Critical Element 8
Resolution of Safety Concerns

- **Critical Element 8 includes:**
  - The implementation of processes and procedures to resolve identified deficiencies impacting aviation safety, which may have been residing in the aviation system and have been detected by the regulatory authority or other appropriate bodies.
  - This includes the ability to analyze safety deficiencies, forward recommendations, support the resolution of identified deficiencies, as well as take enforcement action when appropriate.

CE-8: USOAP PQs

Has the State established and implemented a mechanism/system:

- **For the review and elimination of deficiencies identified within the framework of the Planning and Implementation Regional Groups (PIRGs)? (7.045)**
- **For reporting and following up air traffic incidents? (7.187)**

CE-8: USOAP PQs

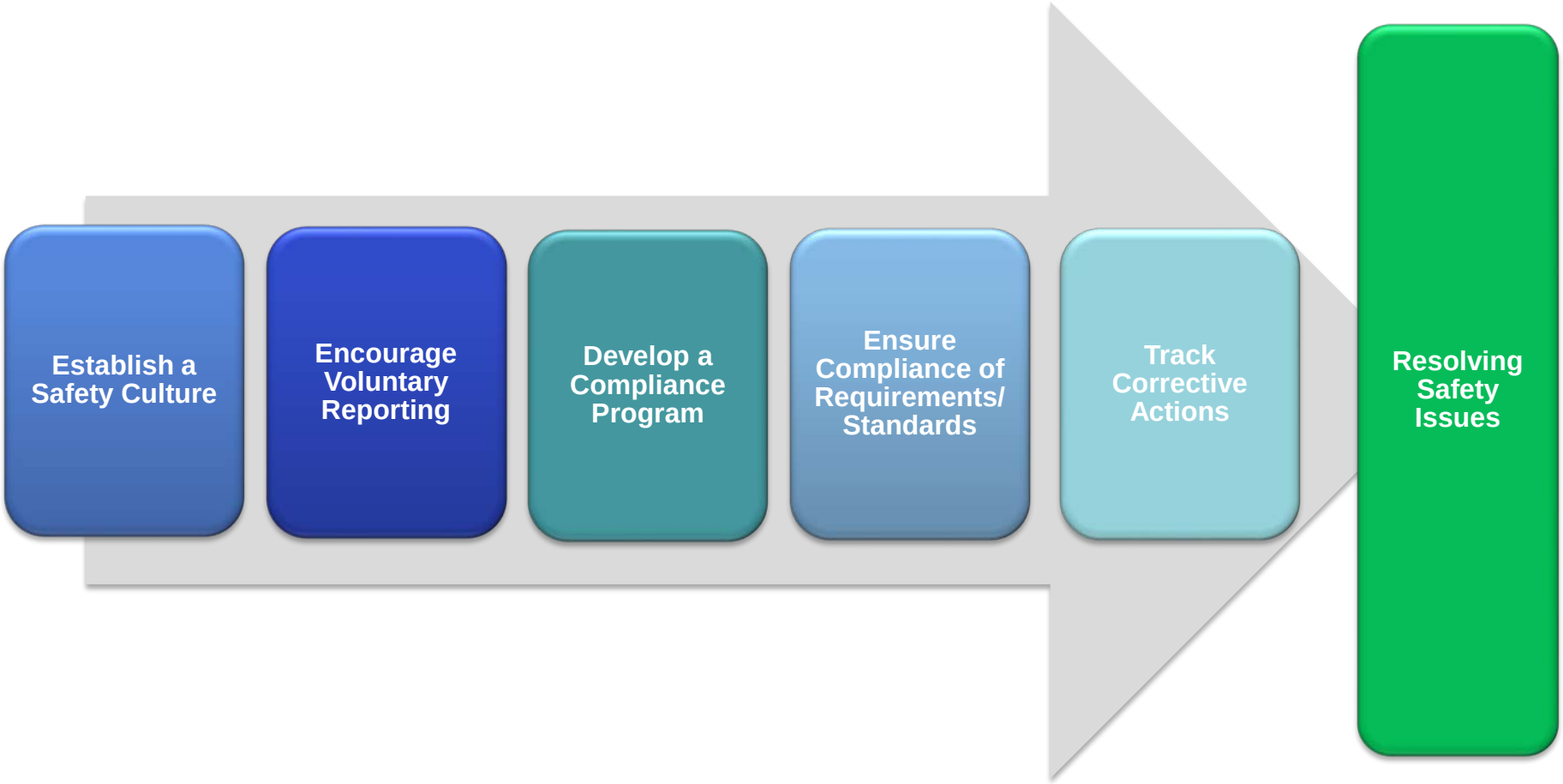
Has the State established and implemented a mechanism/system with time frame for the elimination of deficiencies identified by:

- **PANS-OPS inspectors? (7.233)**
- **AIS inspectors? (7.289)**
- **Cartographic inspectors? (7.345)**
- **CNS inspectors? (7.395)**
- **MET inspectors? (7.437)**
- **SAR inspectors? (7.507)**

Applying CE8 to Air Traffic Oversight

- **A compliance and enforcement program should:**
  - Document identification and resolution of issues
  - Prioritize safety issues according to risk
  - Include timelines for immediate corrective action to be taken and mitigate a safety concern
  - Target repeated safety issues
  - Identify patterns of weakness or deficiency
  - Be transparent to the service provider(s)

Applying CE8 to Air Traffic Oversight



Encouraging Safety Culture

Encouraging Safety Culture

- **Safety culture** is the way safety is perceived, valued, and prioritized
  - Reflects the real commitment to safety at all levels in the organization
- Safety culture is important to regulators *and* ANSPs
- Safety culture can be *positive*, *negative*, or *neutral*

SKYbrary: Category: Safety Culture (http://www.skybrary.aero/index.php/Category:Safety_Culture)

Positive Safety Culture

Reporting

- Encourages employees to divulge information about all safety hazards they encounter

Just

- Holds employees accountable for deliberate violations of the rules but encourages and rewards them for providing essential safety-related information

Flexible

- Adapts effectively to changing demands and allows quicker, smoother reactions to off-nominal events

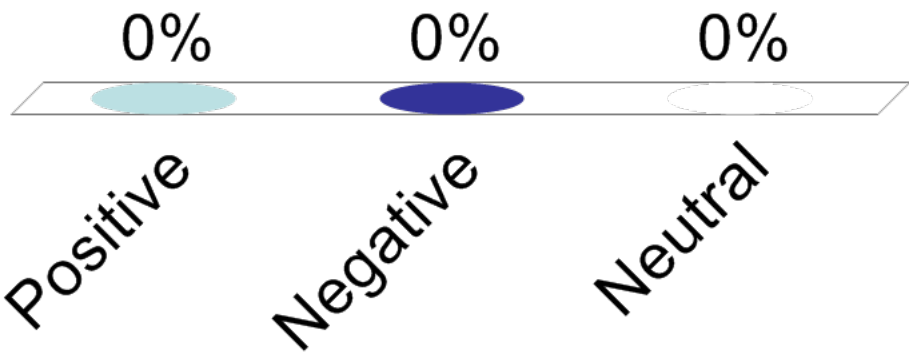
Learning

- Willing to change based on safety indicators and hazards uncovered through assessments, data, and incidents

James Reason, Managing the Risks of Organizational Accidents, Hants: Ashgate, 1997, p. 196)

Do you feel that your organization has a positive, negative or neutral safety culture?

A. Positive
B. Negative
C. Neutral



Encouraging Safety Culture

- **To develop a positive safety culture:**
  - Understand the concept of safety culture
  - Measure safety culture
  - Improve safety culture

SKYbrary: Toolkit: Safety Culture (http://www.skybrary.aero/index.php/Solutions:Safety_Culture)

Measuring Safety Culture

- **Conduct a safety culture assessment to:**
  - Establish a shared understanding of the organization's (CAA or ANSP) safety culture and identify its strengths and weaknesses
- **The safety culture assessment process includes:**
  - Pre-launch phase
  - Data collection
    - Safety culture questionnaire, interviews, workshops
  - Safety culture analysis
  - Diagnosis, feedback, and way forward

SKYbrary: Toolkit: Safety Culture, B1.1 How do you measure safety culture? (http://www.skybrary.aero/index.php/Solutions:Safety_Culture)

Strategies for conducting a safety culture assessment

- Collaborate with an external, independent assessment team of experts
- Appoint an internal “champion”
- Seek staff contribution and involvement

SKYbrary: Toolkit: Safety Culture, B1.2 and B1.3 (http://www.skybrary.aero/index.php/Solutions:Safety_Culture)

Safety Culture Questionnaire

Example safety culture questions

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
1. Appropriate responses are made after an incident to address the reasons why the incident occurred.	1	2	3	4	5
2. Everyone at my Unit feels that safety is their own responsibility - there is proactive participation by all staff in safety initiatives.	1	2	3	4	5
3. People who raise problems are seen as trouble-makers.	1	2	3	4	5
4. Even if the system fails, we are still expected to achieve the targets that are set for us.	1	2	3	4	5
5. The organization says "it is committed to safety" but actually has other higher priorities.	1	2	3	4	5
6. Only my manager has responsibility for safety.	1	2	3	4	5

Safety Culture in Air Traffic Management: A White Paper; FAA/EUROCONTROL AP 15

Measuring Safety Culture

- **Positive safety culture should be reflected the following:**
  - Organizational website
  - Documented policies and procedures
  - Safety programs and safety initiatives
  - Internal publications (organization structure, mission statement, etc.)
  - Incident reports
    - How often voluntary reporting processes are used
    - Quality and scope of incident reports, and whether important issues are covered appropriately
    - Whether reports are acted on, how feedback is communicated, and what the process for responding to reports entails
    - How trends in incident data are collected and acted upon

SKYbrary: Assessing Safety Culture in ATM (http://www.skybrary.aero/index.php/Assessing_Safety_Culture_in_ATM#Data_Collection:_The_Safety_Culture_Questionnaire)

FAA Example: Service Provider Website

Voluntary Safety Reporting Programs
Safety and Technical Training

ATO's Voluntary Safety Reporting Programs are modeled after the very successful Aviation Safety Action Programs (ASAPs) used in the aviation industry. Over sixty-nine (69) aviation companies have operating ASAP programs. ASAP can be traced back to the early 1970s and a voluntary safety reporting program at United Airlines.

These programs use employee input to identify significant safety concerns and issues; operational deficiencies; non-compliance with regulations; deviations from company policies and procedures; and unusual safety events. Voluntary safety reporting programs, such as ATSAP and T-SAP, are part of a positive, vibrant, safety culture.

Voluntary Safety Reporting Program for Air Traffic Controllers

- Air Traffic Safety Action Program (ATSAP)

Voluntary Safety Reporting Program for Region X Employees

- ATSAP-X

Voluntary Safety Reporting Program from Technicians

- Technical Operations Safety Action Program (T-SAP)

Voluntary Safety Reporting Program for Federal Contract Towers

- SAFER-FCT

Improving Safety Culture

- **A safety culture assessment may suggest specific opportunities for improvement**
- **The following practices also support a positive safety culture:**
  - Encourage open discussion of safety concerns among staff and management
  - Establish and foster voluntary safety reporting programs

Strategies for managing culture change

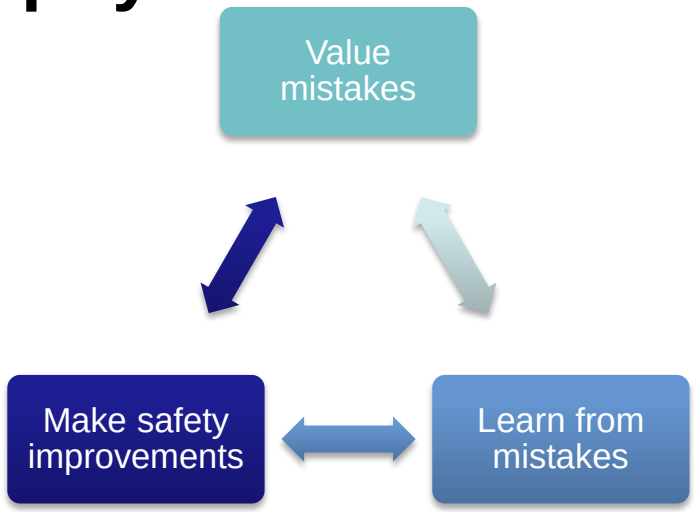
- Establish commitment to improving safety culture at all levels of the organization
- Set up monitoring processes (for resources, objectives, implementation, timelines)
- Report progress and communicate achievements
- Celebrate success

SKYbrary: Toolkit: Safety Culture, C1.3 Planning for safety culture change (http://www.skybrary.aero/index.php/Solutions:Safety_Culture)

Encourage Voluntary Reporting

Encourage Voluntary Reporting

- **Voluntary safety reporting programs are a component of a positive safety culture**
  - Non-punitive
- **Voluntary reporting philosophy:**
  - Value mistakes
  - Learn from mistakes
  - Make safety improvements



Encourage Voluntary Reporting

- **Successful voluntary safety reporting programs require:**
  - Incentives to report
    - Limited immunity from enforcement and/or disciplinary actions
  - Legal protection of identities and reported information (de-identification)
  - Collaboration between regulator and service provider(s)
    - Agreement on terms and conditions to be upheld by each party
  - Dedicated program manager
  - Documented process for report handling and analysis
  - Resolution of identified safety issues
  - Data-sharing processes to provide access to safety information gathered by the program(s)

Why Voluntary Reporting?

- **FAA (regulatory) perspective:**
  - Many accident precursors do not entail noncompliance with regulations/requirements
  - Access to safety information not otherwise known
  - Incentive to exceed minimum standards
  - Additional means of achieving corrective action
  - Improve the ability to ensure future compliance

Acceptable Reports

- **Voluntary reporting programs do not tolerate intentionally reckless or criminal behavior**
- **Acceptable reports:**
  - Must be inadvertent
  - Must *not* involve gross negligence (that is, the individual did not intentionally introduce risk)
  - Must *not* appear to involve criminal activity
  - Must *not* appear to involve substance abuse, controlled substances, or alcohol
  - Must *not* appear to involve intentional falsification

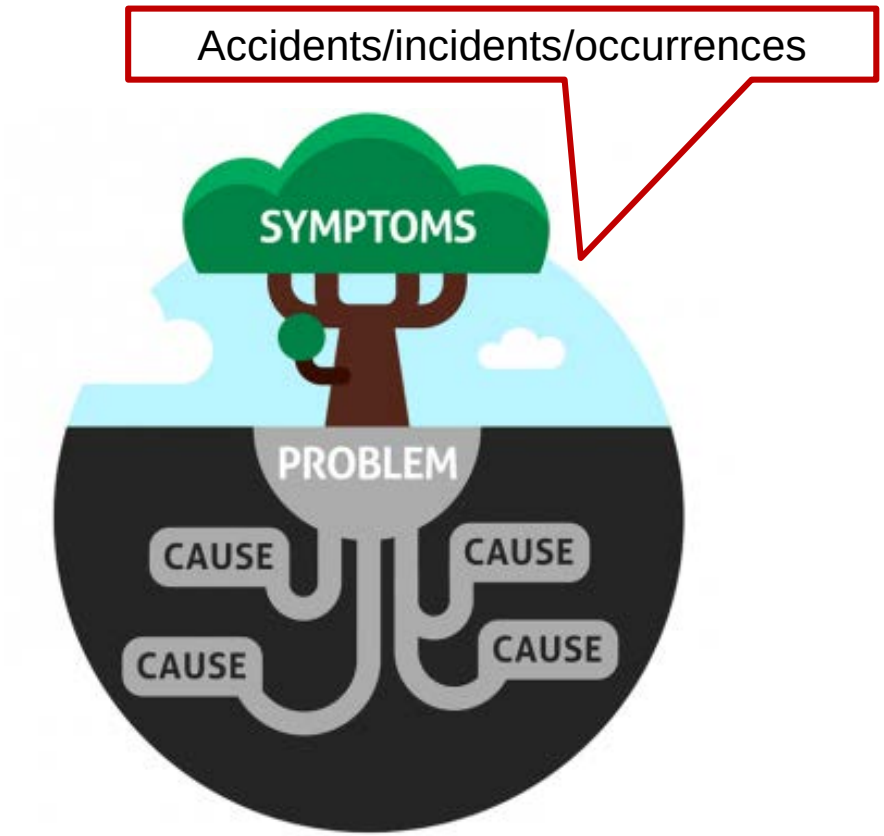
FAA Voluntary Reporting Tools

FAA Example: Protecting Safety Information

- **Limitations on disclosure of safety information are contained in U.S. statutes and regulations**
  - 49 U.S. Code § 44735: Limitation on Disclosure of Safety Information
  - Title 14 of the Code of Federal Regulations
    - Part 91.25 – Aviation Safety Reporting Program: Prohibition Against use of Reports for Enforcement Purposes
    - Part 193 – Protection from Release of Voluntarily Submitted Safety Related Information
      - FAA ATSAP and T-SAP reports protected under Part 193
    - Part 13.401 – Flight Operational Quality Assurance Program: Prohibition against use of data for enforcement purposes

Root Cause Analysis

- **Root cause analysis** is a deductive method used to analyze a problem, identify its causes and the measures that could be taken to prevent it from occurring again
  - Symptoms of the problem may be visible but you are unable to see and identify the causes
- Voluntary safety reports support root cause analysis



Using Root Cause Analysis to Drive Process Improvement (http://intland.com/blog/safety-engineering/using-root-cause-analysis-to-drive-process-improvement/)

FAA Example: Event Review

- An **Event Review Committee (ERC)** determines the appropriate response for each voluntary safety report
  - Reviews and analyzes the information provided
  - Conducts interviews of reporting personnel when required
  - Gathers additional information as available
  - Investigates all safety related reports to the extent appropriate

FAA Example: Event Review

- **The ATSAP ERC:**
  - Includes members from each party to the program:
    - Regulator
    - Service Provider(s)/Certificate Holders
    - Labor union(s)
  - Requires members to sign confidentiality and non-disclosure agreements
  - Meets at least twice a month
  - Uses both informal and formal methods to resolve reports
    - May recommend additional training to address an employee's performance that demonstrates a lack of qualifications
    - May issue a formal Corrective Action Request requiring response from the service provider

References

- **Compliance and Enforcement Resources:**
  - FAA Order 1100.161 and FAA Order 8000.373
- **Safety Culture Resources:**
  - Do You Have a Safety Culture? by Robert Sumwalt
  - Safety Culture in Air Traffic Management: A White Paper
  - SKYbrary Safety Culture Toolkit and SKYbrary Safety Culture Discussion Cards
- **Voluntary Reporting Resources:**
  - FAA Order JO 7200.20
  - FAA Order 7200.22
- **ICAO Safety Management Manual, Doc 9859**


Compliance
Program

Compliance Program

- **Establishing a compliance program:**
  - Promotes safety culture in the regulator and service provider(s)
  - Builds trust, confidence, and goodwill between regulator and service provider(s)
  - Is transparent to the service provider(s)
  - Assists service providers in understanding regulatory requirements
  - Supports open and transparent relationships with labor unions

Compliance Program

- **An effective compliance program:**
  - Is transparent to regulators and service providers
  - Includes defined roles and responsibilities for regulators and service providers, as appropriate
  - Ensures accountability
  - Reflects organizational values

Developing Organizational Values

- **Values** are traits or qualities that are considered worthwhile
  - Represent highest priorities
- **Value statements** are grounded in values and define how people want to behave with each other
  - Values manifest in daily decision making

Build an Organization Based on Values (http://humanresources.about.com/od/strategicplanning1/a/organizvalues.htm)

Developing Organizational Values

- **Values can be allowed to develop on their own,** *or*
- **Organizations can develop value statements to reflect priorities**
  - Effective organizations identify and develop a clear, concise and shared meaning of values/beliefs, priorities, and direction so that everyone understands and can contribute

Build an Organization Based on Values (http://humanresources.about.com/od/strategicplanning1/a/organizvalues.htm)

Developing Organizational Values

- **To ensure values have impact:**
  - Develop organizational objectives that are grounded in the identified values
  - Include values in decision-making
  - Reward and recognize employees and actions that embody the values

Sample Values		
Integrity	Accountability	Persistence
Reliability	Responsibility	Diligence

Build an Organization Based on Values (http://humanresources.about.com/od/strategicplanning1/a/organizvalues.htm)

FAA Example: Office of Aviation Safety (AVS) Values

What other values do you think are important to a safety-focused organization?

Compliance Program

- **Key questions to consider in developing a compliance program:**
  - What are your compliance goals?
    - Examples:
      - “100% compliance, 100% of the time”
      - “Do the right thing”
      - “Make a good faith effort”
  - Will you treat all violations and non-compliance issues equally?
    - How will you respond to repeated violations?
    - How will you handle unique risks or circumstances?

Compliance Philosophy (http://www.summitservicesgroup.com/compliance-philosophy)

Compliance Program

- **Key questions to consider in developing a compliance program:**
  - How will you balance corrective action and enforcement?
  - What are the roles for regulator and service provider?
    - How will you reflect these roles in your compliance philosophy?

Compliance Philosophy (http://www.summitservicesgroup.com/compliance-philosophy)

FAA Example: Compliance Program

- **The aviation and aerospace industry has a statutory obligation to comply with regulatory standards**
  - This includes a duty to develop and use processes and procedures that will prevent deviation from standards
- **Open and transparent exchange of data between the FAA and the aviation community is instrumental to safety and compliance with standards**

FAA Example: Compliance Program

- **When deviations from standards do occur, FAA will use the most effective means to return the individual or entity to full compliance *and* prevent recurrence**
  - Some deviations may result from flawed procedures, simple mistakes, lack of understanding, or diminished skills
  - These can most effectively be addressed through root cause analysis, training, and education
- **Intentional or reckless deviations from standards pose the highest risk to safety and require strong enforcement**

FAA Example: Air Traffic Safety Oversight Compliance Program

- The service provider is responsible for compliance with standards
- Priority should be given to compliance issues with the most associated risk
- Compliance issues should be resolved at the appropriate level of the service provider
- Lack of compliance may indicate a lack of appropriate standards
- Take compliance and enforcement action to prevent future actions that would violate the regulations

Track Corrective Actions

- **Tracking safety issues identified through surveillance requires:**
  - Prioritization of safety issues according to risk
  - Collaboration with ANSP(s)
  - Tracking database
  - Follow-up monitoring and surveillance, as appropriate

FAA Example: Compliance Process

- **The Air Traffic Safety Oversight Service prioritizes compliance issues according to risk:**
  - LOW-RISK compliance observations
  - LOW-RISK, REPEAT OBSERVATION compliance issues
  - MEDIUM-RISK compliance issues
  - HIGH-RISK compliance issues
- **Different actions are taken depending on the seriousness of the safety risk**

FAA Example: Compliance Process

- **The Air Traffic Safety Oversight Service prioritizes compliance issues according to severity and likelihood**

AOV I-RAV Matrix						
	Severity / Likelihood	5 Minimal	4 Minor	3 Major	2 Hazardous	1 Catastrophic
A	Frequent	1.1	2.1	2.8	3.4	4.0
B	Probable	0.9	1.8	2.5	3.0	3.5
C	Remote	0.8	1.7	2.1	2.6	3.0
D	Extremely Remote	0.6	1.2	1.6	2.0	2.3
E	Extremely Improbable	0.5	0.7	0.9	1.1	1.3

- **Different actions are taken depending on the seriousness of the safety risk**

FAA Example: Resolving Compliance Issues

- **There are four (4) ratings of noncompliance**
  - CO: RAV < than 1.5
  - C1 RAV < 1.5 and
    - » a repeat noncompliance or
    - » previously reported to the ATO by other organizations such as the NTSB
  - C2 RAV >/= 1.5 but < than 2.0
  - C3 RAV >/= 2.0

FAA Example: Resolving Compliance Issues

- **A low-risk safety compliance issue (CO)**
  - Reported to the service provider via an Audit Report
  - No acknowledgement of the noncompliance or corrective action plan (CAP) required from the ANSP
  - The ANSP is expected to correct the noncompliance
  - Issue monitored until correction

- **A low-risk, safety compliance issue (C1)**
  - Reported to the service provider via an Audit Report and a Memorandum of Noncompliance (MON)
  - A response from the ANSP is required when the noncompliance has been corrected
  - Issue monitored until correction

FAA Example: Resolving Compliance Issues

- **A medium-risk safety compliance issue (C2):**
  - Requires the ANSP to submit a Corrective Action Plan (CAP) detailing how it plans to return the issue to compliance *and* prevent recurrence
  - A medium-risk issue is administratively closed after the CAP is accepted, but monitored until corrected
- **A high-risk safety compliance issue (C3):**
  - Requires verifying the effectiveness of the CAP through documentation or observation
  - After verifying the issue has been corrected, the noncompliance issue is closed

FAA Example: Tracking Database

- **The Air Traffic Safety Oversight Service tracks the following data points for each compliance issue:**
  - Date identified
  - Issue number
  - Issue title
  - Status of issue and status summary
  - Source of compliance issue
  - Level of the issue (C1, C2, C3)
  - Branch assignment
  - Issue lead
  - Due date
  - Completion/closure date

WHAT is it?

WHERE was it identified?
WHY is it important?
HOW will it be resolved?

WHO is responsible?

WHEN will it be resolved?

- **Information from closed noncompliance issues is available and searchable for research**

FAA Example: Other Safety Issues

- **Observations of Potential Adverse Safety Impact (OPASI)**
  - Issues that may adversely impact safety, but do not relate to specific requirements
  - Not considered noncompliance
  - Examples may include:
    - Discrepancies in procedures between controllers or facilities
    - Vague requirements
    - Gaps in requirements

FAA Example: Resolving OPASIs

- **ANSP expected to examine the OPASI using Safety Management System (SMS) procedures**
  - Determine if there is an adverse impact on safety
  - If so, determine the resolution
- **Monitored as necessary**

Does your ANS oversight organization rank compliance issues?

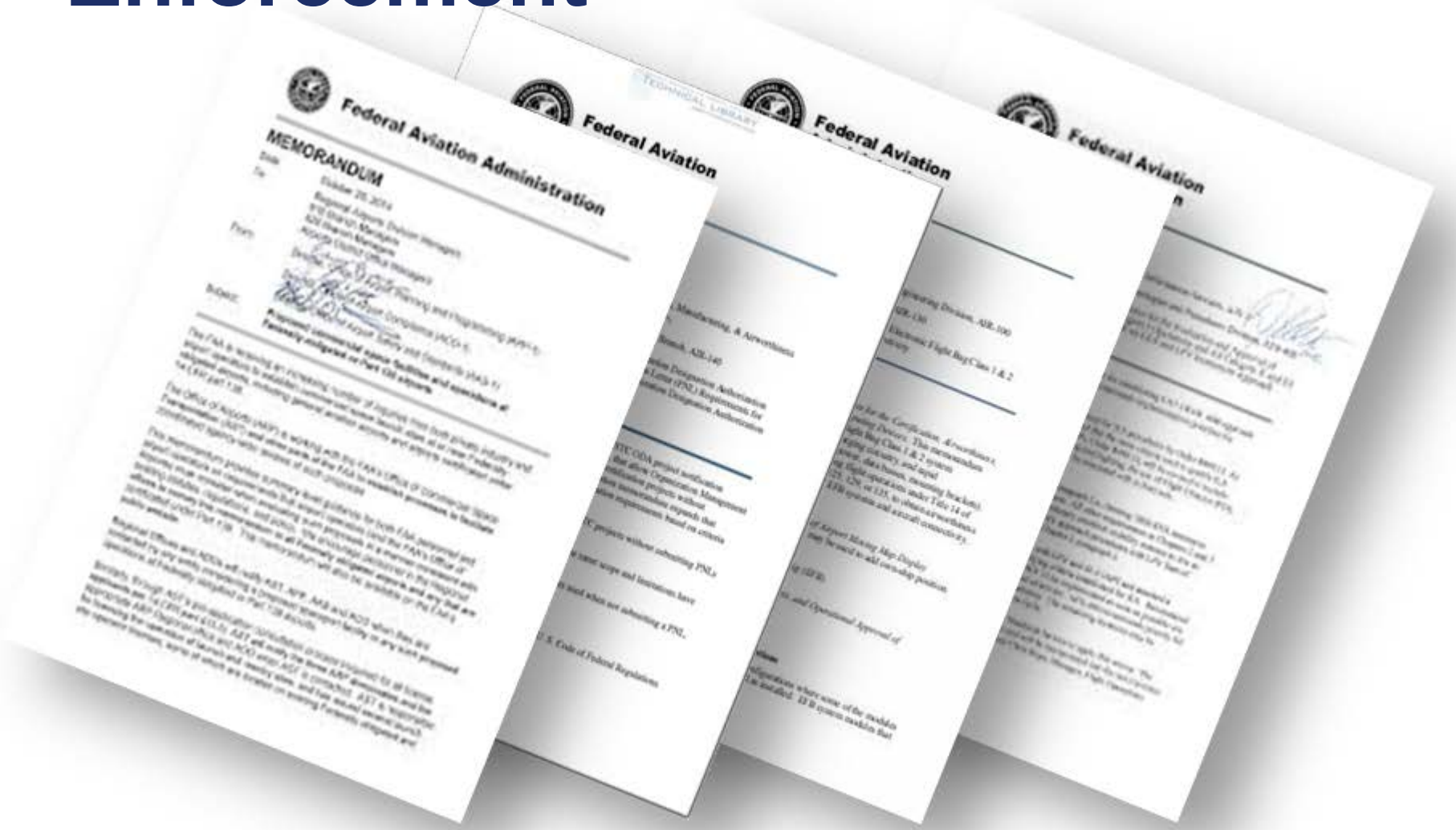
A. Yes

B. No

Follow-Up Surveillance on Compliance Issues

- **Verification and validation audit**
- **Follow-up and/or replication audits**
- **Hazard tracking**
  - ANSP must track and mitigate hazards
  - ATS oversight organization should have access to the ANSP database

Enforcement



Enforcement
Resolving Compliance Issues

- **Enforcement authority should:**
  - Be fair and consistent
  - Target repeated problems
  - Enable and encourage the regulator to take immediate action if necessary to mitigate a safety issue
  - Document identification and resolution of issues
  - Be transparent to the service provider(s)
  - Include a dispute process

FAA Example: Enforcement

- **The Air Traffic Safety Oversight Service (AOV) has the authority to issue:**
  - Letters of Correction
  - Warning Notices
  - Safety Directives requiring the service provider to make a change, stop a procedure, or alter a practice
- **AOV enforcement authority is documented in FAA Order 1100.161**
  - Available to all FAA personnel

FAA Example: Enforcement

- A **Letter of Correction** formally documents the service provider's correction of instances of noncompliance
- A **Warning Notice** brings to the service provider's attention that *immediate* action is required to correct an unsafe condition
- A **Safety Directive** is a mandate to take immediate corrective action to address a noncompliance issue that creates a significant unsafe condition

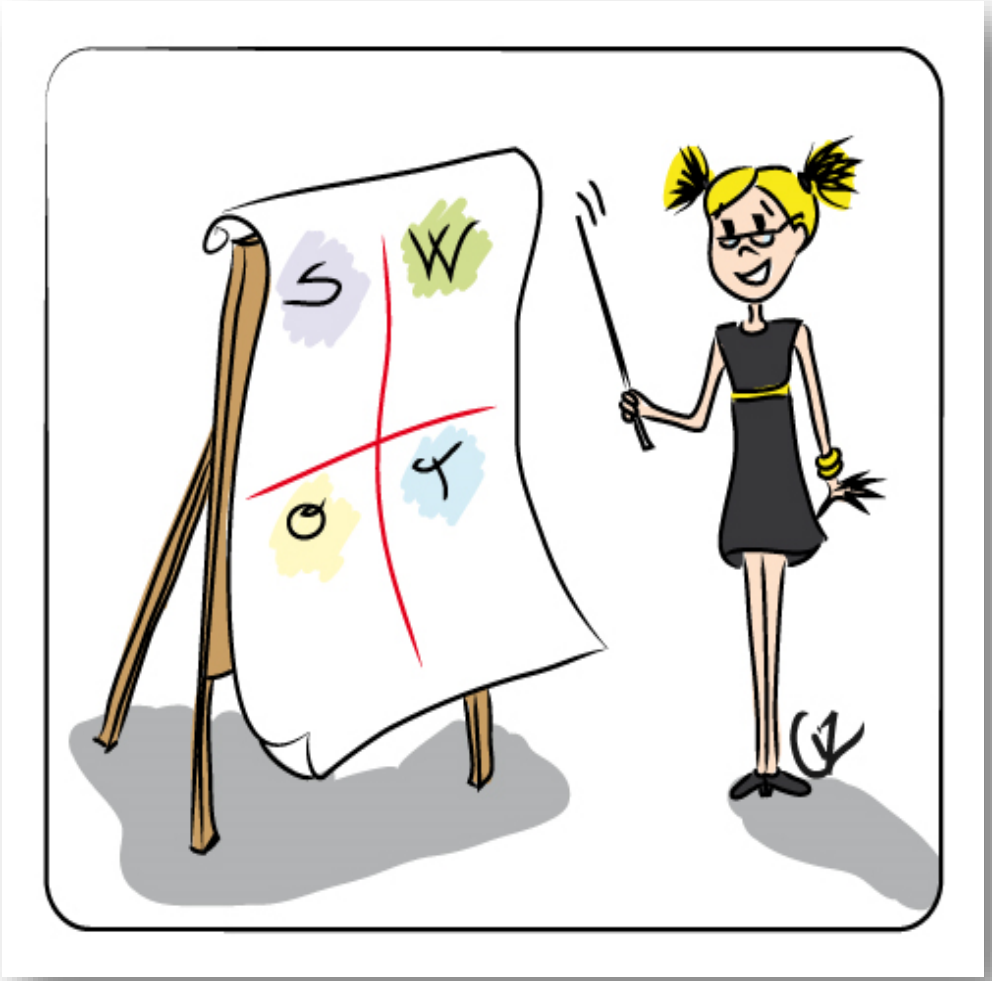
Strategies for Resolving Safety Issues

- **Build a cooperative relationship with service providers**
- **Take enforcement action swiftly when necessary**
- **Establish an objective and transparent dispute process**
- **Require robust reporting**
- **Encourage a safety culture**

Activity

SWOT Analysis[1]…

Critical Element 8



[1] Innovation Games (www.innovationgames.com)

SWOT Analysis Game

- **Strengths**
- **Weaknesses**
- **Opportunities**
- **Threats**

SWOT Analysis Worksheet: Critical Element 8

Ideal End State: The air traffic safety oversight organization identifies safety concerns and deficiencies, and takes appropriate action to ensure that service provider(s) resolve issues

- **The primary aviation legislation grants the air traffic safety oversight organization necessary authority to resolve safety issues**
- **Deadlines established for corrective action**
- **Personnel participate in voluntary reporting programs**

Strengths What do you do well? What unique resources can you draw on? What do others see as your strengths?	**Weaknesses** What could you improve? Where do you have fewer resources than others? What are others likely to see as weaknesses?

CE 8 – Ideal End State

- **The air traffic safety oversight organization identifies safety concerns and deficiencies, and takes appropriate action to ensure that service provider(s) resolve issues**
  - The primary aviation legislation grants the air traffic safety oversight organization necessary authority to resolve safety issues
  - Deadlines established for corrective action
  - Personnel participate in voluntary reporting programs

Activity Instructions

1. Assemble in groups
2. Choose a facilitator/recorder for each group (time keeper)
3. Access the SWOT Analysis Worksheet
4. Work together to complete a SWOT analysis for CE 8
5. Prioritize to identify the best ideas
6. Report on your discussions

Review: Applying the USOAP Eight Critical Elements to Air Traffic Safety Oversight

Applying the Critical Elements to Air Traffic Oversight

Critical Element 1 — Primary Aviation Legislation

- Primary aviation legislation for air traffic oversight should establish an oversight organization independent from air navigation service providers (ANSPs)

Critical Element 2 — Specific Operating Regulations

- Require ANSPs to use a Safety Management Systems (SMS) approach
- Establish defined roles and responsibilities for civil and military aviation authorities

Applying the Critical Elements to Air Traffic Oversight

Critical Element 3 — State Aviation System and Safety Oversight Functions

- Consider size and complexity of aviation activity in the oversight organization structure
- Structure the organization around essential responsibilities
- Review ANSP organization to assist in designing the oversight authority's organization structure
- Leverage regional and bilateral relationships with other oversight authorities
- Ensure safety inspectors are credentialed

Critical Element 4 — Qualified Technical Personnel and Training

- Hire experienced technical experts and train them to become safety professionals
- Develop a comprehensive training program
- Train the entire workforce to conduct audits
- Establish a progression for increasing responsibilities

Applying the Critical Elements to Air Traffic Oversight

Critical Element 5

Technical Guidance, Tools and Provision of Safety Critical Information

- Develop technical guidance and tools for air traffic safety oversight personnel
- Use Standard Operating Procedures to standardize safety oversight, compliance, and licensing functions within an organization

Critical Element 6

Licensing, Certification, Authorization and Approval Obligations

- Establish a licensing program for personnel providing safety-related ATC services
- Consider adopting a systems safety approach to assess and monitor ANSP SMS implementation
- Distinguish between high, medium, and low-risk activities

Applying the Critical Elements to Air Traffic Oversight

Critical Element 7 — Surveillance Obligations

- Develop a continuous surveillance program to ensure that the standards of a service provider's capability and competence are equal to or exceed those required at the time of original certification (the baseline)

Critical Element 8 — Resolution of Safety Concerns

- Encourage a safety culture in the oversight authority and service providers
- Prioritize compliance activities according to risk and take enforcement action when necessary

Safety Management System Fundamentals

An Overview

What is Safety?

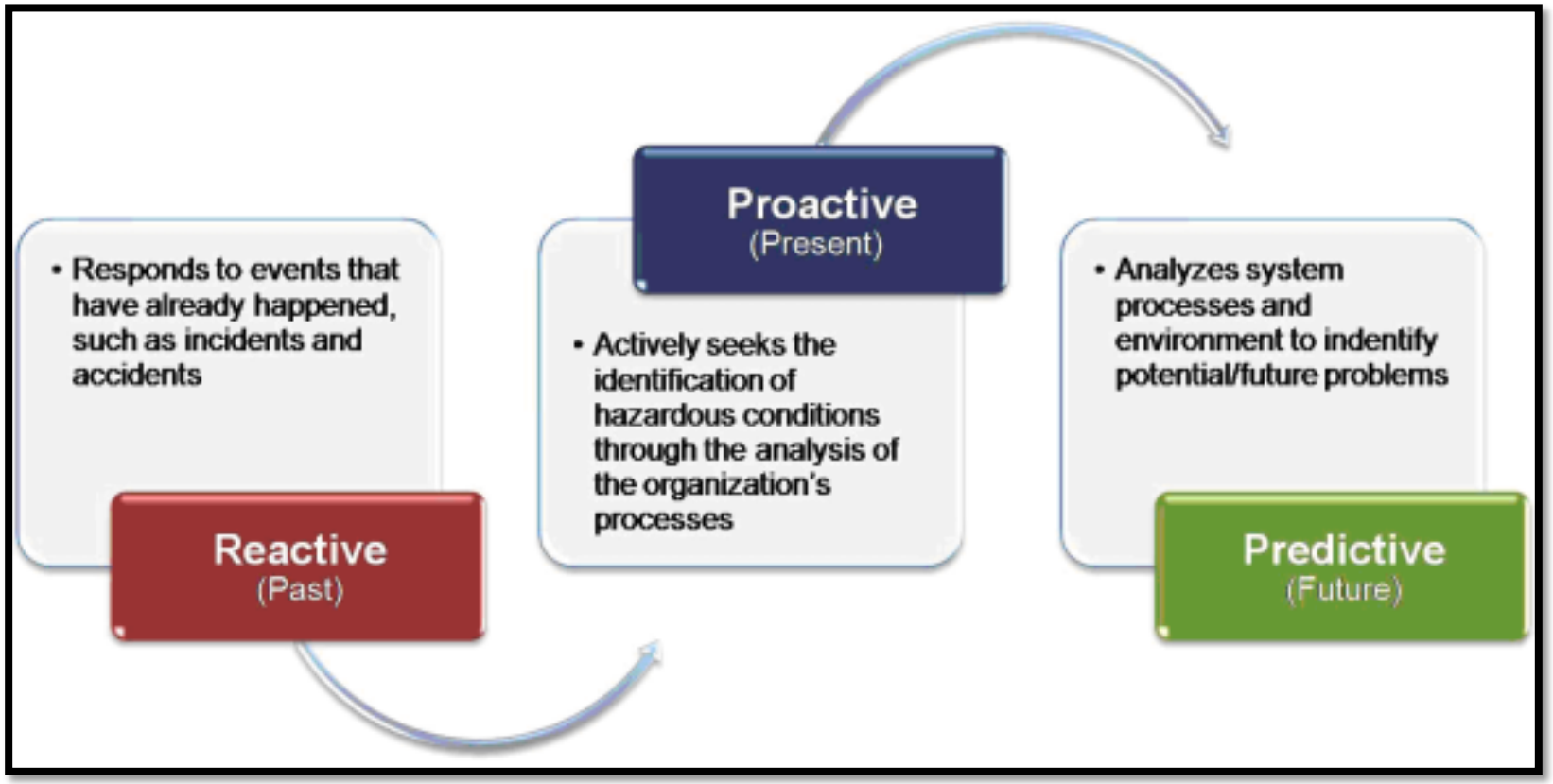
- **According to Annex 19:**
  - ***Safety*** is the state in which ***risks*** associated with aviation activities, related to, or in direct support of the operation of aircraft, are ***reduced*** and ***controlled*** to an *acceptable level*

What does safety management mean to you?

What is SMS?

- A **Safety Management System** is a *systematic approach to managing safety*, including the necessary organizational structures, accountabilities, policies and procedures
- An integrated collection of processes, procedures, and programs that ensure a formalized and proactive approach to system safety through risk management
  - Risk assessments are required for all changes to identify safety impacts
  - The SMS ensures that all changes are documented and all problems or issues are tracked to conclusion

Reactive to Predictive



Steps to SMS Implementation

- **SMS implementation represents a transition from the legacy focus on compliance with requirements to performance-based safety improvement**
  - An SMS should be appropriate to a service provider's size and operational complexity

Questions that SMS Answers

- Are there currently unmanaged risks or leading indicators pointing to unsafe conditions?
- Did you introduce additional risk through mitigations or system improvements?
- Who will mitigate the risks? How?
- How do you know that you are reaching your safety goals?

Why SMS?

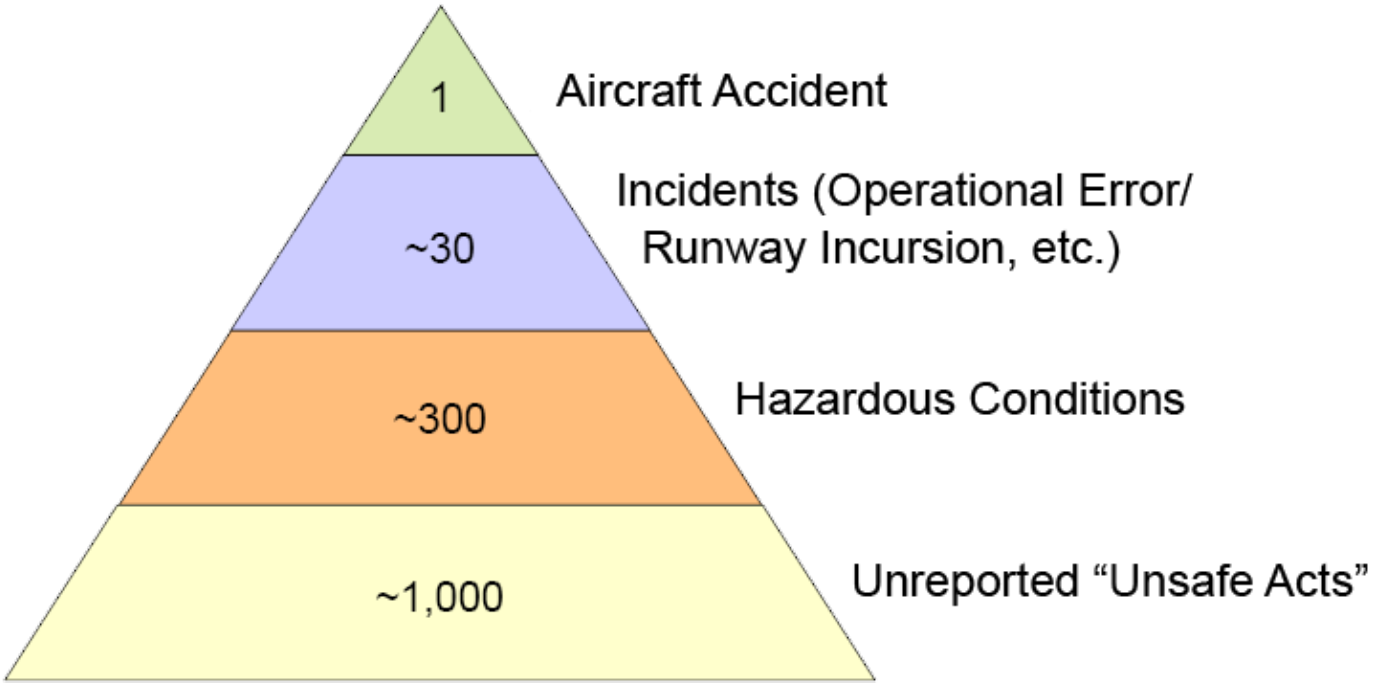
- **Safety Management Systems:**
  - Improve accountability for safety through defined managerial roles and responsibilities and SRM processes
  - Allow an organization to adapt to change, increasing complexity, and limited resources
  - Foster a positive safety culture that can help improve system safety

Why SMS?

- **SMS has many benefits:**
  - SMS is a disciplined and standardized approach to mitigating hazards *prior to unsafe outcomes being realized*
    - Traditional approach to safety is weighted towards addressing hazards that had already been identified
    - For each hazardous condition, many unreported unsafe acts or circumstances might exist

Why SMS?

- **Heinrich's Triangle** illustrates the number of incidents, hazardous conditions, and unreported "unsafe acts" that occur for every one airport accident



Why SMS?

- **Other benefits of SMS include:**
  - Cross-functional Safety Risk Management among air traffic service providers
  - Intra-agency stakeholder participation in solving safety challenges
  - Safety saves money
  - Reduction in the number of isolated safety decisions, thus contributing to the more efficient use of time and resources
  - Assessment the performance of organization (safety assurance) while retaining the ability to assess risk directly of the product and service (safety control)

SMS Components

- **The SMS components ensure that a service provider is able to:**
  - Systematically look for the things that can and do go wrong (hazards) in a system or operation
  - Find, describe, and track these hazards, their causes, and inherent risk(s)
  - Prioritize the hazards according to risk
  - Mitigate the risk(s)
  - Verify that the mitigations work
  - Document all of the above

Systematic Safety Management

- **The four SMS components work together to assist organizations in managing safety by answering the following fundamental questions:**
  - What will be the next accident?
  - How do you know?
  - What are you doing about it?
  - Is it working?

SMS Components

SRM: Key Concepts

- **Safety Risk Management (SRM)** is a critical component of an SMS
- SRM establishes formal methods for identifying hazards, controlling, and continually assessing risk
  - The objective of SRM is to assess the risks associated with identified hazards and develop and implement effective and appropriate mitigations

SRM: Key Concepts

SRM: Why is it Important?

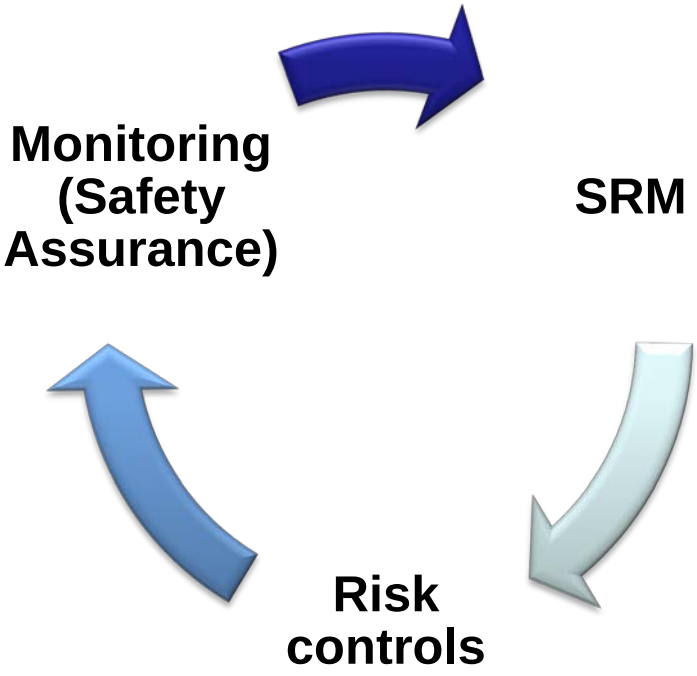
- **SRM ensures that changes or modifications do not negatively impact safety**
  - The current system is the starting point, or *baseline*, for establishing the safety of the system and evaluating the potential safety impact of changes
  - The service is required to maintain the airspace system at a safety level at least equal or better than the baseline
  - Compliance with the approved SMS is required for all changes

SRM: Roles and Responsibilities

- **The service provider is responsible for:**
  - Conducting a safety risk assessment in compliance with the approved SMS
  - Documenting the results of the SRM in a safety case as required
  - Providing the safety case for regulator's review and approval before implementing any changes
- **The regulator is responsible for:**
  - Reviewing the service provider's safety case and providing approval in a timely manner
  - If approval is withheld, the regulator must advise the service provider of the rationale and identify the information necessary to issue an approval

SRM and Safety Assurance

- **Relationship between SRM and Safety Assurance:**



SRM: Safety Assurance

- **Provides confidence that the SMS is operating as designed**
  - Evaluates the continued effectiveness of implemented risk control strategies
  - Supports the identification of new hazards
- **Safety assurance is used to:**
  - Ensure that safety risk control strategies are in place
  - Assess whether they are achieving their intended objectives (risk reduction)
  - Monitor for unintended consequences
- **If controls are not adequately reducing risk, then they are modified and/or additional controls are developed through the SRM process**

SRM and Safety Assurance

- **SRM provides:**
  - System analysis
  - Identification of hazards
  - Analysis and assessment of safety risk
- **SRM produces:**
  - Safety risk controls

Safety Assurance

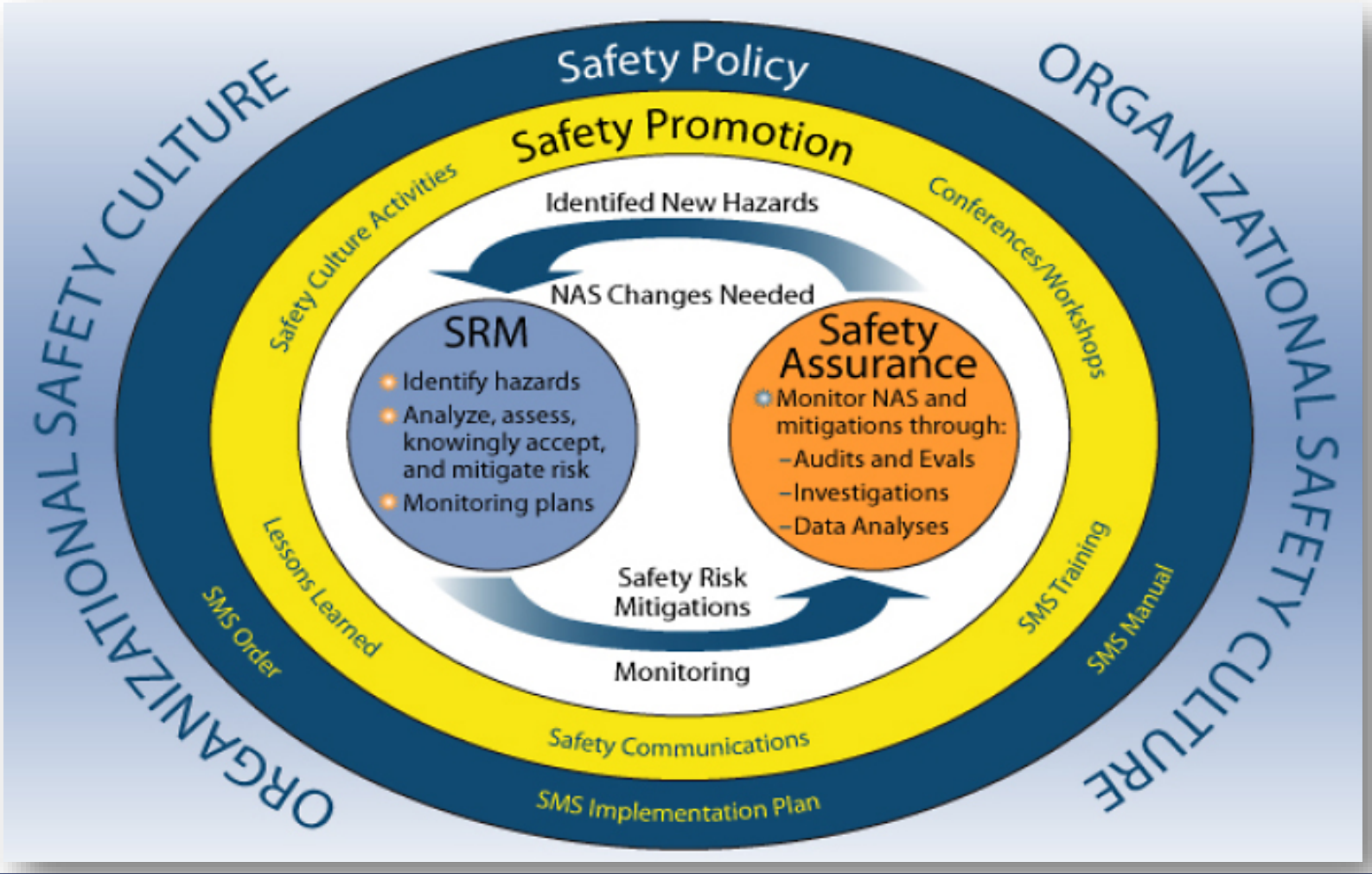
- **Safety assurance activities should include the development and implementation of corrective actions in response to findings of systemic deficiencies having a potential safety impact**

Safety Assurance: Roles and Responsibilities

- The **service provider** is responsible for:
  - Safety performance monitoring and measurement
  - Change management
  - Continuously improving the SMS
- The **regulator** is responsible for continuously monitoring, evaluating and approving changes to the service provider's safety management processes

SKYbrary, Safety Assurance: http://www.skybrary.aero/index.php/Safety_Assurance

FAA Example: Safety Assurance




QUESTIONS?