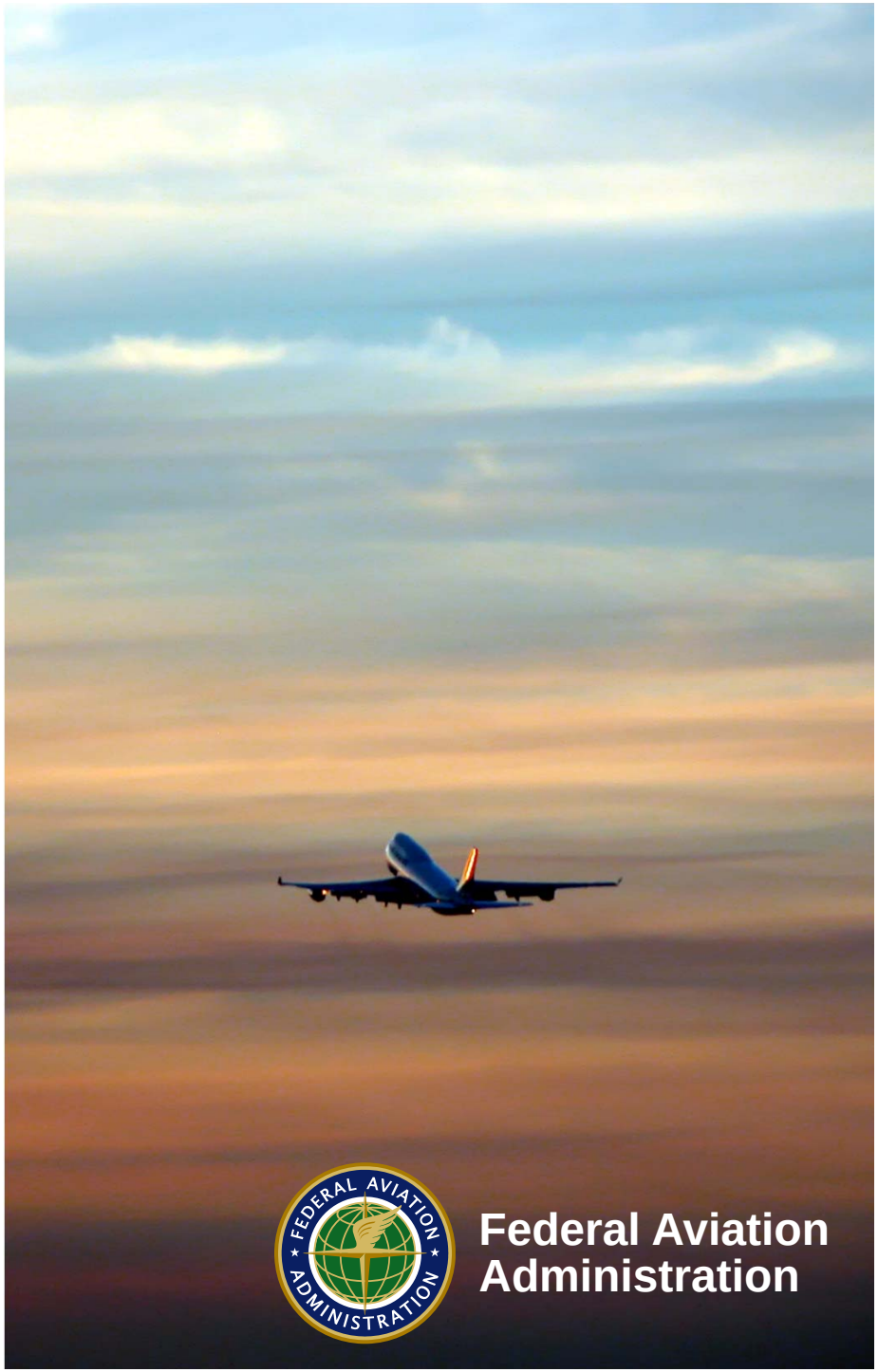
Annex 19 and the Independent Oversight of an ANSP's SMS

Presented to:	ICAO NACC Region
By:	Federal Aviation Administration
Date:	February 20-24, 2017



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

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

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

State Safety Management Responsibilities

- **The State's responsibilities for safety management include:**
  - Compliance with SARPs
  - Conducting State safety management functions
  - Surveillance of service provider SMS

The SSP Framework

- The SSP requires specific functions performed by States to support the safe and efficient delivery of aviation products and services under its authority
- The ICAO SSP framework includes four components:
  1. Safety policy and objectives
  2. Safety risk management
  3. Safety assurance
  4. Safety promotion
- Each of the four primary SSP components includes multiple sub-components

Strategies for Including Air Traffic Oversight in the SSP

- **Rely on existing State aviation structure to form the basis for the SSP**
- **Use the SSP to institutionalize the collection, analysis, and exchange of safety data for use by the State, and for the protection of safety information**
- **Summarize key requirements**
- **Describe relationships among organizations**
- **Cite authority when describing responsibilities (specific legislation, regulations, or directives)**
- **Attach appendices to explain frequently used acronyms and index related reference documents**

Focus Areas for Air Traffic Oversight

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

SMS Requirements

- **In addition to Annex 19, Annex 11 and Doc 4444 require States to:**
  - Implement systematic and appropriate safety management programs to ensure that their ATS systems achieve an acceptable level of safety
  - Establish such levels of safety and safety objectives for their air traffic services

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

Strategies to Oversee an SMS

- **Train personnel in SMS concepts before putting SMS regulations in place**
- **Establish requirements for service provider SMS in accordance with Annexes 11 and 19**
- **Require service providers to establish a safety service/focal point**
- **Establish a baseline**

Strategies to Oversee an SMS

- **Emphasize service provider compliance with the SMS**
- **Manage change by engaging early and often**
- **Build a collaborative approach to safety management**

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

Recommended SMS Competencies

- Working **understanding of management systems** to be able to evaluate how an organization ensures compliance with regulatory requirements on an on-going basis
- Understanding the **regulatory framework** and its intent to ensure an organization meets the requirements for its certificates
- Understanding of **SMS oversight techniques**
- Understanding how **organizational safety performance framework and indicators** are developed and used in a management system

Recommended SMS Competencies

- Understanding of the **different types of cultures** found in an organization and how they can affect the system performance
- Understanding **sensitivity of confidential issues** to prevent inadvertent disclosure of specific organizational data by the regulator
- **Communication skills** necessary to interface effectively between industry and internal stakeholders
- **Analytical skills** commensurate with roles and responsibilities to assess the organization's safety performance

Recommended SMS Competencies

- **Decision making skills** necessary to exercise judgment based on all available information
- **Open-mindedness**: To be able to accept new ideas or different viewpoints including being able to recognize that a management system is proportionate to the size and complexity of the organization
- **Systems thinking**: The ability to recognize the components of a system and how they interact and interface
- **Assertiveness**: The quality of being able to confidently and vigorously state and defend one's opinion

Recommended SMS Competencies

- **Teamwork**: SMS assessment is often carried out as part of a team so there is a need to be able to work in a multi-disciplinary environment in a cooperative manner
- Appreciation of the **subjectivity** of safety management and the need to establish **objective evidence** where possible
- Understanding of **human performance and limitations** and understanding of the organizational factors that may influence these
- **Understanding risk** to evaluate issues or proposed changes and the impact on the organization and the aviation system; and to evaluate the need for safety risk controls

The Competency Framework

- A **competency framework** defines the knowledge, skills, and attributes needed for various roles within an organization
  - Each individual role will have its own set of competencies needed to perform the job effectively
  - To develop SMS-related competencies, there needs to be an in-depth understanding of the roles within the organization

The Competency Framework

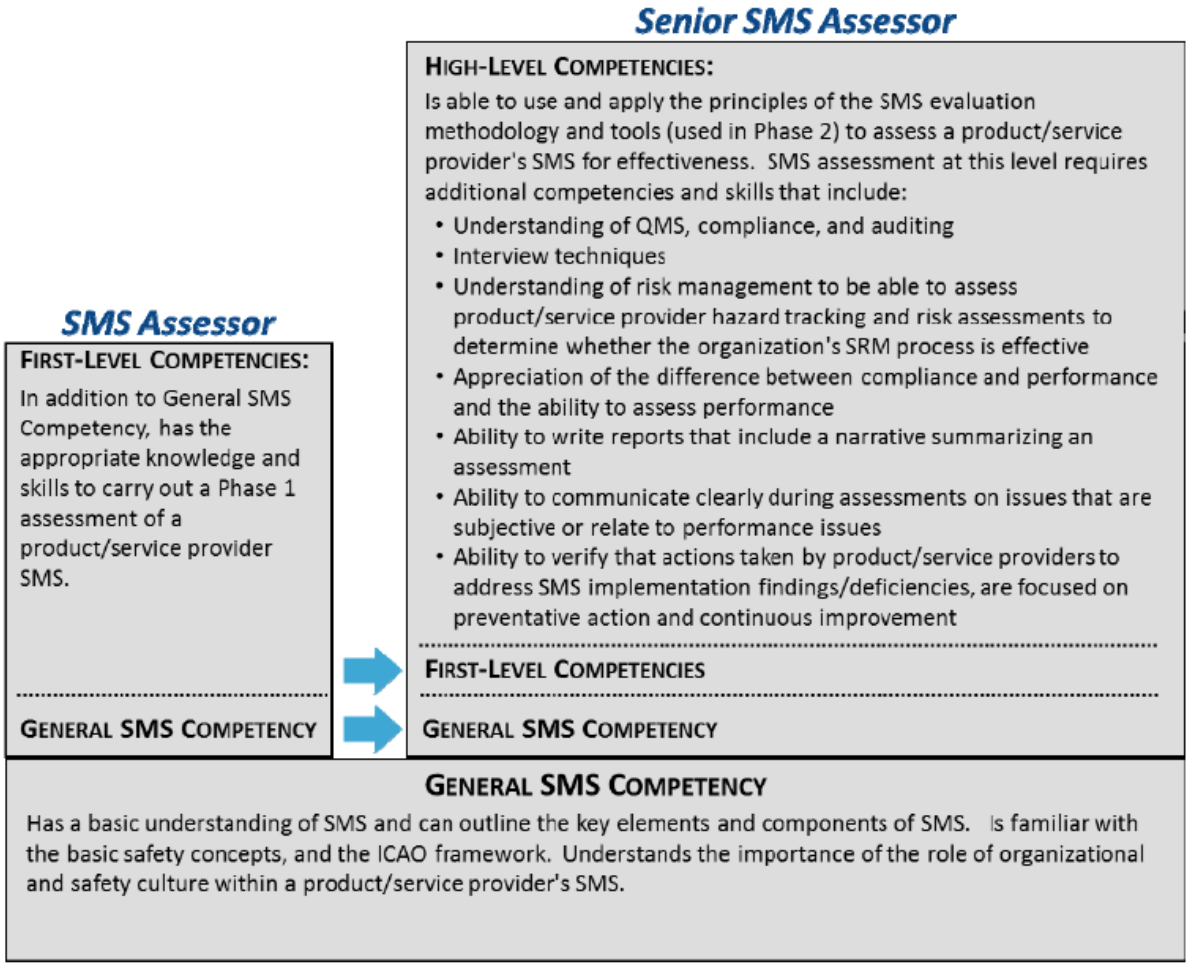
- To create a competency framework, regulators can:
  - Use a pre-set list of common, standard competencies, and then customize it to the specific needs of the organization
  - Create a general organizational framework, and use it as the structure for developing competencies

Competency Categorization

- **Competencies may have varying levels of detail**
  - Regulators may wish to group competencies into high-level groups and subgroups

SMS Core Competency	Competency Subgroup
1. **Working understanding of management systems** to be able to evaluate how an organization ensures compliance with regulatory requirements on an on-going basis	▪ Understands the role of the accountable manager (See SM ICG pamphlet, *The Senior Manager's Role in SMS*). ▪ Understanding of basic components of a management system. ▪ Understands the need for management system components to be integrated and operate as one system. ▪ Recognizes whether management systems are appropriate for the type, size and operating environment of the organization. ▪ Understanding of change management principles. ▪ Understanding of best practices for continuous improvement.

Levels of Proficiency[1]



[1] SM ICG, adapted from draft UK CAA Safety Management Competencies

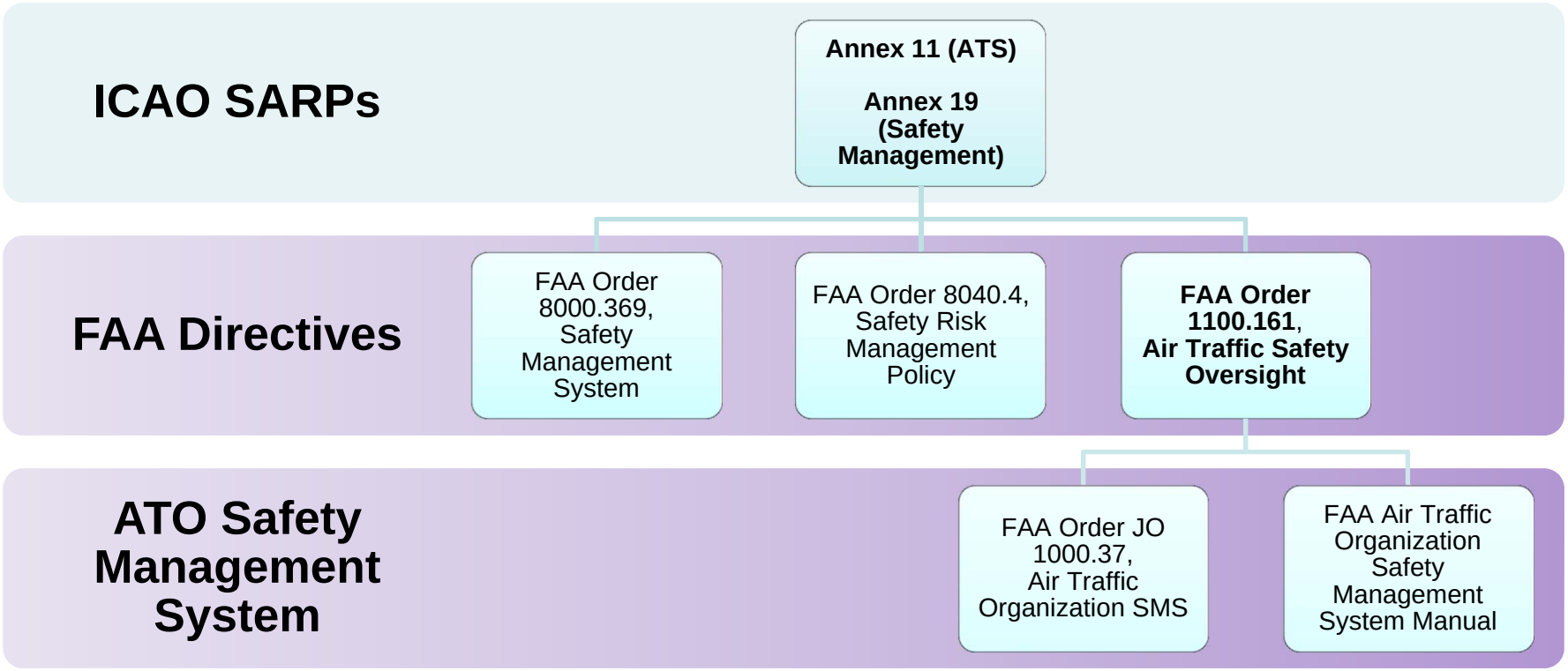
Establish Requirements

- **Ensure clear line-of-sight to international standards**
  - Ensure that requirements reflect safety objectives contained in Annexes 11 and 19
- **Consult with service providers from the beginning of the drafting process on the regulations and standards that relate to implementing an SMS**
  - Revise requirements as needed to reflect dynamic and evolving SMS
- **Develop generic safety management regulations**
  - Avoid changing multiple regulations

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

FAA Example: SMS Policy



ANSP Safety Organization

- **A dedicated safety unit within the service provider can:**
  - Establish safety policy
  - Identify and mitigate risk
  - Manage and standardize Quality Assurance and Quality Control activities
  - Enhance safety culture
  - Be a focal point for coordination with the regulator/oversight authority

FAA Example: ATO Safety

- The **Safety and Technical Training Service Unit** in the FAA Air Traffic Organization (SP) supports operations with safety and quality management systems
- **ATO Safety:**
  - Develops and manages the ATO Safety Strategy
  - Promotes a safety culture and safety concepts within the ATO
  - Publishes an annual Safety Report
  - Serves as the Air Traffic Safety Oversight Service's (RB) primary liaison to the ATO (SP)

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

Compliance

- **Surveillance methodology should be:**
  - Performance-based
    - Does it allow you to effectively evaluate an SMS within its operating context?
    - Does it assess for compliance only or does it also assess the performance and effectiveness of the SMS?
  - Risk-based
    - Applicable to individual or groups of service providers, based on risk profiles

FAA Example: The ATO SMS

- **The Air Traffic Safety Oversight Service (AOV – RB) has the following responsibilities regarding the Air Traffic Organization (ATO – ANSP) SMS:**
  - Establish the requirements for the ATO SMS in accordance with Annexes 11 and 19
  - Approve the SMS manual and any changes to the SMS manual
  - Monitor ATO compliance with the SMS
  - Approve controls that are defined to mitigate or eliminate initial or current high-risk hazards

FAA Example: The ATO SMS

- **Compliance includes:**
  - Requiring the ATO to provide reporting, as requested, of the status of the SMS, including information on safety occurrences/data
  - Access to any and all records in ATO that AOV believes are useful in determining ATO compliance with the SMS
  - Monitoring corrective actions taken by ATO to assure resolution of identified safety hazards
  - Routine surveillance, such as audits and inspections

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

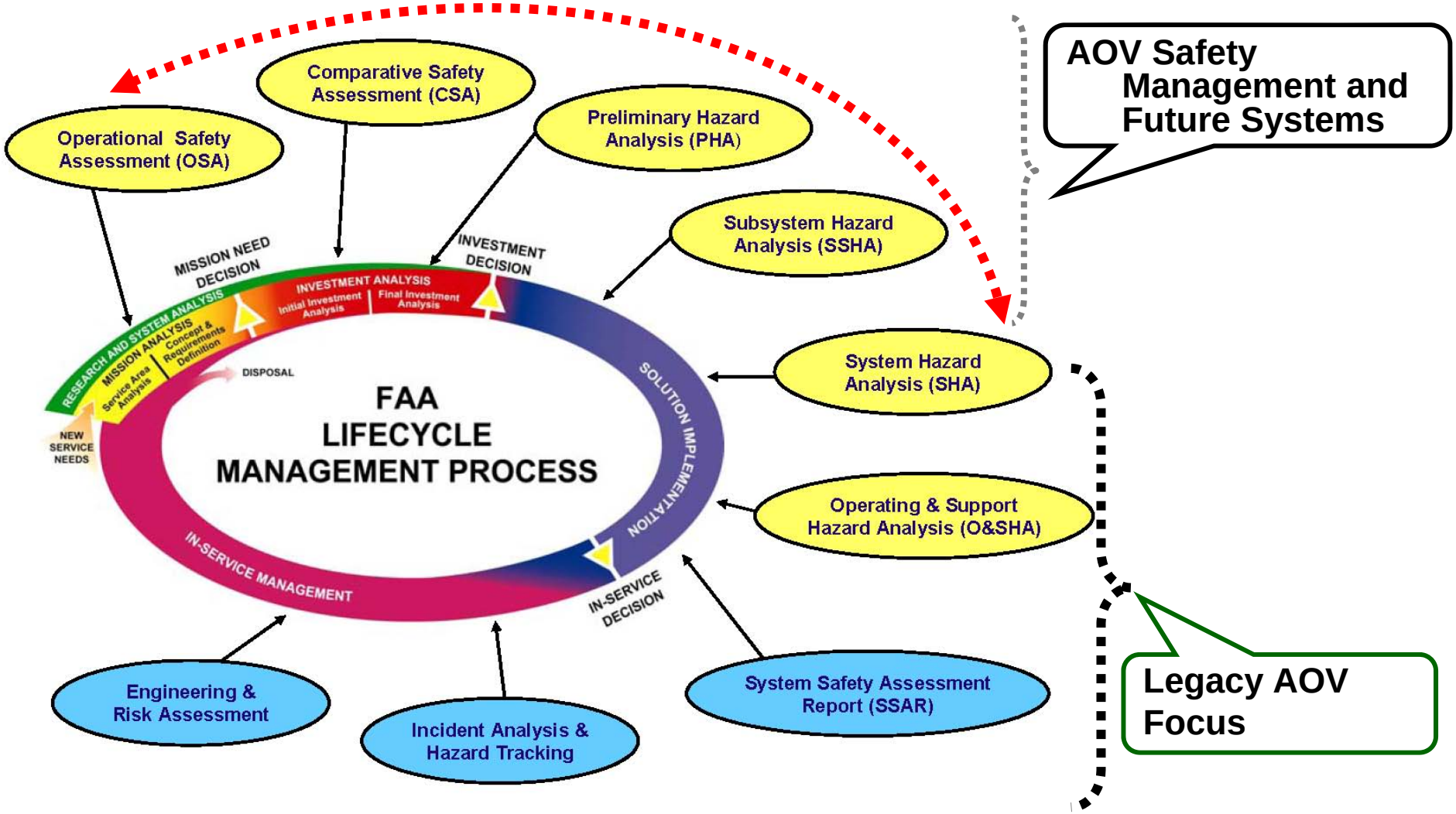
FAA Example: The ATO SMS

- **The ATO (SP) has the following responsibilities regarding the SMS:**
  - Develop and use a formal, documented methodology for conducting safety risk assessments that is tailored to the scope and timeliness of the planned change
    - Planned changes must apply safety risk assessment techniques before ATO can implement changes
    - ATO must conduct risk assessments in accordance with the provisions of the SMS manual

Managing Change

- **Decisions to acquire or implement new systems must be made in accordance with the service provider's SMS manual**
- **The regulator may also engage in the service provider's acquisitions process**
  - This involvement benefits both the regulator and the ANSP(s)

FAA Example: Early and Often



Collaborative Approach

- **Work with service providers to reach agreement on providers' safety performance**
  - Establish reasonable targets, objectives, and expectations
  - Develop and review the relevance of safety performance indicators (SPIs) in conjunction with service providers
    - Strive for consensus
    - Use service provider data to validate SPIs

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

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
- **CANSO Standard of Excellence in Safety Management Systems**

References

- **ICAO Safety Management Manual**
- **FAA Order 1100.161**
- **FAA Safety Oversight Circular 07-01**

Collaboration and Sharing of Safety Work

Presented to: ICAO NACC Region

By: Federal Aviation Administration

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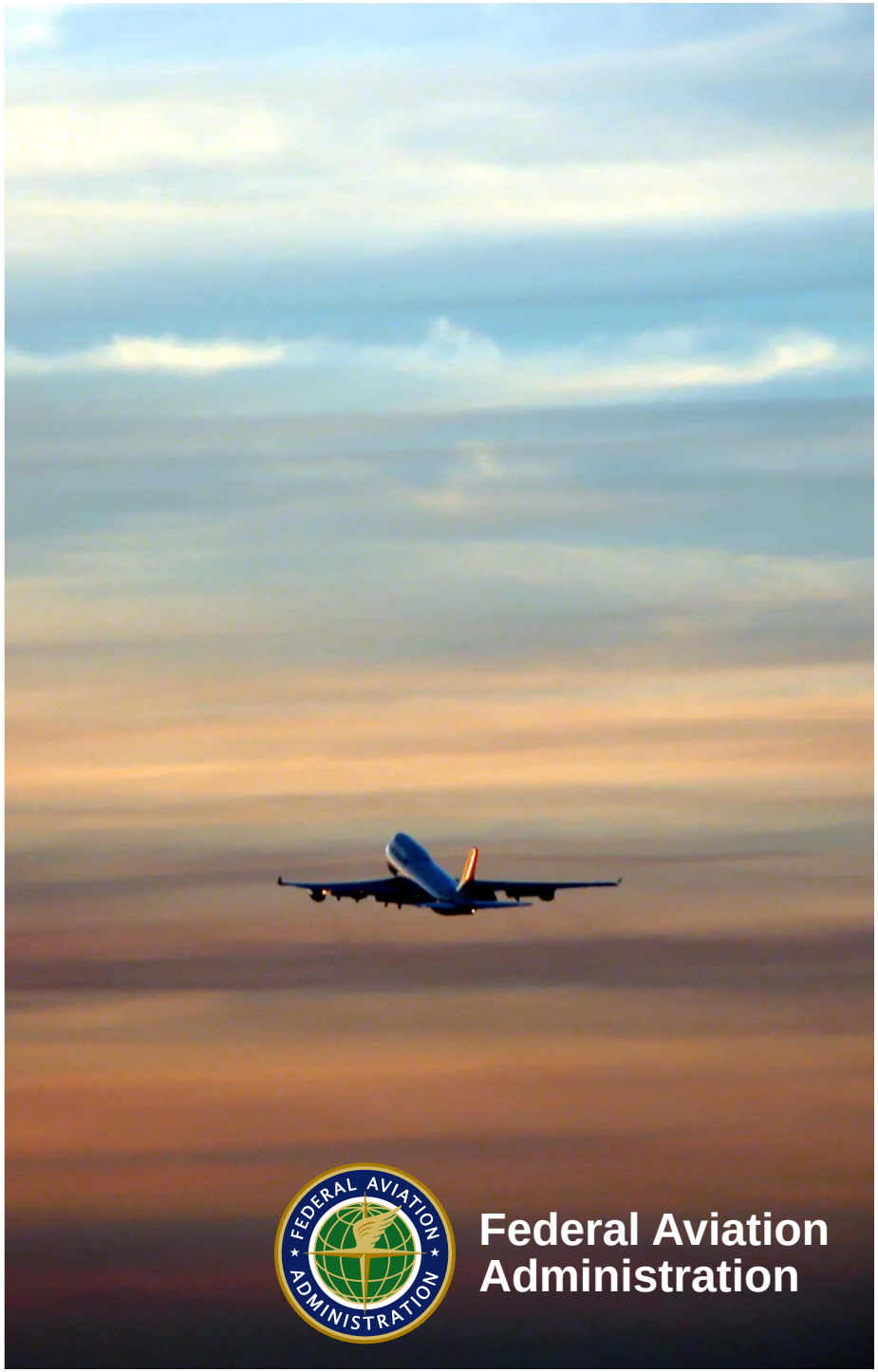
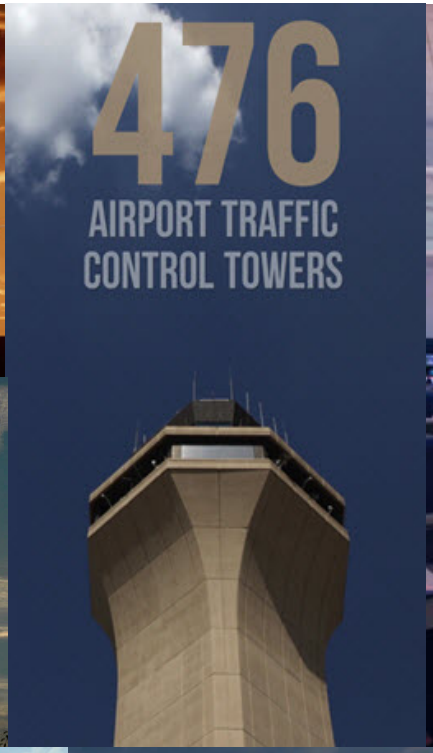


AIRCRAFT
IN THE SKY AT
ANY GIVEN TIME
7,000

5,000,000 SQUARE MILES
OF UNITED STATES AIRSPACE


476
AIRPORT TRAFFIC
CONTROL TOWERS

197
TERMINAL
RADAR
APPROACH
CONTROL
FACILITIES

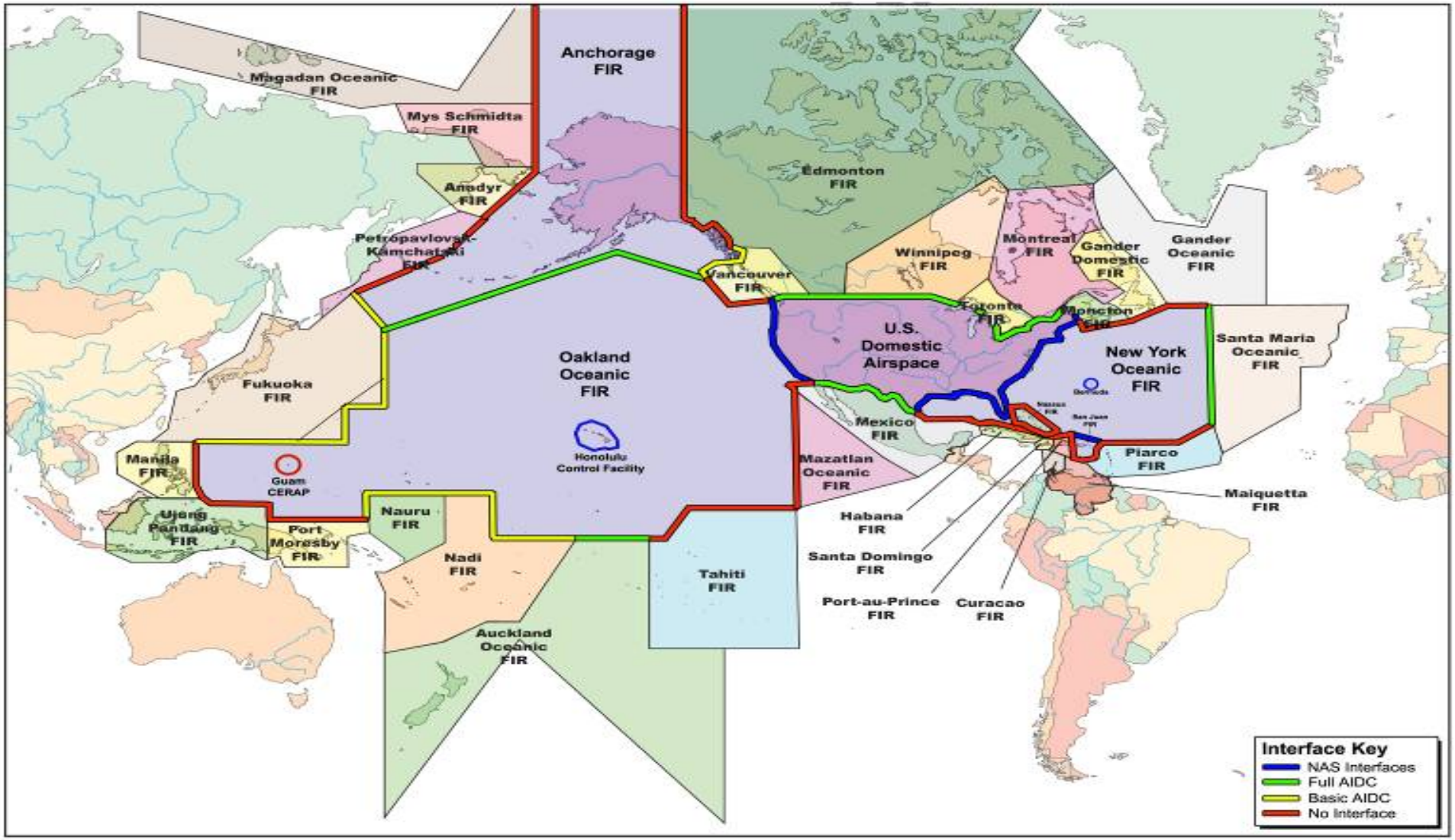
21
AIR ROUTE TRAFFIC
CONTROL CENTERS

14,000
AIR TRAFFIC
CONTROLLERS

26,000,000 SQUARE MILES
OF OCEANIC AIRSPACE

8,727,691
COMMERCIAL FLIGHTS IN 2015

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
  - Meets monthly to discuss noncompliance and other safety issues

Collaboration in the North Atlantic

The North Atlantic Region agreed to and uses the following indicators for oceanic airspace:

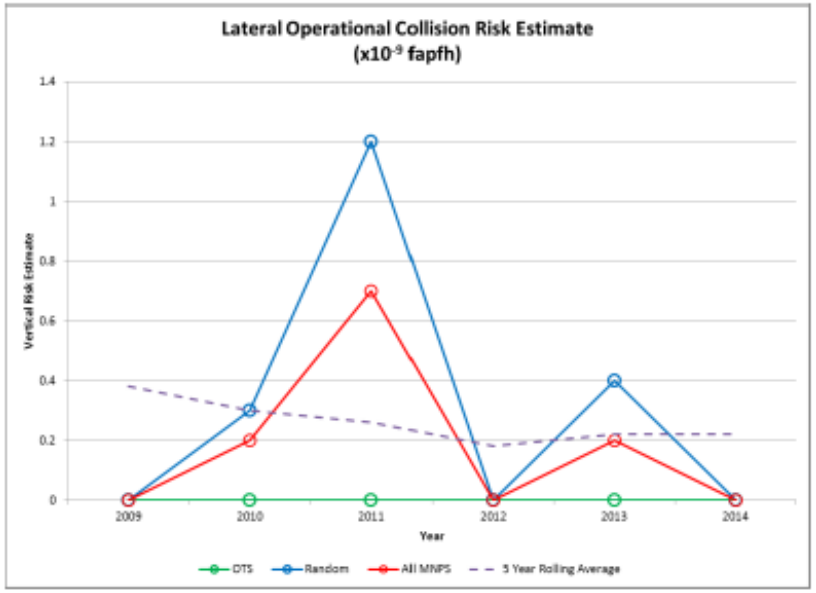
1. Number of accidents
2. Number of fatalities
3. Number of LHD events
4. Number of long duration LHD events
5. Number of GNE events
6. Number of losses of separation (vertical)
7. Number of losses of separation (lateral)

Collaboration in the North Atlantic

NAT MWG/51 Static Dashboard

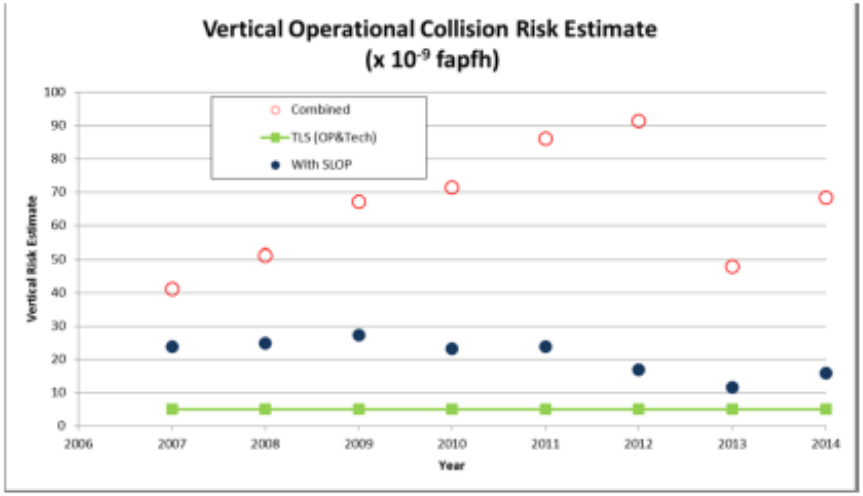
Lateral Risk:

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



Vertical Risk:

- 68.3 x 10^{-9} fapfh. Increase of 42% from 2013;
- 15.9 x 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.



Air Traffic Safety Oversight Self-Assessment and Action Plan

Presented to: ICAO NACC Region

By: Federal Aviation Administration

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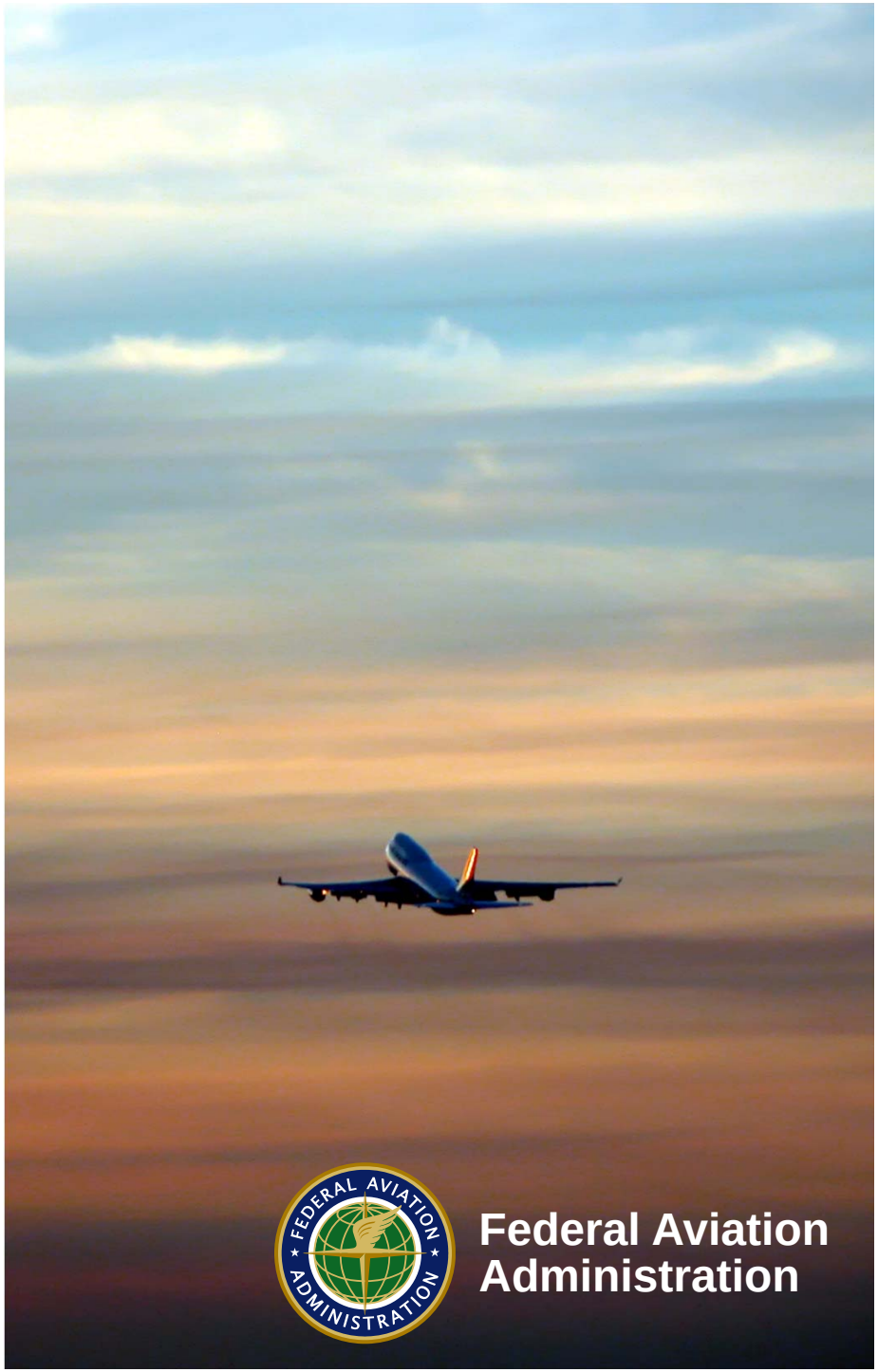


Activity

SELF-ASSESSMENT…

Objectives

- **Review knowledge of your organization's capabilities for safety management**
- **Identify gaps in key information and focus on key performance requirements and results**
  - If you identify topics for which conflicting, little, or no information is available, use these topics for future action planning

Activity Instructions

- **Access the Self-Assessment Worksheet file**
- **Work individually or in small groups representing your organizations**
- **Type your responses into the Worksheet**

Discussion

- **Do you think that this self-assessment will help your organization carry out its safety management responsibilities going forward?**
- **If you represent an ANSP, did this activity help you to understand regulatory requirements?**
  - Might it help you to improve your SMS processes?

Activity

Air Traffic Safety Action Plan…

Objectives

- **Develop an action plan to address at least one of the gaps identified in your Air Traffic Safety Oversight Self-Assessment**
  - Prioritize gaps to determine the most important focus area(s) for the plan

What is an Action Plan?

- An **action plan** is a sequence of steps that must be taken, or activities that must be performed well, for a strategy to succeed[1]
- **An action plan has three key elements:**
  - Specific tasks
    - What will be done and by whom?
  - Time horizon
    - When will it be done?
  - Resource allocation
    - What will you need to do it?

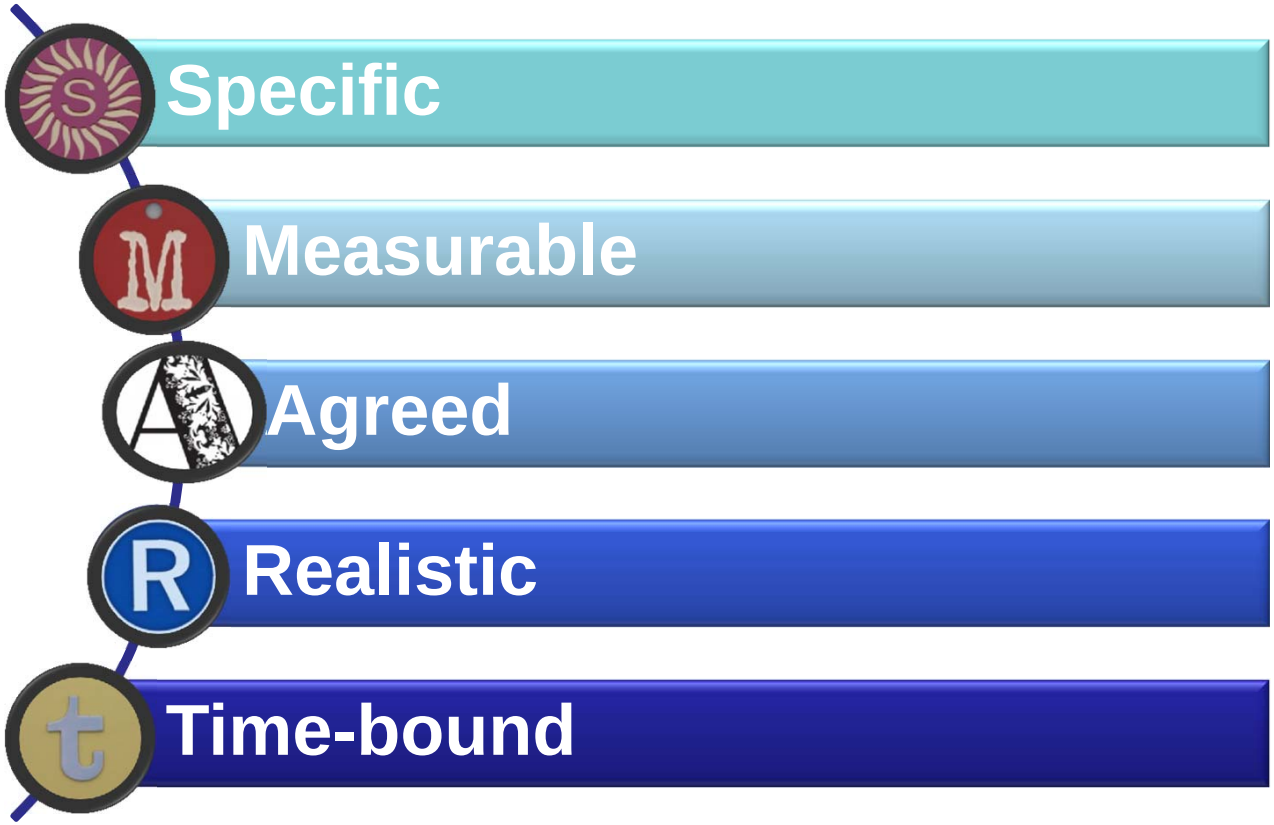
[1] Action Plan (http://www.businessdictionary.com/definition/action-plan.html)

Steps to Successful Action Plans

- **State the problem and desired outcome**
  - Be mindful of project scope
- **Identify a responsible person**
  - Who will be responsible for the plan?
  - Who will be responsible for specific tasks?
- **Set SMART targets**
- **Use SCHEMES to review and double-check the plan**
  - Successful plans are clear and comprehensive
- **Update plans regularly**
  - Action plans are not static!

SMART Targets

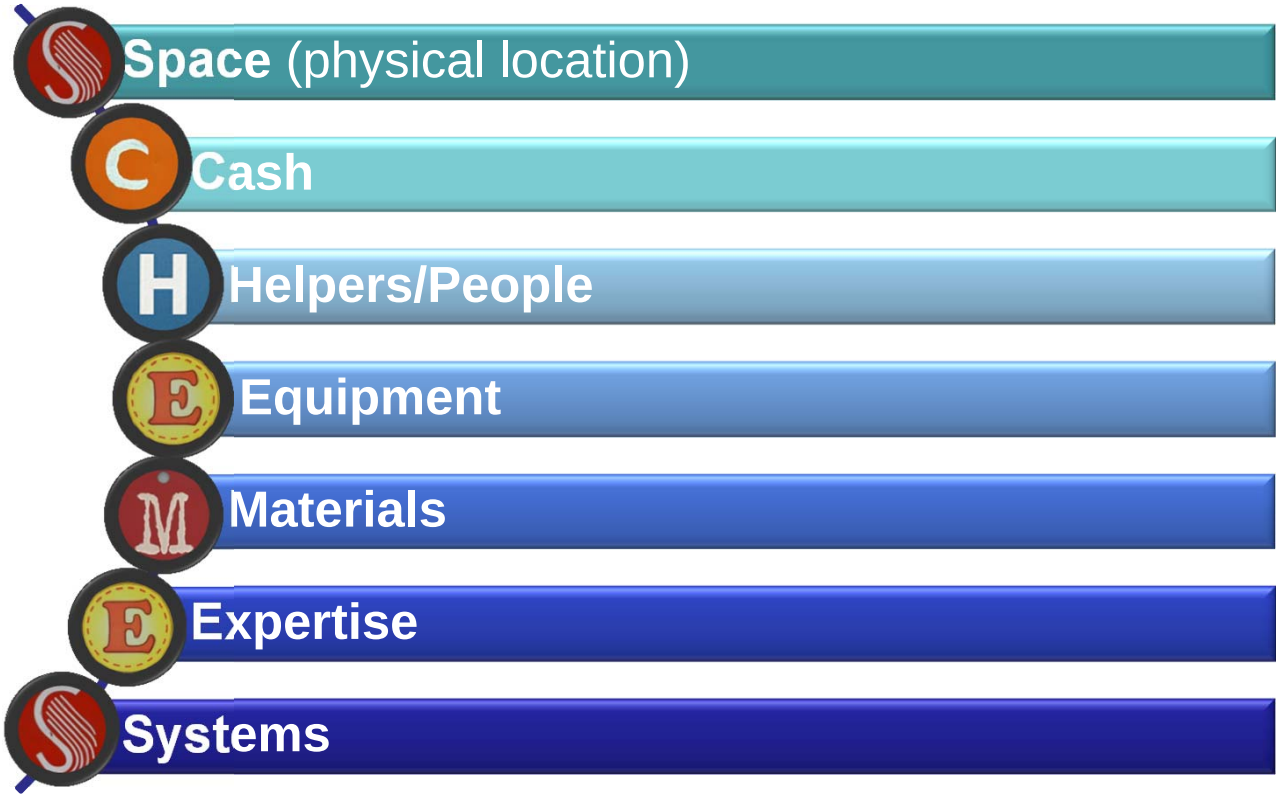
- **SMART targets are:**



SMART Goals, by Duncan Haughey, PMP (http://www.projectsmart.co.uk/smart-goals.php)

SCHEMES

- **Use SCHEMES[1] to double-check that your plan is comprehensive:**



[1] Action Plans, Small Scale Planning (http://www.mindtools.com/pages/article/newHTE_04.htm)

Workshop Instructions

- **Access the Air Traffic Safety Oversight Action Plan file**
- **Work individually or in small groups representing your organizations**
- **Type your responses into the Plan**

Discussion

- **How long will it take to complete your plan?**
- **What did you learn from developing your action plan?**

Presentation of Certificates

Closing Remarks

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