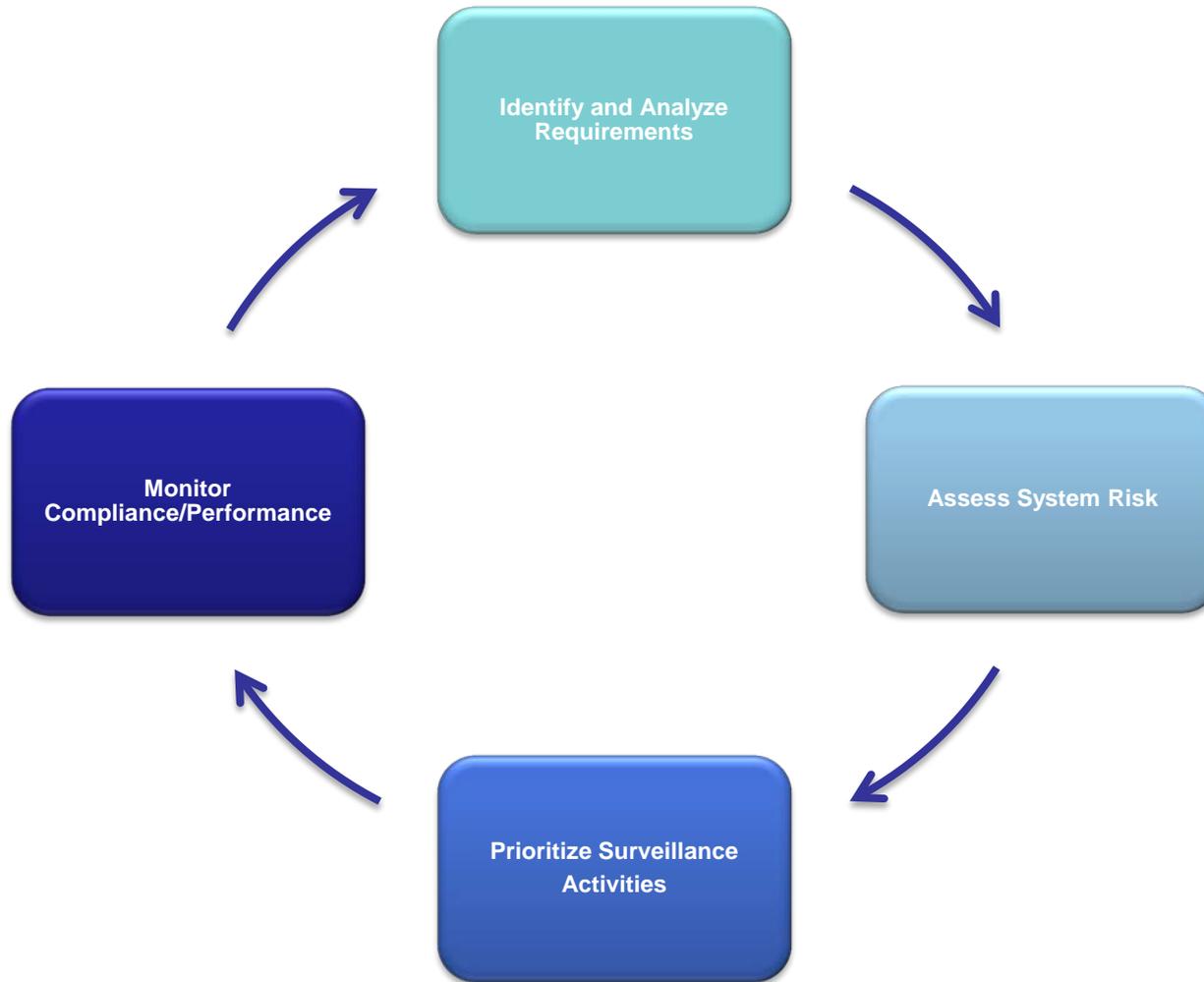


### Vertical Risk:

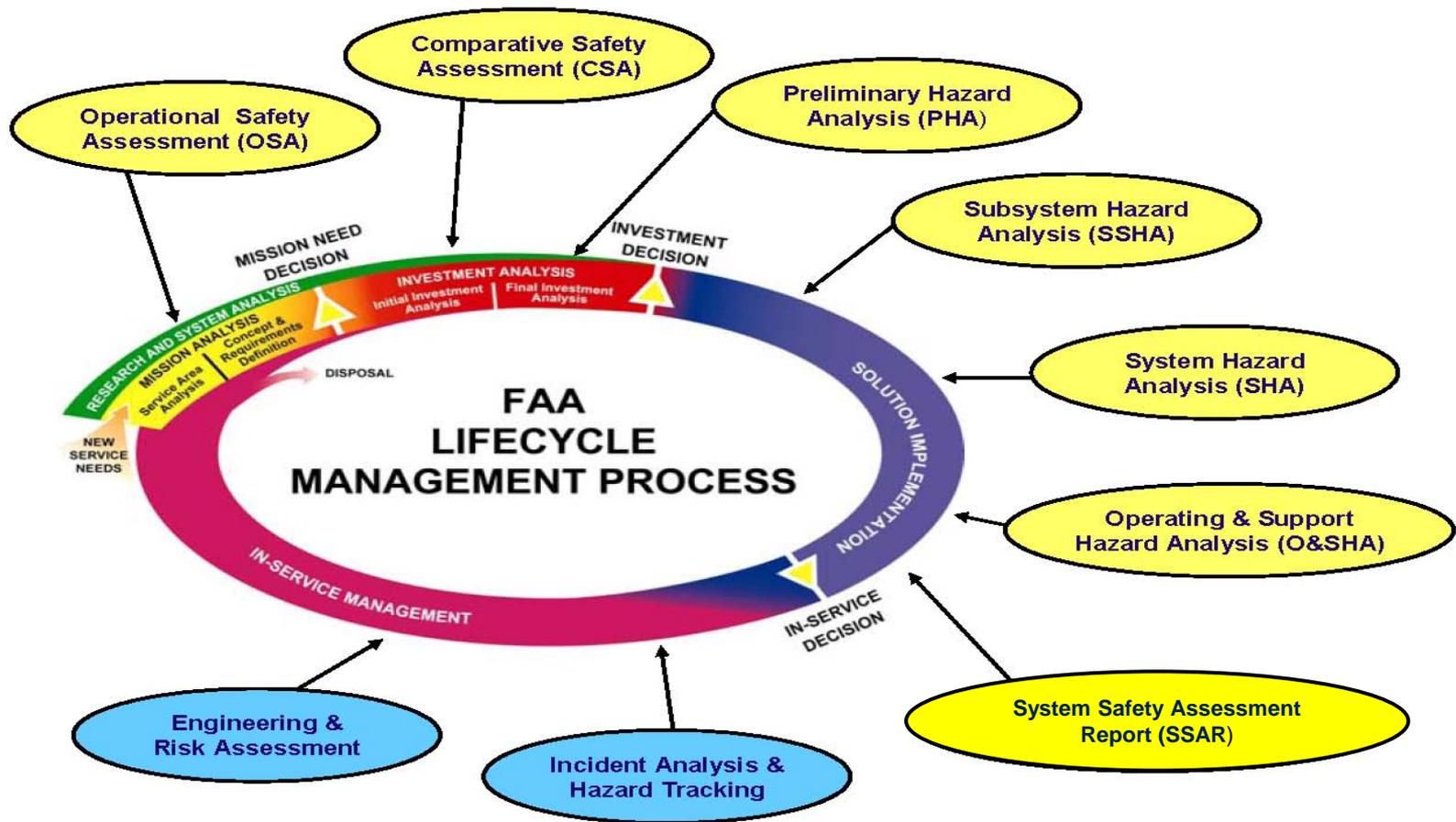
- $68.3 \times 10^{-9}$  fapfh. Increase of 42% from 2013;
- $15.9 \times 10^{-9}$  fapfh including SLOP benefits;
- Increase primarily due to one Category E LHD with a duration of 127 minutes;
- Other factors which increased the risk included a revised lateral overlap ( $P_y(0)$ ) estimate and an increase in opposite direction vertical occupancy.



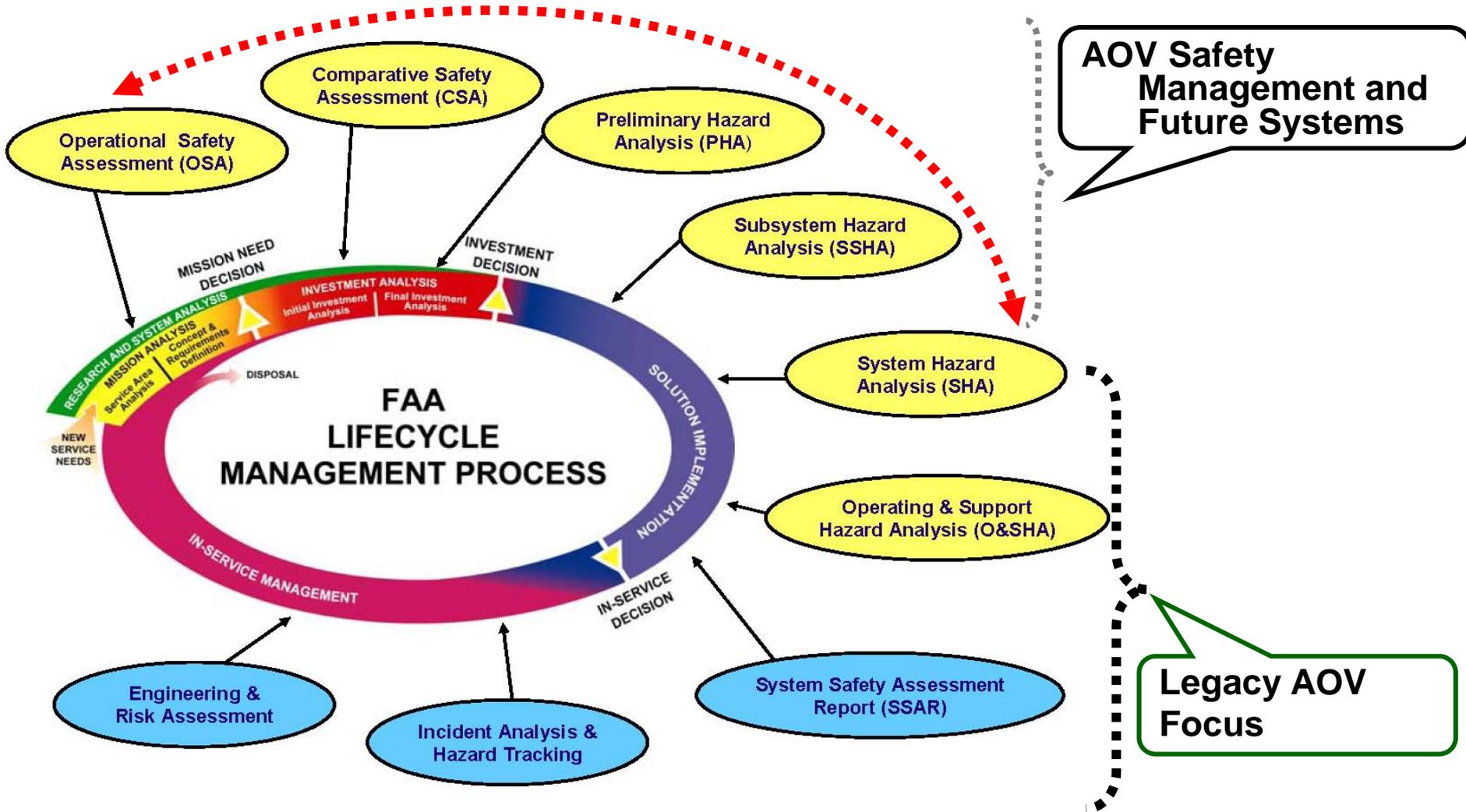
# Developing a Surveillance Program



# AMS Lifecycle – Safety Documentation



# FAA Example: Early and Often



# Points to Remember

- **Prior to SMS implementation, States must have the ability to:**
  - Implement regulations that address ICAO Annexes
  - Oversee their aviation industries
- **SMS is a dynamic system and as it evolves, there are learning opportunities**
- **No “one size fits all” for SMS**
  - No magic formula to fit every organization
  - Scalability is essential

Safety Management International Collaboration Group: How to Support a Successful SSP and SMS Implementation



# Useful Resources

- **Safety Management International Collaboration Group (SM ICG):**
  - 10 Things You Should Know About SMS
  - How to Support a Successful SSP and SMS Implementation – Recommendations for Regulators
  - SMS Inspector Competency Guidance
  - Measuring Safety Performance Guidelines for Service Providers

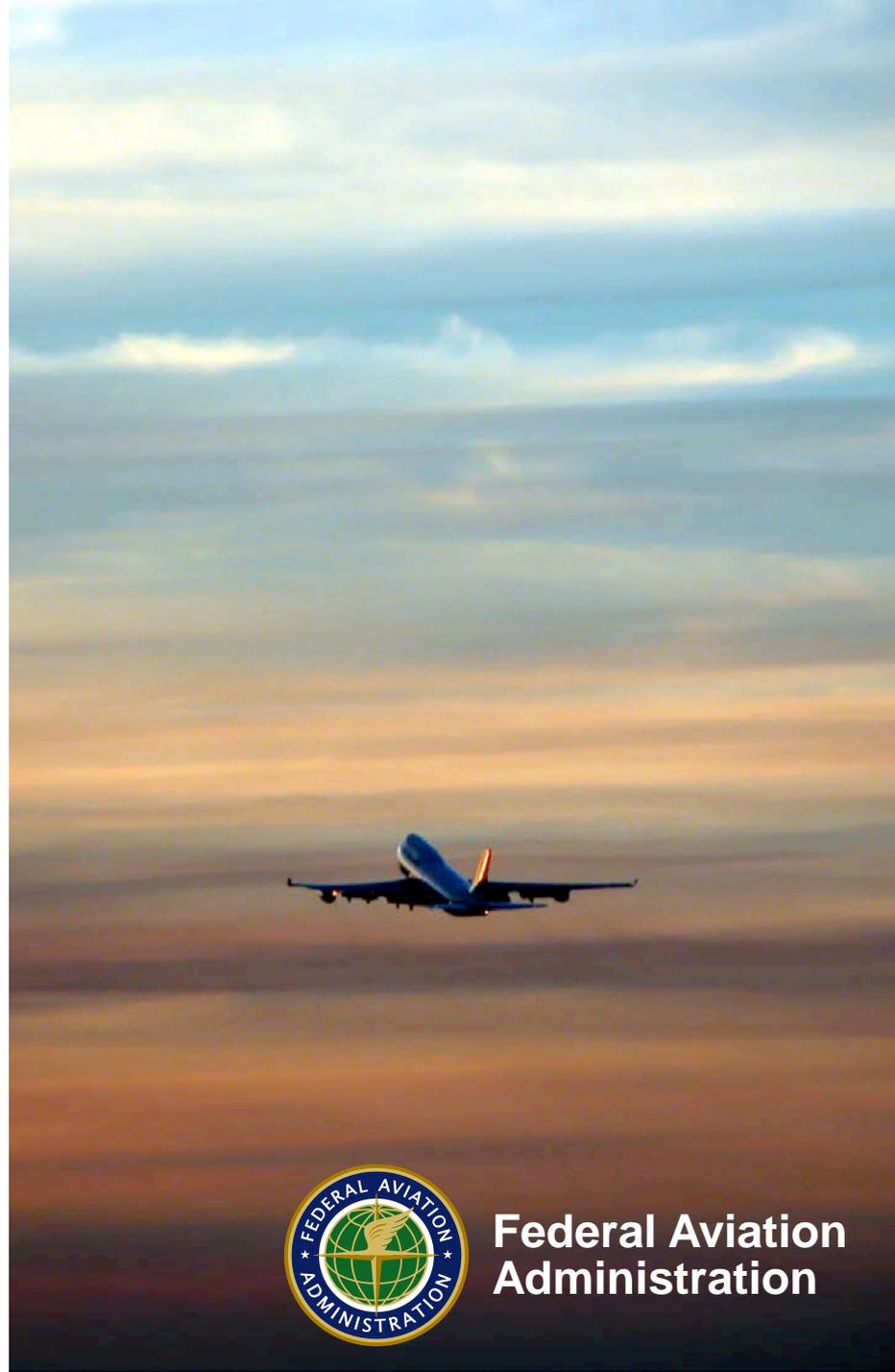


# Collaboration and Sharing of Safety Work

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By: Federal Aviation Administration  
Date: July 18, 2018



**Federal Aviation  
Administration**





**AIRCRAFT  
IN THE SKY AT  
ANY GIVEN TIME**

**7,000**



**5,000,000 SQUARE MILES  
OF UNITED STATES AIRSPACE**



**476**  
AIRPORT TRAFFIC  
CONTROL TOWERS



**197**  
TERMINAL  
RADAR  
APPROACH  
CONTROL  
FACILITIES



**21**  
AIR ROUTE TRAFFIC  
CONTROL CENTERS



**26,000,000 SQUARE MILES  
OF OCEANIC AIRSPACE**



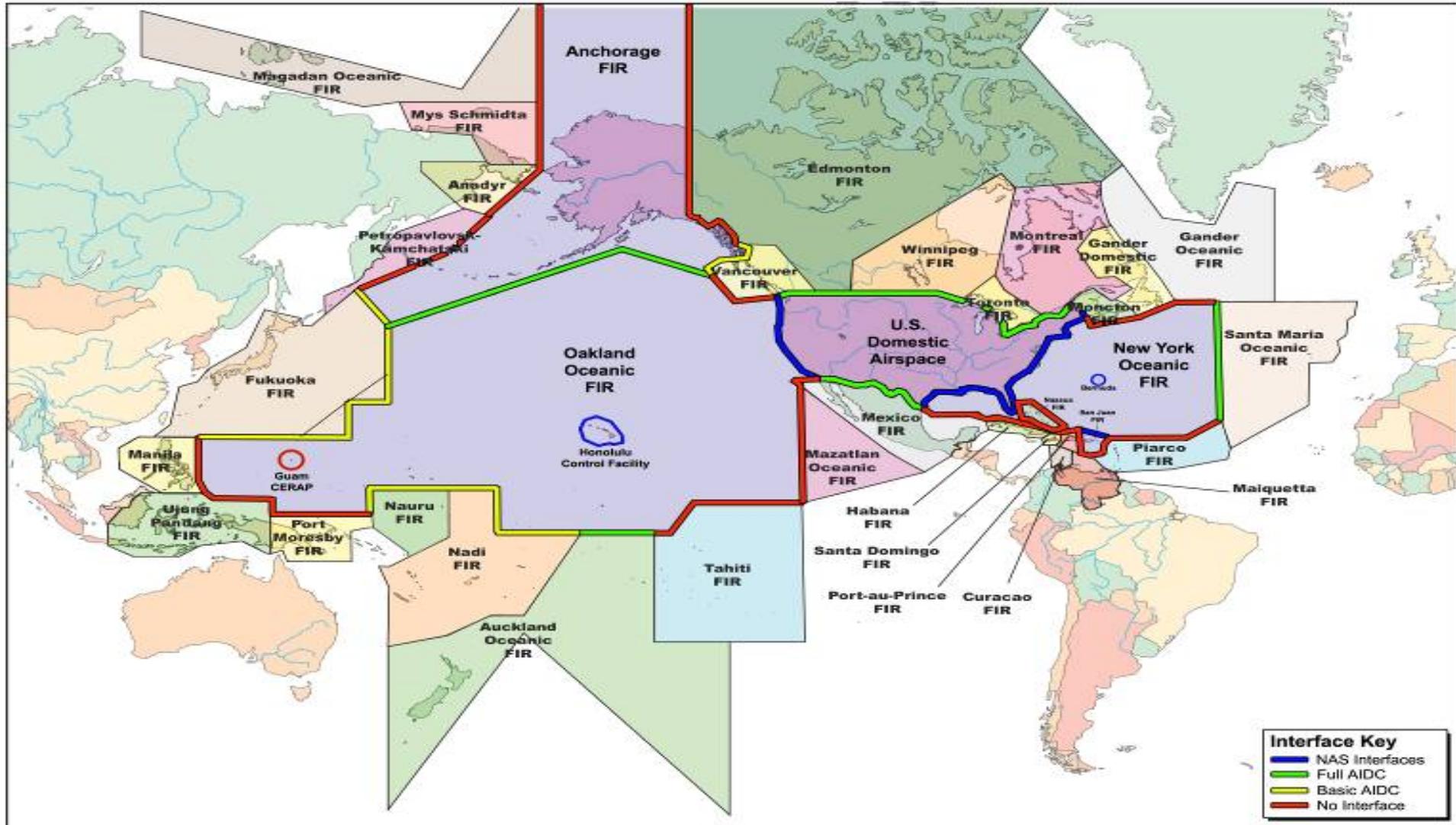
**8,727,691**  
COMMERCIAL FLIGHTS IN 2015



**14,000**  
AIR TRAFFIC  
CONTROLLERS



# FAA United States Managed International Airspace



# Why Collaboration?

- ANSPs are geographically isolated from each other and use different platforms in terms of technologies
- They provide services to significant numbers of customers
  - They often rely on secondary providers to provide services such as communication links via land lines or satellite



# Why Collaboration?

- Across the industry, ANSPs are at different stages of SMS development
  - Some have very mature systems which are fully integrated into the operations
  - Others are starting to build formalized safety management practices and a culture which assures the priority of safety
- ANSPs may find it difficult to:
  - Establish and maintain infrastructure necessary to provide services to large geographic areas

# Why Collaboration?

- State regulators are required to provide independent safety oversight of large service providers while at the same time keeping up with new international standards
- The ratio of government safety inspector : service provider personnel may be very low
- Regulators may find it difficult to:
  - Offer competitive compensation
  - Ensure expertise in all areas of ANS oversight



# Opportunities for Collaboration

- **Sharing of safety information and best practices**
- **Establishing standards and guidance material**
- **Setting and monitoring safety performance indicators**
- **Issuing licenses and approvals**
- **Resolving safety concerns**



# Improve Collaboration

- **Strategies to increase collaboration:**
  - Form SMS associations to share lessons learned, data and ideas
  - Participate in regional ICAO bodies and events
  - Participate in industry associations
  - Establish regular meetings between regulator and service provider(s) to discuss safety concerns
  - Promote a positive safety culture in the regulator and service provider(s)
  - Establish voluntary reporting programs



# FAA Example: Safety Council

- The **Safety Council** is a forum for senior management officials from the Air Traffic Safety Oversight Service (RB) and the Air Traffic Organization (SP) safety service
  - Consists of senior leaders from AOV and ATO
  - Meets monthly to discuss noncompliance and other safety issues



# FAA Contacts

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# Questions

