Critical Element 4

Technical Personnel Qualification and Training

Critical Element 4

- **Technical Personnel Qualification and Training**
  - The establishment of minimum knowledge and experience requirements for the technical personnel performing safety oversight functions and the provision of appropriate training to maintain and enhance their competence at the desired level.
  - The training should include initial and recurrent (periodic) training.
- **The regulatory authority must ensure that the oversight inspector workforce is capable of conducting effective surveillance of services in a standardized manner.**

CE-4 Applicable USOAP PQs

- **Inspector Requirements**
- **Inspector Training**
- **SSP and SMS Training**
- **Training Records**

Applying CE 4 to Air Traffic Oversight

Applying CE 4 to Air Traffic Oversight

- Hire experienced technical experts and train them to become safety professionals
- Develop a comprehensive training program, including recurring training
- Train the entire workforce to conduct oversight
- Establish a progression for increasing responsibilities
- Ensure training records are documented and maintained

Important Workforce Skills

- **Air traffic safety inspectors should:**
  - Have a high degree of integrity
  - Be impartial in carrying out their tasks
  - Be tactful
  - Possess good communication skills
  - Have a good understanding of human nature
  - Be able to evaluate performance of Air Traffic Services or equipment
  - Be methodical and possess analytical skills
  - Have a good understanding of data collection
  - Be familiar with applicable operating requirements

What other characteristics do you think are important for effective air traffic safety inspectors?

Strategies to Recruit Qualified Personnel

Strategies to Recruit Qualified Personnel

- **Engage Personnel Office (Human Resources) in strategic and operations planning**
- **Identify minimum education and experience qualifications**
- **Prioritize qualifications**
- **Become a competitive employer**
  - Consider working with ANSP(s) to require experience in the ATS oversight organization as a prerequisite for important jobs in the ANSP(s)
  - Consider recruiting air traffic controllers who did not complete training and/or are beyond maximum retirement age
- **Write compelling job postings**
- **Consider recruitment incentives**
- **Expect personnel turnover**

FAA Example: Qualifications

- **Position: ANS Inspector (**Air Traffic Control services)
- **Key Qualifications:**
  - Experience as a Certified Professional Controller
  - Knowledge of U.S. National Airspace operating systems
  - Knowledge of air traffic control rules, laws, procedures, policies, regulations, equipment, and systems
  - Data analysis skills
  - Independent research skills
  - Ability to work effectively on teams
  - Written and oral communications skills

FAA Example: Competitive Employer

- **The FAA Air Traffic Safety Oversight Service competes for qualified personnel by:**
  - Enabling experienced Air Traffic Control Specialists to become safety professionals
    - Opportunity for employment after mandatory retirement age
    - Management opportunities in the FAA Air Traffic Organization
  - Offering flexible work schedules and competitive pay/benefits
    - No shift work
  - Providing initial and recurrent technical training
    - Additional training opportunities to develop complementary skills
  - Engaging employees

On a scale of 1-10, how would you rate your ANS inspector training program?

Retaining Qualified Personnel

Retaining Qualified Personnel

- **Recruitment focus should shift to retention once employees are hired**
- **Strategies to retain qualified safety critical staff:**
  - Invest in initial and recurrent training to keep skills current
  - Identify ways to increase employee satisfaction and engagement
  - Develop future leaders

Developing a Training Program

Developing a Training Program

- **Training should:**
  - Be designed to ensure workforce has necessary knowledge, skills, and abilities
    - Fill skill or competency gaps
  - Be timely
    - Initial technical training should be completed within first 12 months of employment
  - Be flexible when necessary
  - Use technology for delivery, as appropriate
  - Promote information sharing and standardization of business practices

Developing a Training Program

- **Key questions to consider:**
  - Who will develop and deliver training?
  - How will training be presented?
  - How will employees be evaluated and credited for having completed training?
  - How will you maintain training records?

On a scale of 1-10, how would you rate your ANS inspector training program?

Rank	Responses
1	
2	
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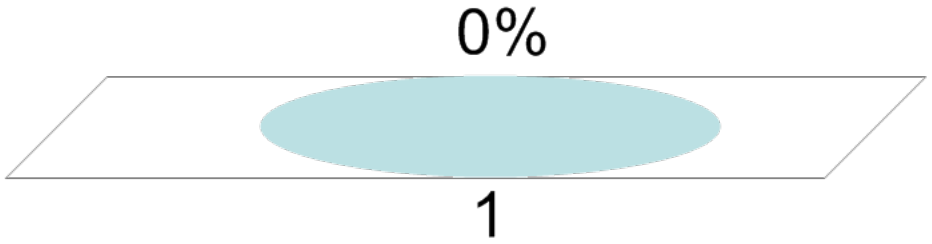

What's In A Training Program?

- **On-boarding/new hire**
- **Initial technical training**
- **Recurrent technical training**
- **Supplemental skills training**
  - Additional training is based on job requirements
- **On-the-Job Training**
- **Managerial/leadership training**

What's In A Training Program?

- **A training program for air traffic safety oversight personnel should include the following topics:**
  - Familiarization with authority and guidance documents (Primary Legislation and Specific Operating Regulations applicable to regulator and ANSPs)
  - Overview of oversight processes and procedures
  - Duties, roles, and responsibilities
  - Standards of conduct
  - Enforcement procedures
  - Proficiency exam

Strategies for Successful Training Programs

- **Identify and prioritize training needs and requirements for safety critical occupations**
- **Incorporate standard messages and concepts into technical training**
  - Examples: SMS, ATM modernization programs/projects
- **Include evaluation tools to test employee knowledge and skills**
- **Periodically review and update training requirements**
- **Seek employee input for training needs**
  - Enable employees to keep pace with changes in the industry

What other topics do you think should be included in a training program for air traffic safety inspectors?

Rank	Responses
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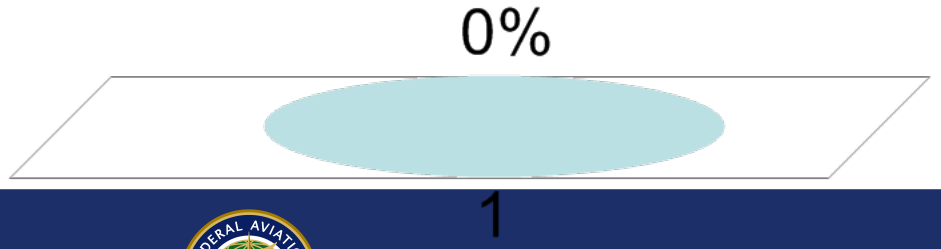


FAA Example: ATSI Training Plan

New Hire

- FAA Office of Aviation Safety Overview Course
- Air Traffic Safety Oversight Service (AOV) Overview Briefing
- 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
- Recurrent ATSI Training

Supplemental Skills Training

- Additional Training: Accident Investigation*
- Records Management
- Staff Work
- Report Writing

FAA Example: Initial Technical Training

- **Audit Skills Instructor-Led Training**
  - Authority and Guidance Documents
  - How to Be a Regulator
  - Nature and Traits of Teams
  - Structure of Audit Teams
  - Audit Proposals
  - Developing the Audit
  - Conducting the Audit
  - Post-audit activities, report writing, and record retention

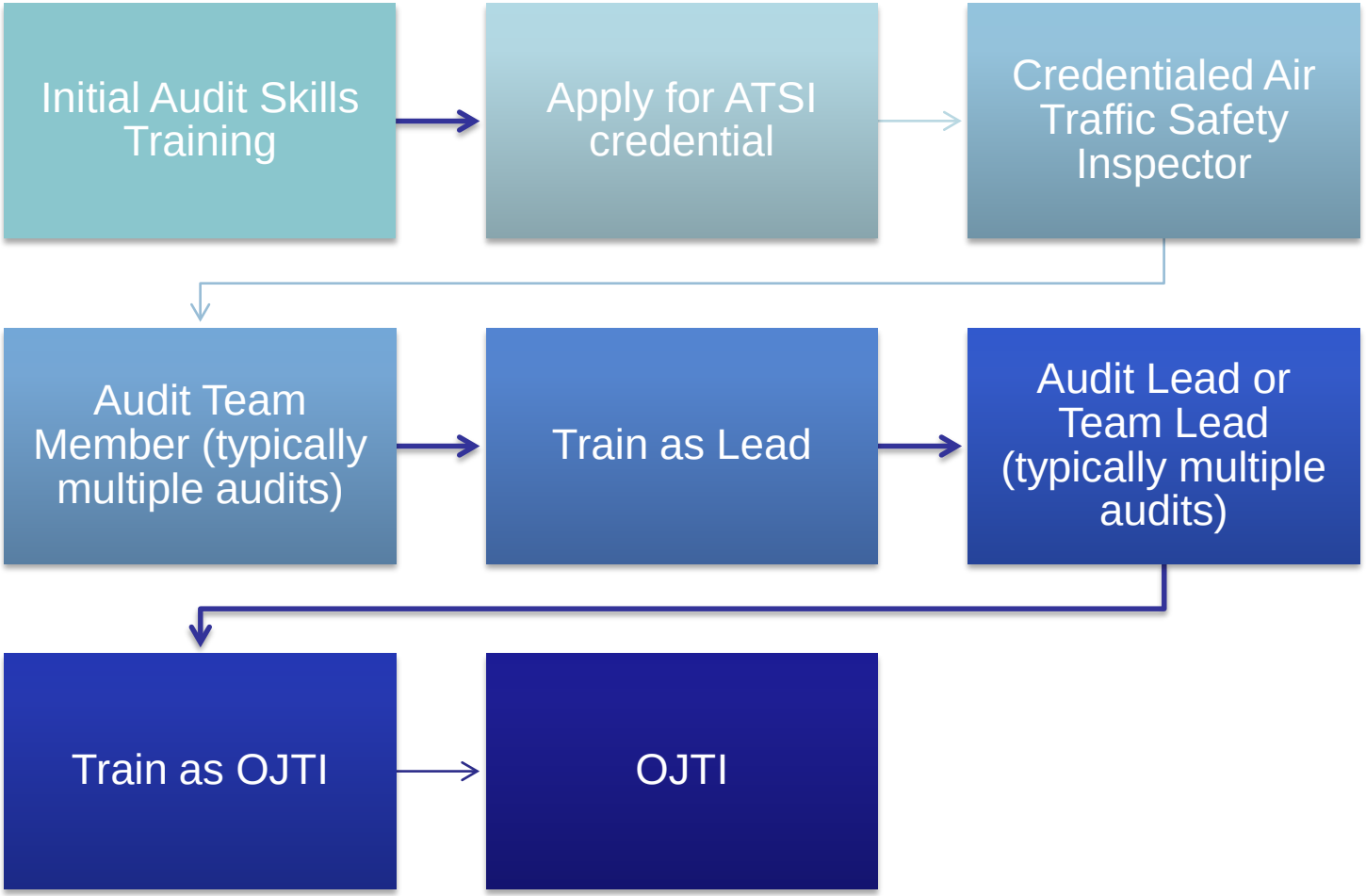
Employee Development

- **Career progression opportunities are important to:**
  - Retain skilled technical personnel
  - Keep employees engaged
  - Evaluate workforce skills through performance of more complex responsibilities
    - Identify competency and/or training gaps

FAA Example: Auditor (ATSI) Progression

- **Credentialed Air Traffic Safety Inspectors may advance to leadership roles in planning and conducting audits, such as:**
  - Team Lead
  - Audit Lead/Desk Audit Lead
  - On the Job Training Instructor (OJTI)
- **Inspectors receive training for these roles from OJTIs**
- **Progression requires peer (OJTI) and management recommendation**

FAA Example: Auditor (ATSI) Progression



FAA Example: Auditor Qualifications

- **Complete the Audit Skills instructor-led training course and pass the exam**
- **Successfully participate in at least one audit**
- **Receive recommendation from Project Manager and Audit Lead**
- **Receive Division Director approval as a qualified auditor**

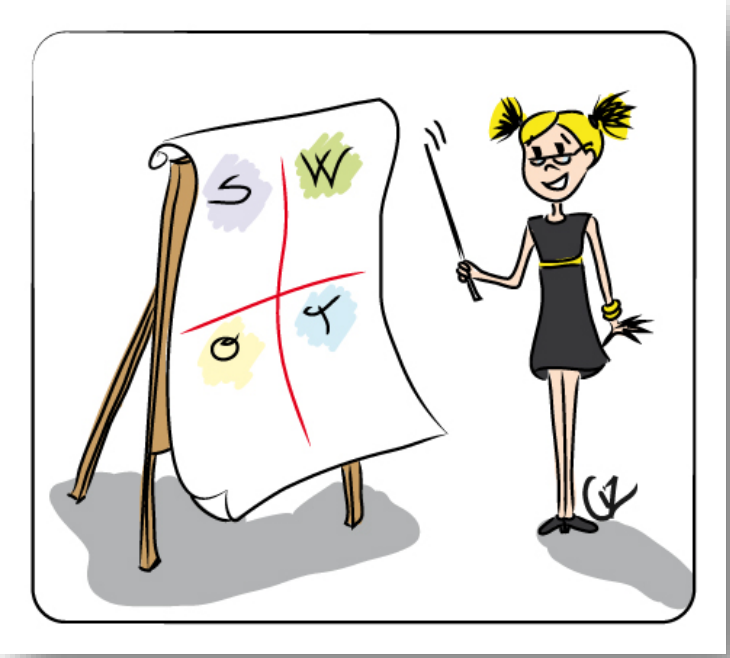
References

- **Job Announcement: AOV Air Traffic Control Specialist**
- **Protocol Question Reference Document**

Activity

SWOT Analysis[1]…

Critical Elements 3 and 4



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

SWOT Analysis Activity

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

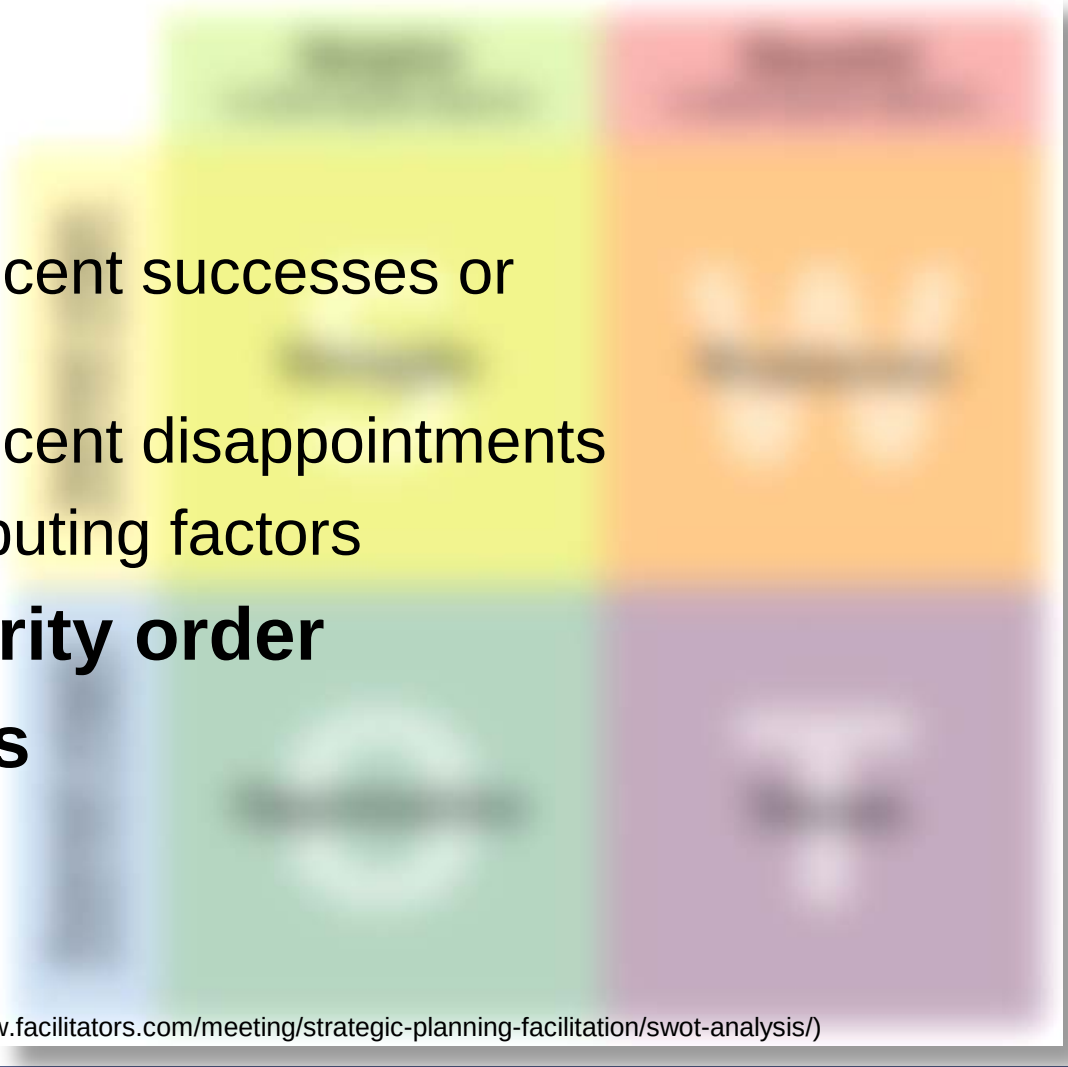
Why SWOT Analysis?

- **Develop awareness of factors involved in a decision**
- **Identify internal and external influences**
- **Uncover opportunities**
- **Understand weaknesses to manage and eliminate threats**
- **Provides a framework for strategic planning**
  - Develop strategies and recommendations based on SWOT analysis results

Business News (http://www.businessnewsdaily.com/4245-swot-analysis.html) and Mind Tools (https://www.mindtools.com/pages/article/newTMC_05.htm)

Successful SWOT Analysis

- **Be specific**
  - Share stories of recent successes or accomplishments
  - Share stories of recent disappointments
  - Identify key contributing factors
- **Rank lists in priority order**
- **Link to next steps**



Meeting Facilitators International: SWOT Facilitation (https://www.facilitators.com/meeting/strategic-planning-facilitation/swot-analysis/)

CE 3 – Ideal End State

- **The air traffic safety oversight organization is appropriately *organized, funded,* and *empowered* to carry out its mission**
  - Structured to effectively fulfill its assigned tasks
  - Employees necessary - technical personnel and support staff

Meeting Facilitators International: SWOT Facilitation (https://www.facilitators.com/meeting/strategic-planning-facilitation/swot-analysis/)

CE 4 – Ideal End State

- **The air traffic safety oversight organization employs a cadre of *qualified*, *experienced*, *competent*, and *dedicated* inspectors to carry out its safety oversight obligations**
  - Robust training program
  - Opportunities for advancement

Meeting Facilitators International: SWOT Facilitation (https://www.facilitators.com/meeting/strategic-planning-facilitation/swot-analysis/)

Activity Instructions

1. **Assemble in groups**
    1. Group 1 and Group 2: CE-3
    2. Group 3 and Group 4: CE-4
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 3 and CE 4**
5. **Prioritize to identify the best ideas**
6. **Report on your discussions**

SWOT Analysis Worksheet: Critical Element 3

Ideal End State: Air traffic safety oversight organization is appropriately *organized*, *funded*, and *empowered* to carry out its mission

- **Structured to effectively fulfill its assigned tasks**
- **Employs necessary technical personnel and support staff**

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?

Learning from the SWOT Analysis

- **How do you use your strengths to take advantage of opportunities?**
- **How do you overcome weaknesses preventing you from taking advantage of opportunities?**
- **How can your strengths reduce the probability of threats?**
- **What can you do about your weaknesses to make the threats less likely?**
- **Use your understanding to develop a plan of action**

How to Use a SWOT Analysis — A Perfect SWOT Analysis Example (http://www.leadershipthoughts.com/how-to-use-a-swot-analysis/)

Critical Element 5

Technical guidance, tools and the provision of safety-critical information

Critical Element 5

- **Technical guidance, tools and the provision of safety-critical information**
  - enables technical personnel to perform their safety oversight functions in accordance with established requirements
  - allows for standardized application of requirements
  - includes provisions from the oversight authority to the aviation industry on the implementation of applicable regulations and instructions
- **The regulatory authority must ensure that air traffic safety oversight personnel understand their duties as well as the responsibilities associated with specific roles within the organization.**

CE-5 Applicable USOAP PQs

- **Guidance materials**
- **Establishment of procedures**
- **AIS and Aeronautical Charts**

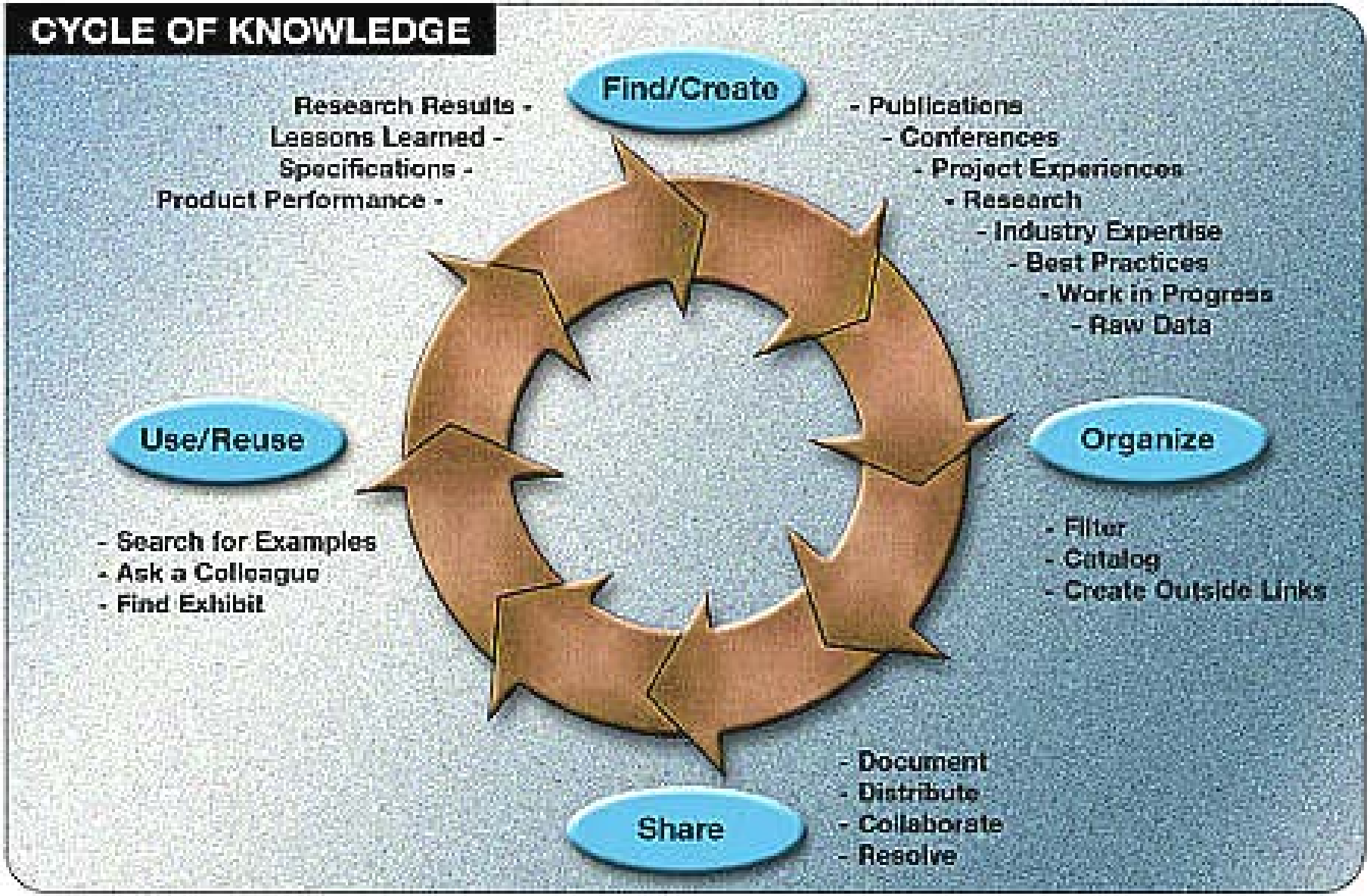
Applying CE 5 to Air Traffic Oversight

- **Technical guidance and tools for air traffic safety oversight personnel should include:**
  - Standard Operating Procedures, forms and templates
  - Centralized information sharing resources
  - Access to data for reference and research
  - Capability to receive and disseminate safety-critical information, such as Temporary Flight Restrictions and accident/incident reports
  - A means of providing guidance to ANSPs

Knowledge Management

- **Knowledge management is the process of capturing and sharing a community's collective expertise to fulfill its mission**
- **Knowledge management:**
  - Takes advantage of employee expertise
  - Provides a library for written information *and* facilitates communication and information sharing
  - Helps ensure that the right information gets to the right people at the right time to make the right decisions

Knowledge Management: Everyone Benefits by Sharing Information, by Mike Burk (https://www.fhwa.dot.gov/publications/publicroads/99novdec/km.cfm)



Knowledge Management: Everyone Benefits by Sharing Information, by Mike Burk (https://www.fhwa.dot.gov/publications/publicroads/99novdec/km.cfm)

Creating a Knowledge Network

- **Successful knowledge management:**
  - Works with an organization's culture
  - Requires a collaborative culture to foster an environment of open sharing and exchange
  - Takes advantage of formal and informal professional networks
  - Is supported by electronic tools that are accessible at any time, in any place
    - The Internet is a powerful knowledge management tool!

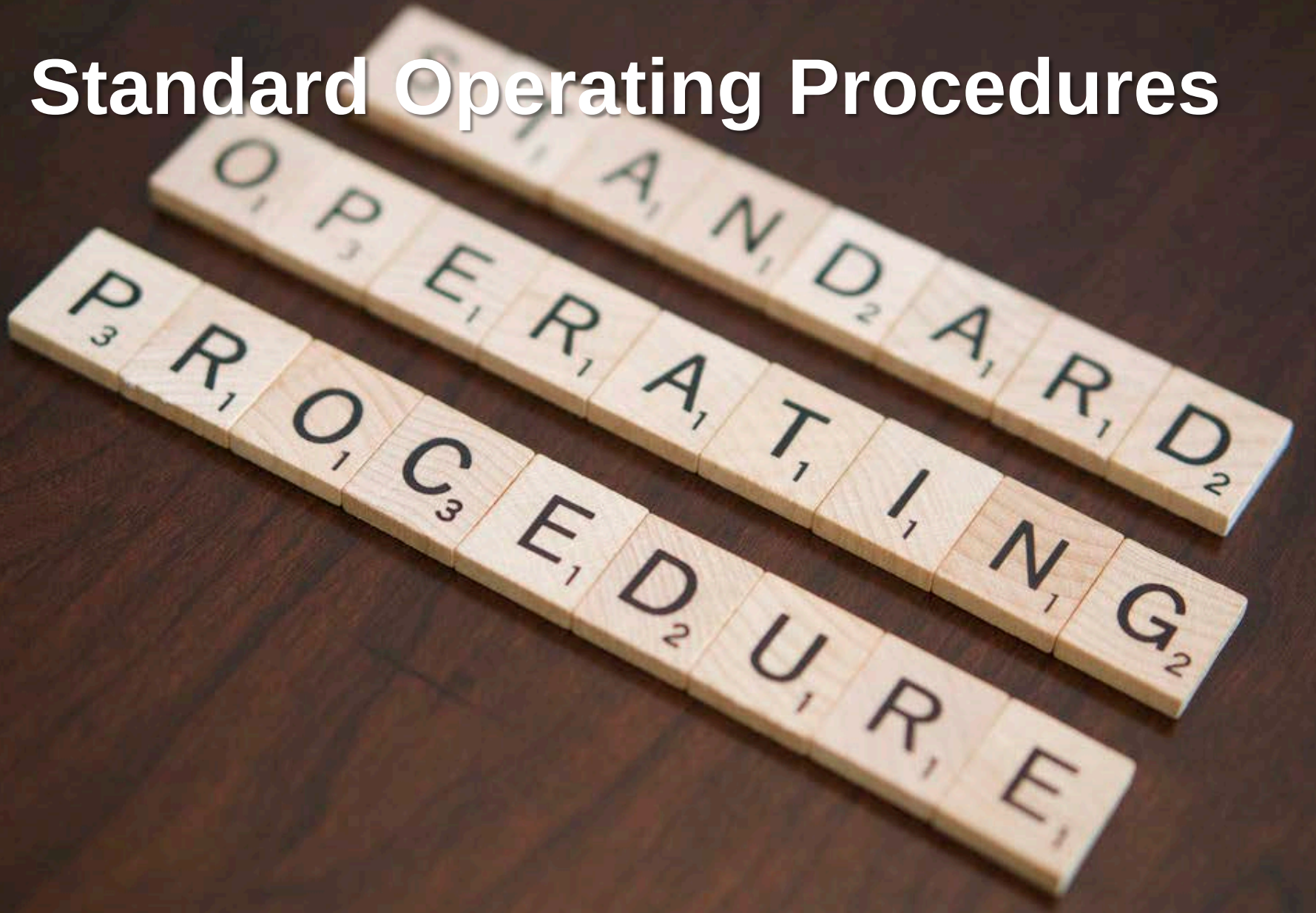
Knowledge Management: Everyone Benefits by Sharing Information, by Mike Burk (https://www.fhwa.dot.gov/publications/publicroads/99novdec/km.cfm)

What have you found to be the most successful way to share knowledge in your organization?

Developing Technical Guidance

- **Technical guidance should:**
  - Be well-defined in scope and topic
  - Be relevant to the intended audience and subject matter
  - Be accurate
  - Be clear
  - Be integrated with an inspector training program
  - Utilize knowledge management framework
  - Be updated regularly – outdated guidance material is not useful!

Standard Operating Procedures



Standard Operating Procedures

- **Standard Operating Procedures (SOPs) are step-by-step instructions to enable employees to carry out an organization's functions**
- **SOPs standardize functions within an organization**
  - SOPs support efficiency and uniformity in performing tasks or providing services

Standard Operating Procedures

- **SOPs may include any or all of the following types of documents:**
  - Templates (e.g. letters, notices, reports)
  - Processes, procedures, and workflow
  - Plans and reports
  - Manuals and handbooks

What do you consider to be your most critical SOPs?

Best Practices for Effective SOPs

- **Review and update SOPs periodically**
  - Collect ideas on a continual basis
  - Strike a balance between stability and continuous improvement
- **Take advantage of available IT resources such as shared network storage and/or web-based tools to ensure personnel have access to standardized information**

Best Practices for Effective SOPs

- **Consider standardization and quality assurance certification, such as ISO 9001**
- **Consider harmonizing with neighbor States**
  - The more similar a State's SOPs are to its neighbor's SOPs, the easier cross-border interaction and cooperation
  - Reduces the cost of doing business
  - Increases confidence in authorities

FAA Example: SOPs

- **The Air Traffic Safety Oversight Service uses Processes, Work Instructions, and Job Aids to standardize critical functions:**
  - Audits
  - Credentialing (Licensing)
  - Surveillance and Compliance
  - Approvals
- **Processes and Work Instructions are managed through a Quality Management System and subject to regular internal audits**

Web-Based Knowledge Sharing Tools

Web-Based Knowledge Sharing Tools

- **Risk-based safety oversight requires access to data and information**
- **Web-based tools support easy storage and retrieval**
  - Many collaborative solutions available
  - Costs range from free (e.g. file sharing platforms such as Google Drive, Dropbox) to expensive (custom-designed, managed by contract personnel)

Access to Information

- **Access to the following types of information supports effective safety oversight:***
  - Service provider safety priorities
  - Operational data
    - System statistics
      - How many facilities?
      - How many operations?
    - Occurrence reports
  - Safety oversight data
    - Surveillance program records
  - Facility-specific information
    - SOPs
    - Operating arrangements (LOAs)

* Discussed in CE 7

FAA Example: AOV Connect

- **Web-based information sharing platform**
- **Contains current copies of all important processes, templates, Work Instructions, and Job Aids**
- **Enables employees located in geographically distant regional offices to produce collaborative products**
- **AOV staff use AOV Connect to:**
  - Review and approve documents and correspondence
  - Archive audit reports
  - Access on-demand training resources
  - Manage workflow and pending tasks

FAA Example: Oversight Tool

- **Credentialing system**
  - Web-based personnel licensing management system
  - Training portal for designees
  - Automation features

Sharing Safety-Critical Information

Sharing Safety-Critical Information

- **Should be timely and comprehensive**
- **Sharing mechanisms include:**
  - Formal
    - Publication of directives, guidance, etc.
  - Informal
    - Regular communication and dialogue between regulator and ANSP(s)

Guidance for ANSPs

- **Technical guidance and tools in CE 5 also includes guidance from the oversight organization to service providers**
- **This may include:**
  - Interpretation of standards and requirements
  - Documentation of decisions for future reference
  - Clarification of processes

FAA Example: SOCs

- **A Safety Oversight Circular (SOC) contains safety-critical information or guidance**
  - An SOC may also contain recommended actions to be taken by the Air Traffic Organization (service provider) to meet requirements in FAA directives
- **SOCs are commonly written to:**
  - Provide an acceptable, clearly understood method for complying with a regulation
  - Resolve misunderstanding of a regulation
  - To help the industry and the FAA effectively implement a regulation
  - To provide the FAA Air Traffic Organization with a standardized implementation of a regulation or to harmonize with the international aviation community

What kind of tools does your organization have to provide guidance to service providers?

Rank	Responses
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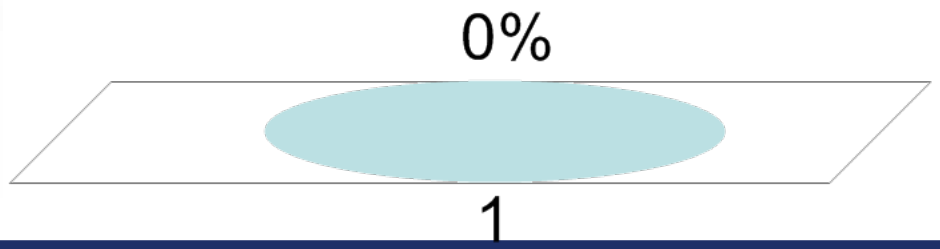


Critical Element 6

Licensing, Certification, Authorization and Approval Obligations

- **CE-6 includes:**
  - The implementation of processes and procedures to ensure that personnel and organizations performing an aviation activity meet the established requirements before they are allowed to exercise the privileges of a license, certificate, authorization, and/or approval to conduct the relevant aviation activity.

CE-6 Applicable USOAP PQs

- Job descriptions
- Training program
- Recruitment and retention
- Assessments and performance monitoring
- Assurance of essential air navigation services

Applying CE 6 to ANS Oversight

- **Essential licensing functions:**[1]
  - Writing and amending rules related to the training and licensing of aviation personnel
  - Assessment and approval of applications for licenses and ratings and the issue of licenses and ratings
  - Application of medical fitness assessments relating to license requirements
  - Approval, designation, and supervision of individuals or organizations delegated to perform specific tasks on behalf of the personnel licensing office

[1]According to the ICAO Safety Oversight Manual

Applying CE 6 to ANS Oversight

- **A licensing program for ANS personnel should include:**
  - Proficiency assessment and qualification (skills check)
  - Medical evaluation
  - Specific ratings/endorsements for unique and specialized functions
  - Procedures to issue, suspend, re-instate, revoke, and renew licenses
  - Centralized recordkeeping system to track licenses and status
- **Licenses should be valid for a limited duration**

FAA Example: Licensing Framework

- **Dedicated licensing staff in the ANS oversight organization**
- **Web-based management tools**
- **Leverage service provider management personnel**
- **Periodic evaluations to ensure controllers continue to maintain the skills they need to do their jobs**
- **Ensure that controllers do not work without a license**

FAA Example: Licensing Framework

Credentialing Program

- FAA Towers
- FAA Contract Towers
- FAA Air Traffic Controllers
- ATSEP/maintenance technicians
- Aeronautical Information Specialists
- U.S. military

Control Tower Operator Certificate

- FAA Contract Towers
- Non-Federal Towers

FAA Example: Credentialing Program

- Licensing: A method whereby all personnel providing direct safety-related services (air traffic controllers, technicians, aeronautical information specialists) are recognized as meeting FAA training and certification requirements

What is Credentialing?

- The credentialing program was developed to provide independent oversight of how personnel are trained and certified to perform direct safety-related air traffic control services or certification on certifiable systems, sub-systems, and equipment in support of the National Airspace System

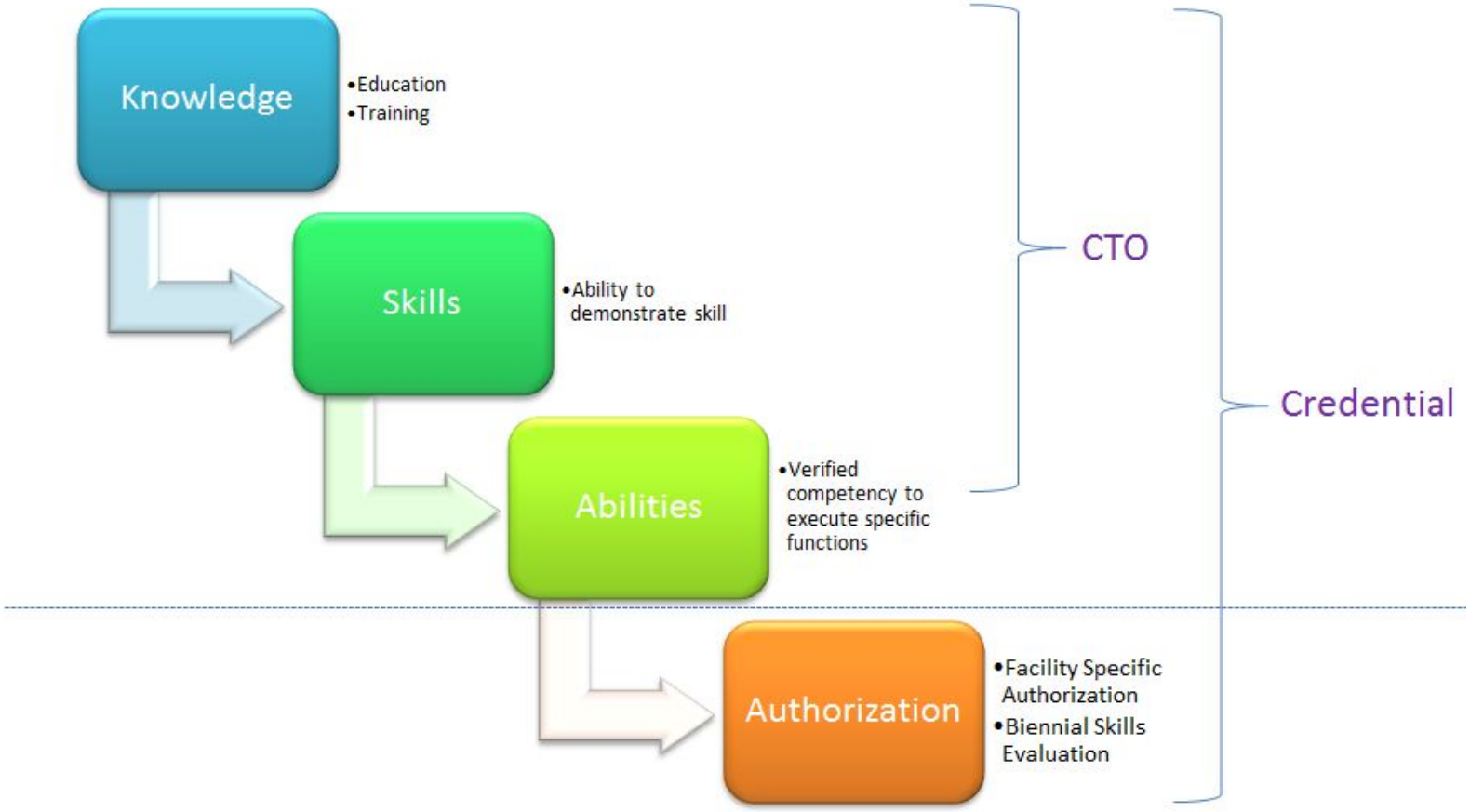
- Credentialing is the program used by the FAA to ensure that operational personnel have the required knowledge, skills and abilities to perform their assigned functions in accordance with ICAO Annex 1

- While technically *not* a license, a credential acts like a license in that the holder is authorized to perform the duties as defined on the credential document

FAA Example: AOV Credentialing Authority

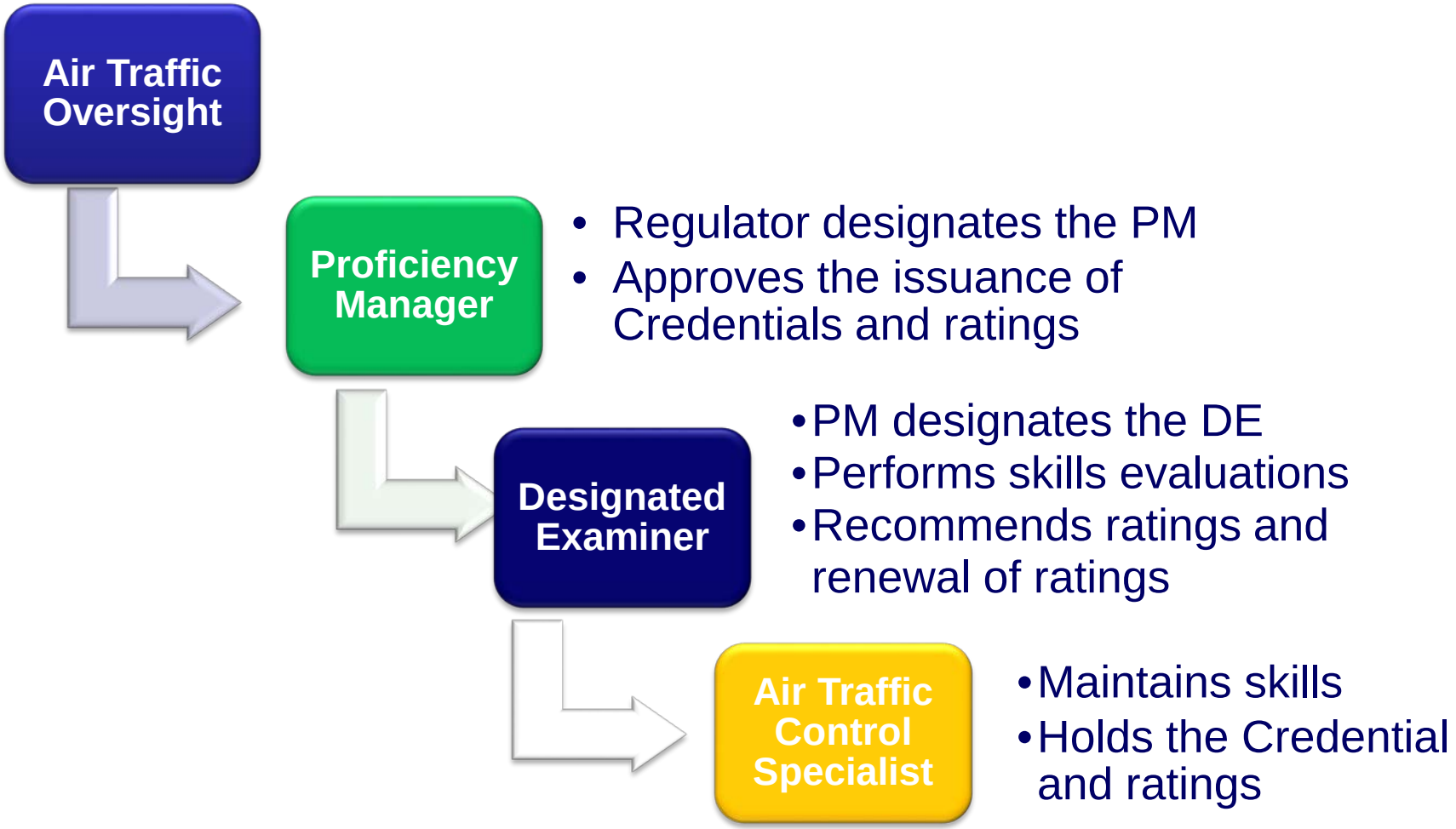
- ICAO Annex 1
- Certification: Airmen other than Flight Crewmembers (Title 14 Code of Federal Regulations part 65)
- Air Traffic Safety Oversight Service (FAA Order 1100.161)
- Air Traffic Safety Oversight Credentialing & Control Tower Operator Certification Programs (FAA Order 8000.90)
- Certification & Rating Procedures for the Department of Defense Personnel (FAA Order 7220.1)

Pathway to the Credential



FAA Order JO 3120.4 Air Traffic Technical Training

The Credentialing Structure



Proficiency Manager Designation

- **Authorizes a Facility Manager or District Manager to:**
  - Designate Credential Examiners
  - Certify that controllers have successfully completed all training and qualification requirements
  - Certify that controllers have passed a skills evaluation
  - Approve the issuance of credentials, ratings, and designations

Designated Examiners

- **Designated Examiners are Front-Line Managers at air traffic control facilities**
  - Must maintain operational currency as required by the ATO
- **Designated Examiners:**
  - Determine whether the controller is qualified and has met training requirements
  - Conduct controller skills evaluations
  - Make recommendations to the Proficiency Manager for the issuance of credentials and ratings to controllers

ATCS Licensing Standards

- **ICAO Standards and Recommended Practices for the licensing of aviation personnel, including air traffic controllers, are contained in Annex 1 – Personnel Licensing, to the Convention on International Civil Aviation**
  - The Annex is applicable to all applicants for and, on renewal, to all holders of the licenses and ratings specified therein
  - Annex 1 prescribes the following rating categories for air traffic controllers

Annex 1	Equivalent Credential Rating
Aerodrome control rating	Tower
Approach control procedural rating	RADAR approach control
Approach control surveillance rating	RADAR approach control
Approach precision radar control rating	PAR
Area control procedural rating	En-route
Area control surveillance rating	En-route

ATCS Credentials

Credential	Rating	Scope
FAA Air Traffic Control Specialist (ATCO)	Tower Radar Approach Control EnRoute	Facility Specific
USAF Air Traffic Control Specialist	Tower Radar Approach Control PAR GCA AIS/TERPS (in process)	Facility Specific
US Navy/USMC Air Traffic Control Specialist	Tower Radar Approach Control Radar Air Traffic Control Facility Fleet Area Control & Surveillance Facility Center Radar Approach Control (CENRAP)	Facility Specific

U.S. Military Credentialing

- U.S. Military ATCS meet the same certification requirements as FAA ATCS
- U.S. Department of Defense (DoD) Air Traffic Controllers stationed outside the NAS will receive a Credential without ratings
  - Credential will state the holder has successfully met FAA training and certification requirements
  - Shows other States the holder has been qualified according to FAA standards
- Status of DoD Credentials
  - United States Air Force (2016, now in sustainment)
  - Department of the Navy & USMC (2017, now in sustainment)
  - Department of the Army (to be initiated in 2019)

Other Credentials

Credential	Rating	Scope
FAA Airway Transportation System Specialist (ATSEP)	Communications NAVAID Surveillance Environmental Automation Weather Power	Certification Authority - Specific (Equipment type)
NGA Aeronautical Information Specialist (AIS)	Graphic Design Aeronautical Information Publication Management Aeronautical Information Processing Digital Terminal Design Procedure Design Vertical Obstructions Airport Mapping	Product Release Authority - Specific

ATSS Credentialing

- Airway Transportation System Specialist (Air Traffic Safety Electronic Personnel - ATSEP) - Install and maintain electronic equipment and lighting aids associated with facilities and services required for aviation navigation to assure a reliable, safe, and smooth flow of air traffic
- It includes periodic maintenance (inspection and analysis of equipment with associated adjustments), corrective maintenance, troubleshooting, repair and replacement of malfunctioning equipment, and certification
- Ensures technicians posses and maintain correct knowledge, skills and abilities
  - Maintains biannual skill evaluation requirement

AIS Credentialing

- Ensure participants maintain an organization that has competent personnel, procedures, and processes for the life-cycle management of information and standards that support mission essential and support functions that enable operations in the National Airspace System

- Provide oversight of information providers as they are the last entity to release/authorize data to go into production or release.

Control Tower Operator Certificate

- **Issued to individuals who do not hold an FAA air traffic Credential *and* meet the following requirements:**
  - Eligibility
  - Knowledge
  - Skill
  - Practical experience
- Control Tower Operator Certificate requirements are contained in:
  - Title 14 Code of Federal Regulations part 65, subpart B
  - FAA Order 8000.90
- A CTO certificate authorizes the holder to operate only at the facility for which s/he is rated

CTO Facility Rating

- **Applicants for a facility rating must pass a practical test specific to each operating position at the control tower at which the rating is sought**
  - Only a CTO Examiner may issue a CTO facility rating

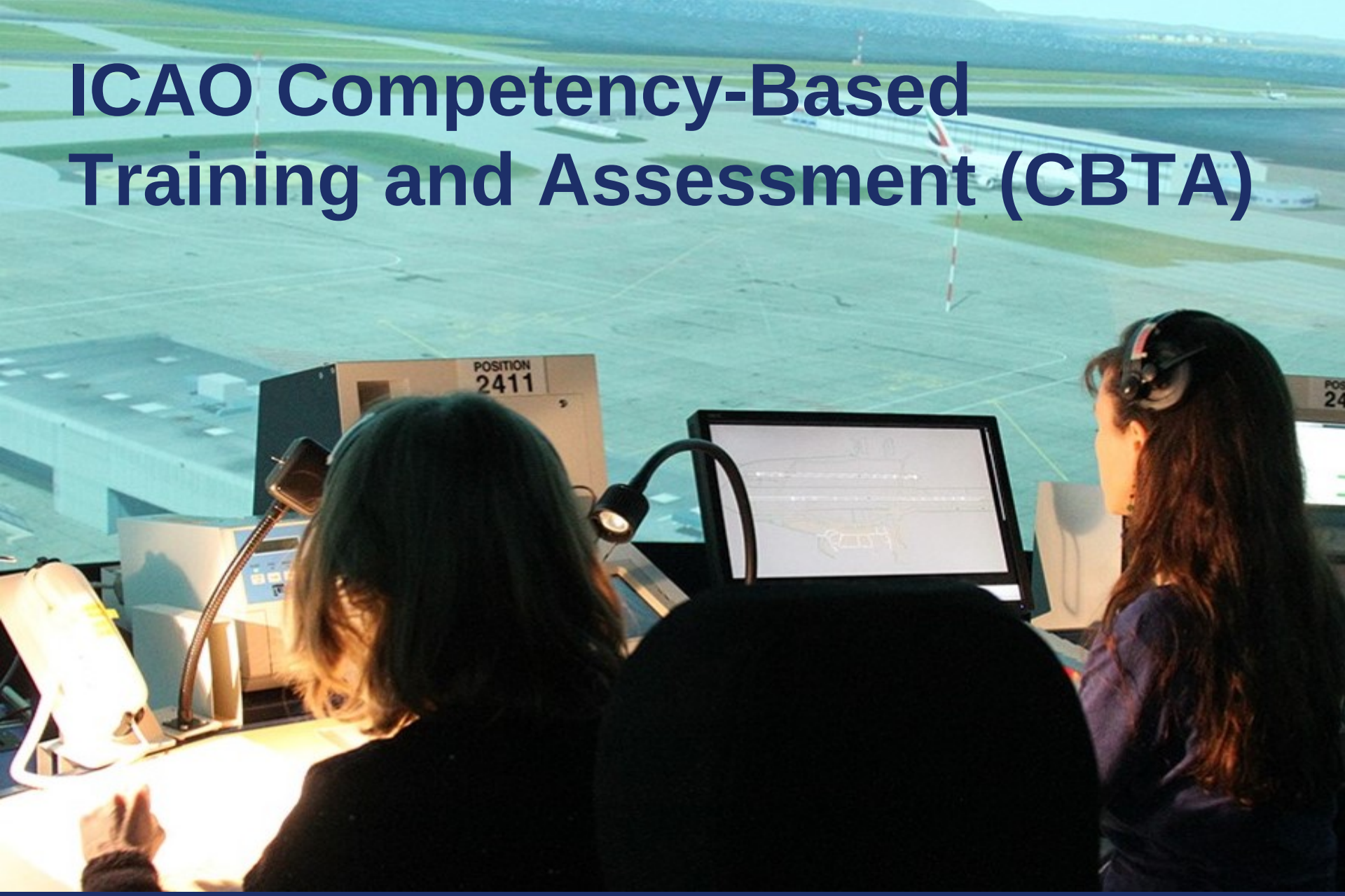
CTO Examiners

- **CTO Examiners:**
  - Required to possess a current medical clearance
  - Required to hold or have held a CTO certificate with a facility rating
  - Determine whether applicants for CTO certificates meet eligibility requirements
  - Administer the Airman Written Test for CTO and facility rating tests
  - Conduct skills evaluations
  - Process CTO applications

Recordkeeping

- **Recordkeeping is an important component of a personnel licensing program**
- **Licensing records should:**
  - Be available on demand
  - Be searchable
  - Be accessible and transparent to stakeholders (regulator and designees, if applicable)
- **Consider a web-based management system with built-in automation functions**
  - Automate reminders, notifications, and alerts

ICAO Competency-Based Training and Assessment (CBTA)



Background

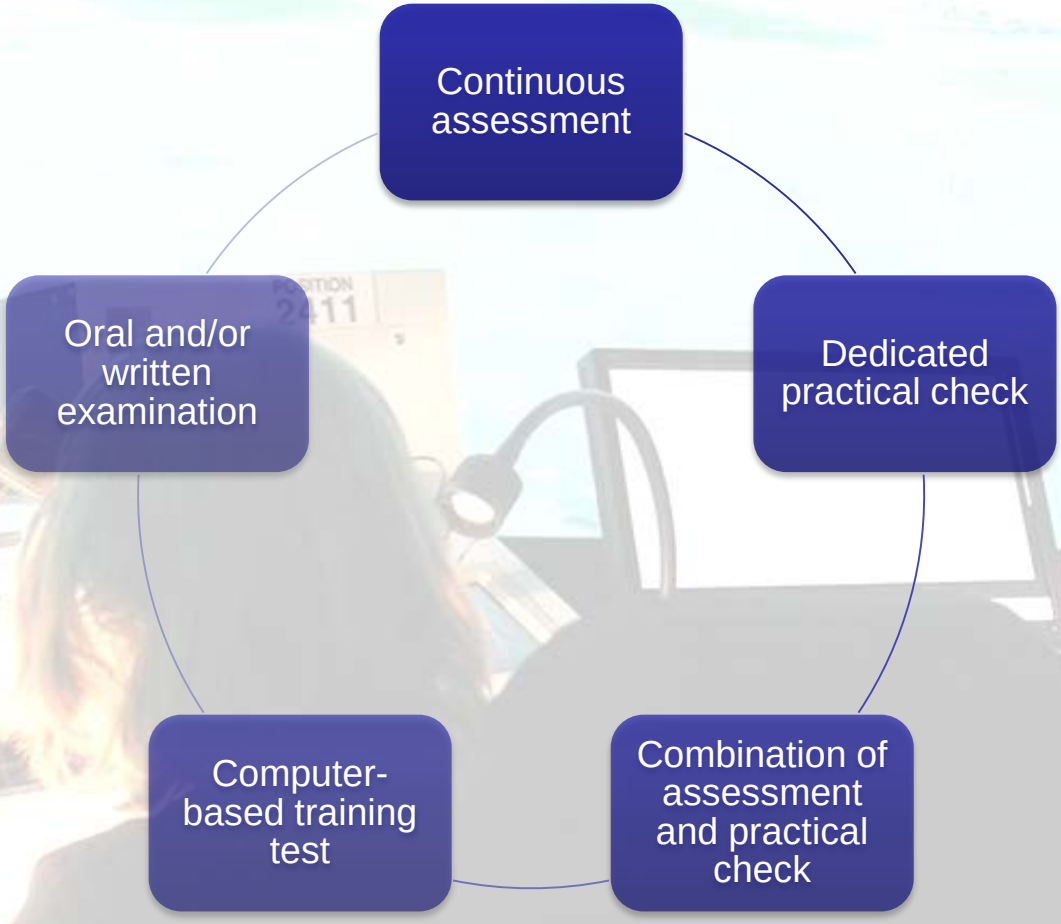
- The ICAO PANS-TRG, Doc 9868 establishes the requirements for aviation personnel to meet and maintain their qualifications.
- Amendment 5 to the PANS-TRG will require a change to a civil aviation authority's approach to training
  - Outcome-based to a competency-based training approach.
- Compliance deadline for ATCOs/ATCSS of **November 5, 2020**

What is Competency?

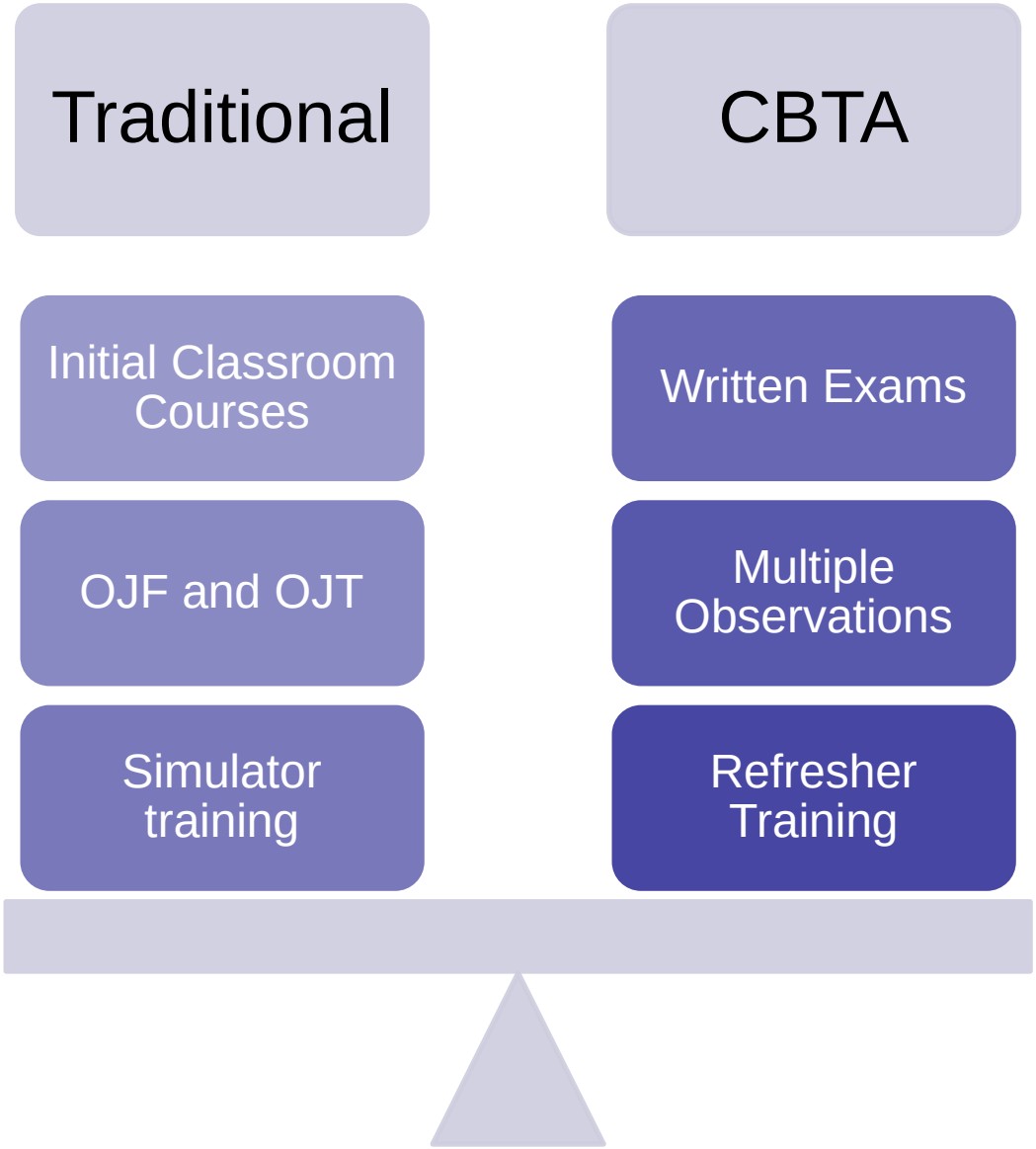
- **ICAO defines competency as a dimension of human performance that is used to reliably predict successful performance on the job. A competency is manifested and observed through behaviors that mobilize the relevant knowledge, skills and attitudes to carry out activities or tasks under specified conditions.***

*Competency-Based Training and Assessment Presentation at the High Level Seminar on LOC-I and UPRT, Johannesburg, South Africa, 19 October 2017.

What is CBTA?

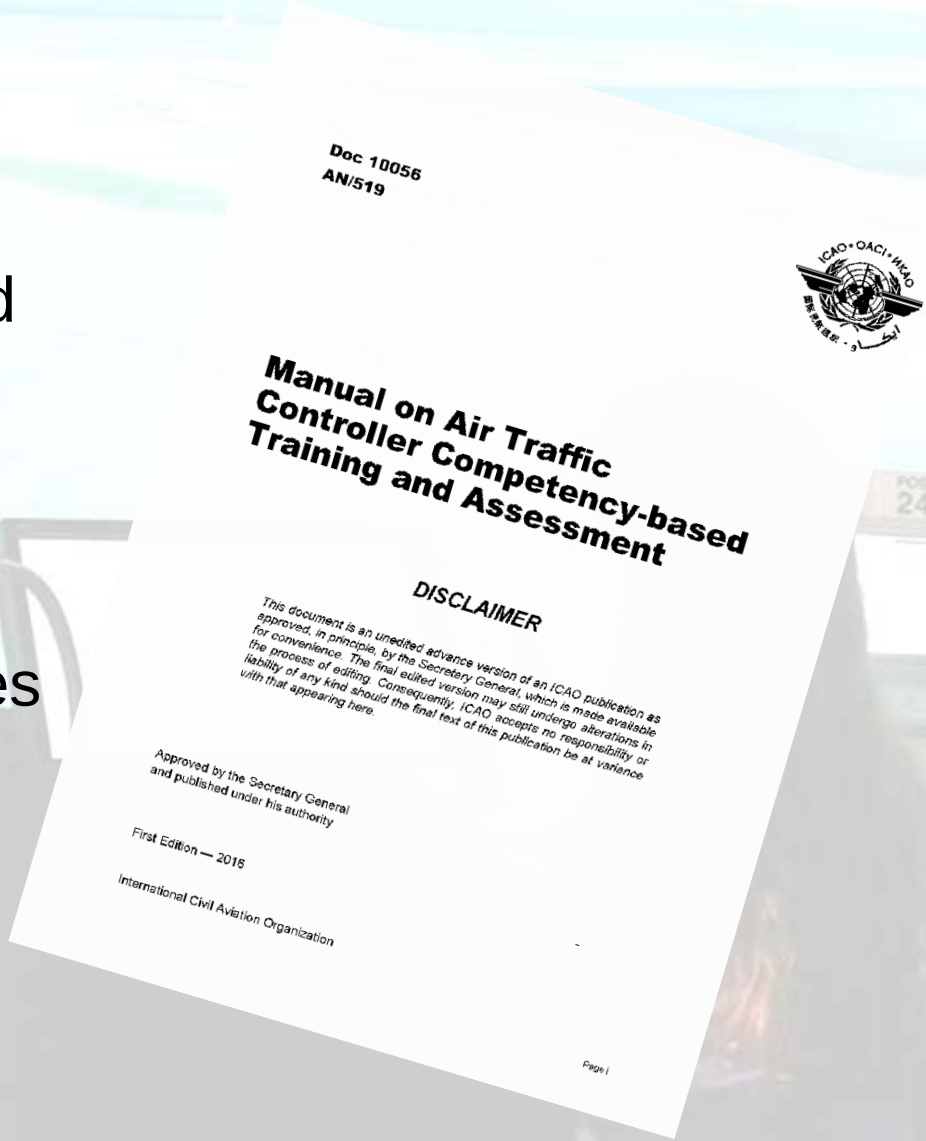


International Federation of Air Traffic Controllers' Associations (IFATCA), 57th Annual Conference, Accra, Ghana, 19-23 March, 2018, Working Paper 156: Competence Assessment, presented by the Professional and Legal Committee (PLC).


Traditional
CBTA
Initial Classroom Courses
OJF and OJT
Simulator training
Written Exams
Multiple Observations
Refresher Training

CBTA

- The CAAs must develop and apply CBTA to the current training program for ATCOs and ATSEPs to comply with the new training Standards and Recommended Practices (SARP).



Compliance deadline:
November 5, 2020

Applying CE 6 to ANS Oversight

- **Licensing, Certification, Authorization and Approval obligations:**
  - There are currently no ICAO requirements for certification of air navigation service providers
  - States must ensure ANSP compliance with international Standards related to ANS

Example: FAA Baseline

- **FAA Order 1100.161 accepted the status of the U.S. National Airspace System (NAS) as the baseline as of March 2005**
  - This means that the existing system was accepted as the starting point for oversight of safety in the NAS
  - Further guidance is provided in FAA Safety Oversight Circular (SOC) 07-01

Certification of an ANSP

- **Key considerations for certification**
  - **Clearly define nature of Service Providers (SP) Operation?**
    - **ATS, CNS, AIS, MET, SAR**
    - **National, multinational, multiple certificates**
  - **Implementation of common requirements**
    - **Develop line of sight to international and nation standards**
  - **Establish agreement between the SP and CAA**
    - **What are the conditions for achieving and maintaining a certificate**

Certification of an ANSP

- **Demonstration and assessment of compliance**
  - **Develop tailored checklists based on common requirements**
    - **Use as the basis for an initial certification**
    - **Use as the basis for periodic reviews of the SPs ability to continuously meet the provisions of the certificate**
    - **Demonstration for the SP to meet standards (Operational, Organizational, Safety)**
    - **Formal ability for Authority to regulate (i.e. modify, revoke) certificate**

FAA Example: Certification of an ANSP

- **The FAA does not "certify" its ANSP (ATO)**
  - **On March 14, 2005, FAA Order 1100.161 accepted the U.S. National Airspace System (NAS) as the baseline (current system's state) for safety oversight**
  - **From that point the use of SMS Safety Risk Management (SRM) to assess all changes to the NAS was established with the goal of full SMS implementation by March 14, 2010**
  - **Five year implementation plan**
    - **Hazards contained within the March 14, 2005 are not "grandfathered" in any way and, if detected must be mitigated to an acceptable level**

FAA Example – Certification of an ANSP

- **AOV Approved the ATO SMS in 2010**
  - **Conducted full assessment of all four SMS components**
  - **Identified gaps and areas for improvement (SRM & Safety Assurance)**
  - **Used as the basis for follow-up surveillance activities (2012)**
  - **Recent use of Safety Management International Collaboration Group (SM ICG) SMS Evaluation Tool for assessment of upcoming 2nd amendment to Annex 19**

What would be some benefits of certifying your State's ANSP?

Systems Safety Approach

- **A systems safety approach requires safety to be an inherent part of the operational system**
  - The policies, procedures, and practices used by the service provider are integral to the safety of the system
- The systems safety approach dictates continuous improvement
  - Safety-related data is captured regularly, analyzed for trends or hazards, and systems are changed to reduce or eliminate safety risk decisions that potentially have a safety impact

Systems Safety Approach

- **Strategies to implement a systems safety approach to safety oversight:**
  - Identify regulator and service provider safety-related roles and responsibilities
  - Mandate accident, incident, and occurrence reporting
  - Require service provider(s) to establish a safety organization
  - Require service provider(s) to implement SMS*
  - Assess and monitor SMS implementation*
  - Manage change by engaging “early and often”*

Strategies for Certification, Authorization and Approval

- **Consider adopting a systems safety approach**
- **Distinguish among high, medium, and low-risk activities**
  - Focus on high-risk changes and issues
  - Allow service providers to manage medium and low-risk activities

ANSP Safety Organizations

- **The service provider is responsible for safe operations**
- **A dedicated safety unit 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 (ATO) 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 (regulator/oversight authority) primary liaison to the ATO (service provider)

FAA Example: Establish Standards

- **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:
Approval/Acceptance/Concurrence (A/A/C)

- **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
- **The A/A/C process enables AOV to prioritize, evaluate, and process requests from the ATO and other external organizations**

FAA Example: A/A/C

- **The following types of changes/proposed actions require *approval* by the Air Traffic Safety Oversight Service:**
  - Mitigations for high-risk hazards
  - Changes that affect separation minima
  - Changes that involve multiple FAA Lines of Business

FAA Example: A/A/C

- **The Air Traffic Safety Oversight Service *accepts* the following types of changes/proposed actions:**
  - Mitigations for medium and low-risk hazards
  - Changes that do not affect separation minima, such as:
    - Changes to phraseology
    - Changes to training that do not alter the requirements for the Credential holder

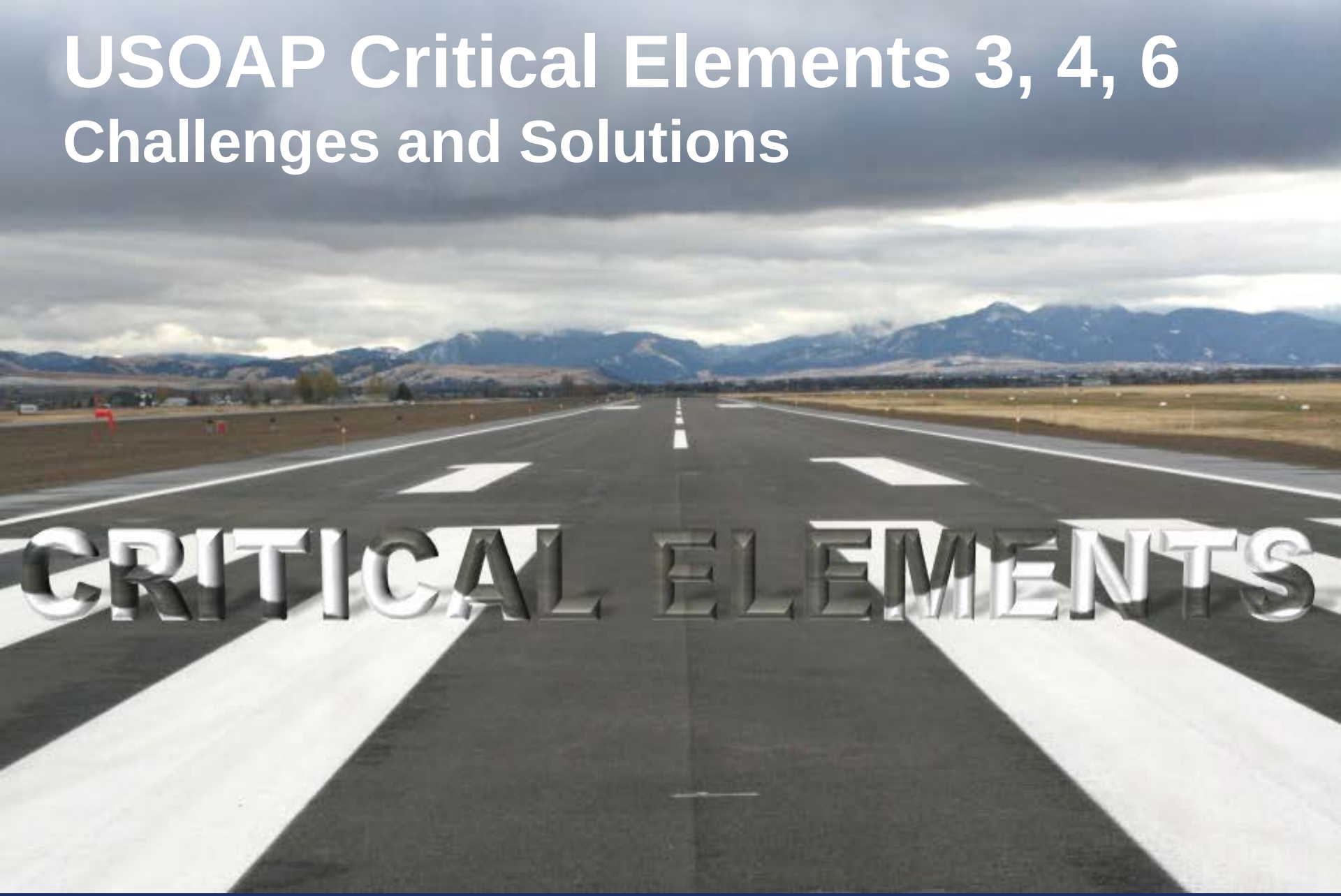
FAA Example: A/A/C

- **The Air Traffic Safety Oversight Service requires review of the following types of actions for *concurrence*:**
  - Responses to independent safety recommendations
  - Proposed differences to be filed with ICAO

References

- **FAA Order 1100.161**
- **FAA Order 8000.90**

USOAP Critical Elements 3, 4, 6
Challenges and Solutions



CE 3 – Challenges

- **How do I recruit technical experts?**
  - How can I compete with industry salaries?
- **How do I retain qualified personnel?**

Recruitment and Retention Strategies

- **Consider offering non-salary incentives**
  - Tuition assistance
  - Flexible work arrangements (e.g., telework)
- **Build a strong leadership development program**
  - Individual Development Plan
  - Support participation in employee associations
  - Mentoring programs
  - Competitive employee development programs
    - Pipeline to management opportunities

CE 4 – Challenges

- **How do I ensure quality training for air traffic safety inspectors?**
- **How do I pay for training?**

Training Strategies

- **Refer to ICAO training standards and framework**
  - Identify core competencies for personnel
  - Identify qualified training providers, e.g. ICAO TRAINAIR Plus
- **Create an annual training plan**
  - Needs assessment
  - Required pre-requisites for training
- **Keep training records**
  - Repeating training unnecessarily costs money!

Training Strategies

- **Establish a dedicated training budget for technical personnel**
- **Develop training instructors from the cadre of experienced technical staff**
  - Train-the-trainer
- **Maximize available funds through a combination of distance and classroom training**
  - CBT/web-based training
  - Coordinate annual training needs assessments and plans with neighbor States
    - Pool students and share costs for classroom training

CE 6 – Challenges

- **How do I manage a large licensing program with a (relatively) small staff?**
- **How do I identify safety oversight priorities?**
  - What is high risk?
  - Where should I focus my approvals?

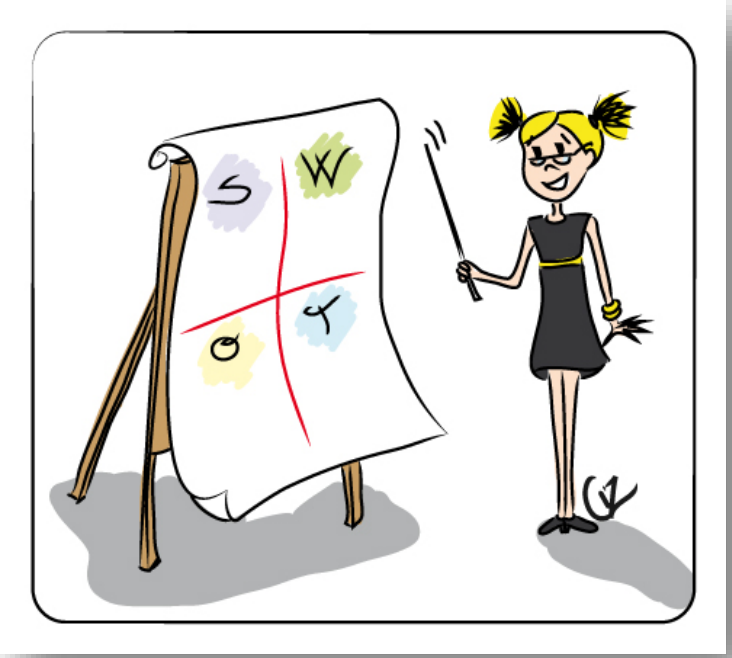
Strategies for Risk-Based Safety Oversight

- **Leverage service provider personnel**
  - Design and manage designee program
  - Utilize automation
    - Monitoring status of licenses
    - Notifications and alerts
    - Link job performance with licensing system
- **Adopt a risk-based decision making model**
  - Proposed changes that are identified as high risk or medium risk by service provider
  - Activities that involve multiple stakeholders

Activity

SWOT Analysis[1]…

Critical Elements 5 and 6



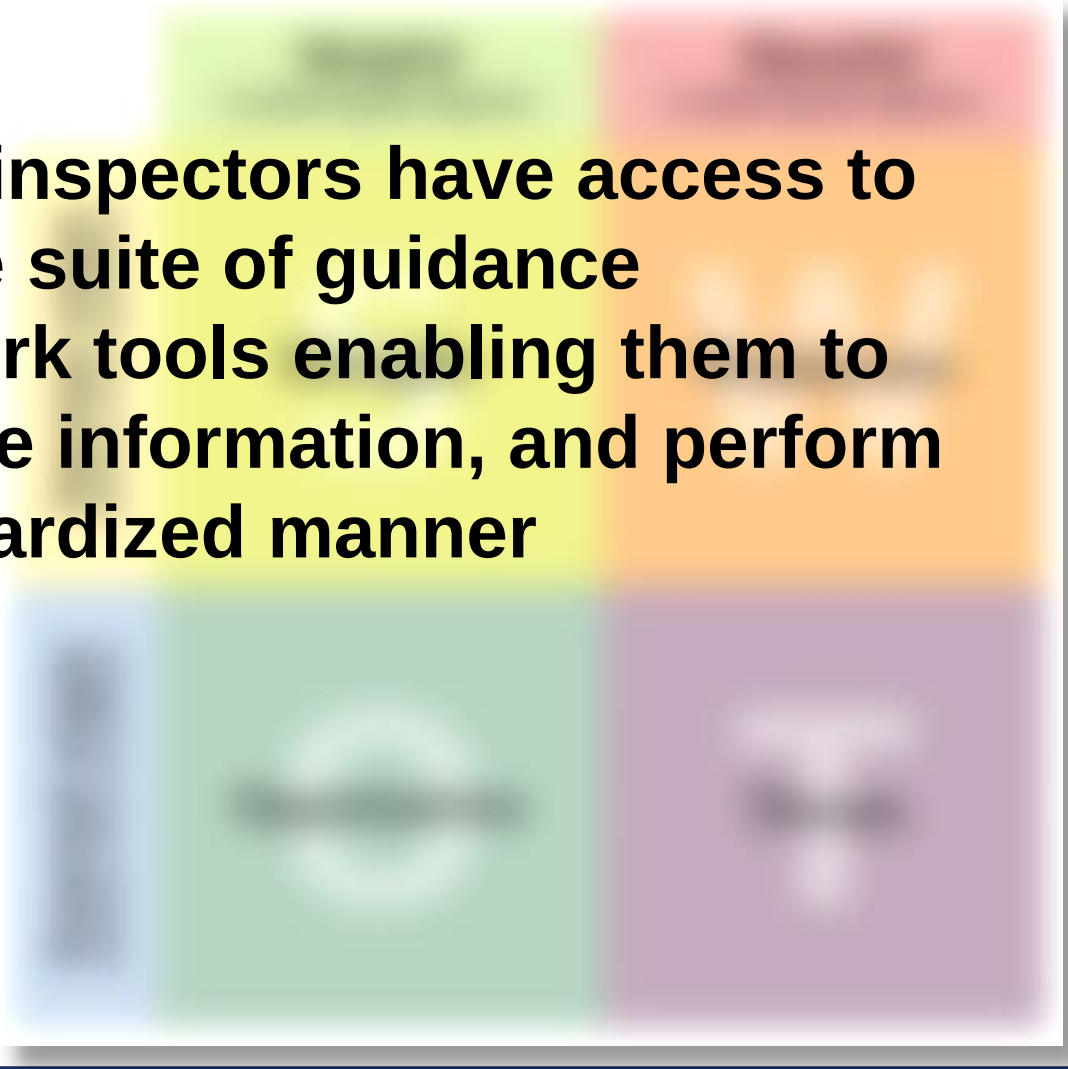
[1] Innovation Games (www.innovationgames.com)

SWOT Analysis Activity

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

CE 5 – Ideal End State

- **Air traffic safety inspectors have access to a comprehensive suite of guidance materials and work tools enabling them to collaborate, share information, and perform duties in a standardized manner**



CE 6 – Ideal End State

- **The air traffic safety oversight organization has created a framework to license safety-critical personnel in accordance with Annex 1 and issue approvals to ANSP(s)**
  - Develop licensing eligibility criteria
  - Issue licenses
  - Maintain airman database

Activity Instructions

1. **Assemble in groups**
    1. Group 1 and Group 2: CE-5
    2. Group 3 and Group 4: CE-6
2. **Choose a facilitator/recorder (timekeeper)**
3. **Access the SWOT Analysis Worksheet**
4. **Work together to complete a SWOT analysis for CE 5 and CE 6**
5. **Prioritize to identify the best ideas**
6. **Report on your discussions**

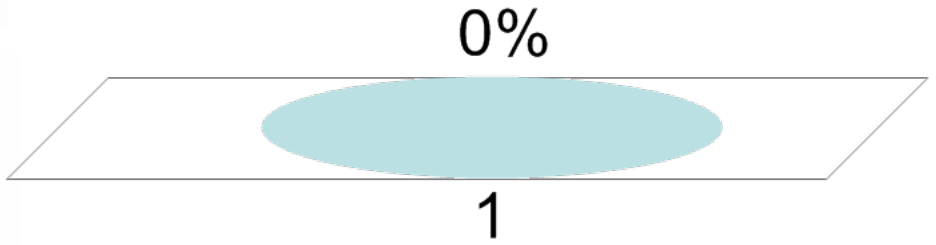
SWOT Analysis Worksheet: Critical Element 5

Ideal End State: Air traffic safety inspectors have access to a comprehensive suite of guidance materials and work tools enabling them to collaborate, share information, and perform duties in a standardized manner.

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?

Questions about today's material or activities?

Rank	Responses
1	
2	
3	
4	
5	
6	




135
90
QUESTIONS?