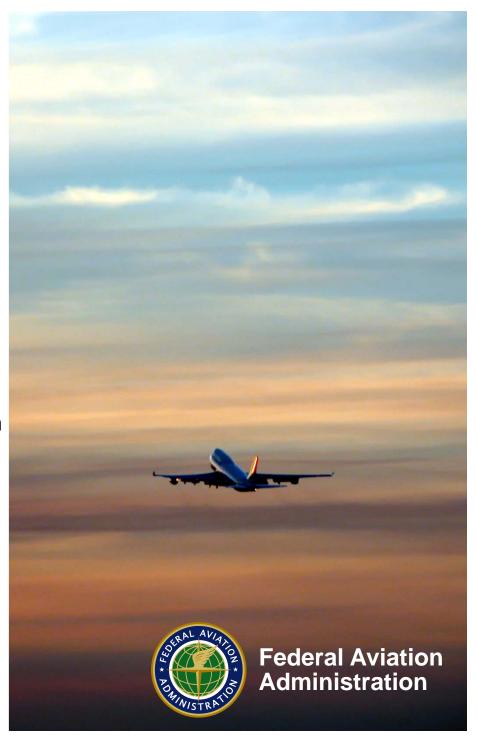# USOAP Critical Element 4

Technical Personnel Qualification and Training

Presented to: ICAO NACC Region

By: Federal Aviation Administration

Date: February 20-24, 2017

Federal Aviation Administration

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 air traffic safety oversight inspector workforce is capable of conducting effective surveillance of air traffic services in a standardized manner.**

Applying CE 4 to Air Traffic Oversight

Qualified Personnel

Training Program

Career Progression

Safety Oversight Workforce

Applying CE 4 to Air Traffic Oversight

- **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**

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

Strategies to Recruit Qualified Personnel

- **Engage personnel office 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:** AOV Air Traffic Control Specialist
- **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

Example: CAA Botswana

- **Position:** Senior Inspector ATM & AIS
- **Key qualifications:**
  - Successfully completed and rated in aerodrome, approach, approach radar, area, and area radar
    - Government Safety Inspector course a plus
  - At least 3 years experience in aviation-related organization including senior ATC position, *or*
  - At least 5 years as an Aeronautical Information Services Officer
  - Good communication and interpersonal skills
  - Good problem solving skills
  - Proactive and decisive
  - Innovative and initiative

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

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

- **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?

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

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
  - Nature and Traits of Teams
  - Structure of Audit Teams
  - Audit Topic Identification
  - How to Be a Regulator
  - Developing the Audit
  - Conducting the Audit
  - Post-audit activities, report writing, and record retention

FAA Example: Initial Technical Training

- **Participation in a "practice" audit**
  - After completing the Audit Skills course, students work together in teams to conduct a mock audit according to the Air Traffic Safety Oversight Service audit process
  - Instructors provide feedback on student work

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**
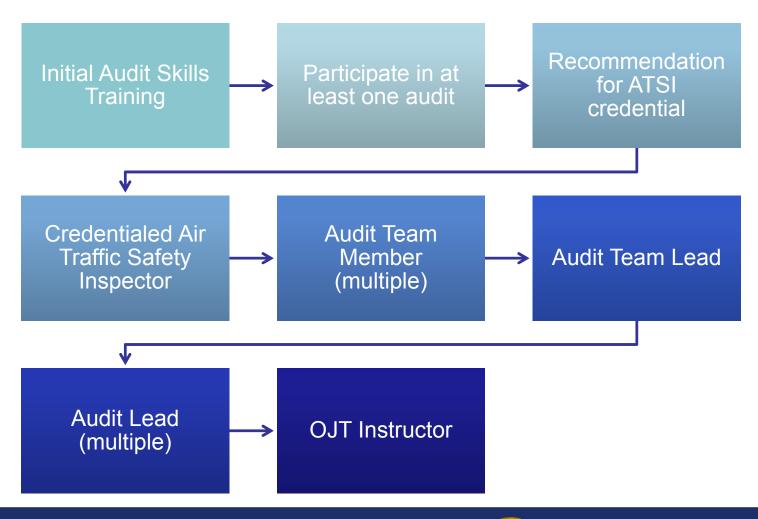 - Enable employees to keep pace with changes in the industry

Developing Future Leaders

- **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: 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
  - OJT Instructor
- **Inspectors receive training for these roles from OJT Instructors (OJTI)**
- **Progression requires peer (OJTI) and management recommendation**

FAA Example: ATSI Progression

Initial Audit Skills Training → Participate in at least one audit → Recommendation for ATSI credential

Credentialed Air Traffic Safety Inspector → Audit Team Member (multiple) → Audit Team Lead

Audit Lead (multiple) → OJT Instructor

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 Branch Manager and On-the-Job Training (OJT) Instructor**
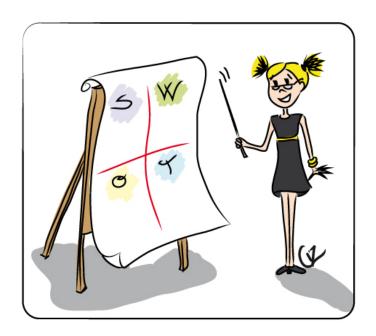
Overcoming Workforce Constraints

- **Train and utilize designees**
- **Leverage available data and Safety Management System outputs (safety risk analyses and safety assessments) to focus on areas of greatest risk**

References

- **Job Announcement: AOV Air Traffic Control Specialist**

- **Job Announcement: CAA Botswana Senior Inspector ATM & AIS**

Activity

SWOT ANALYSIS[1]…

CRITICAL ELEMENTS 3 AND 4

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

SWOT Analysis Game

- **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/)

Review: CE 3 and 4

- **Critical Element 3:**
  - The establishment of a CAA and/or other relevant authorities or government, supported by the appropriate and adequate technical and non-technical staff and provided with adequate financial resources

- **Critical Element 4:**
  - 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

CE 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

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

Activity Instructions

1. Assemble in groups
2. Choose a facilitator/recorder
3. Access the CE 3 SWOT Analysis grid
4. Work together to complete a SWOT analysis for CE 3
5. Prioritize to identify the best ideas
6. Repeat for CE 4
7. Report on your discussions

SWOT Analysis Outcomes

- **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/)

Activity

Start – Stop – Continue[1]…

Stop
Continue
Start
Mrs. E Teaches Math

1. **Develop an objective based on your SWOT analysis for CE 3 or 4, to achieve the Ideal End State**

2. **Complete a Start-Stop-Continue worksheet**
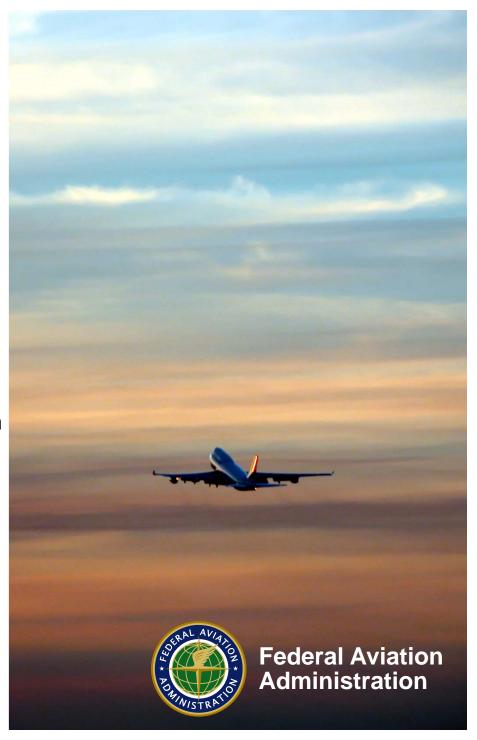
[1] Gamestorming (www.gamestorming.com)

USOAP Critical Element 5
Technical Guidance and Tools

Presented to: ICAO NACC Region

By: Federal Aviation Administration

Date: February 20-24, 2017

Federal Aviation Administration

Critical Element 5

- **Technical guidance, tools and the provision of safety-critical information**
    - The provision of technical guidance (including processes and procedures), tools (including facilities and equipment) and safety-critical information, as applicable, to the technical personnel to enable them to perform their safety oversight functions in accordance with established requirements and in a standardized manner.
    - This includes the provision of technical guidance by 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.**

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
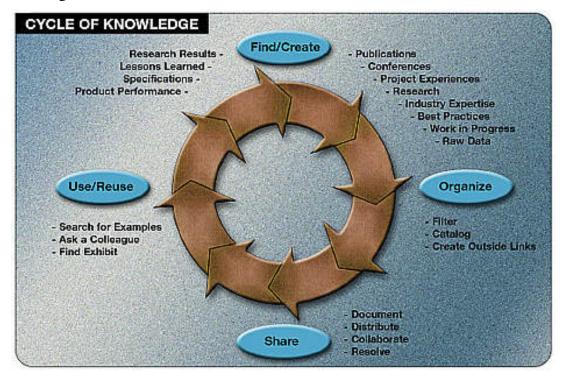 - A means of providing guidance to ANSPs

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)

Cycle of Knowledge

- **Large organizations don't always know what they know!**

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)

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
    - Support knowledge management
    - Be updated regularly – outdated guidance materials are not useful!

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

Best Practices for Effective SOPs

- **Engage employees to update guidance materials 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 9000**
- **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

- **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 Tools

- **AOV Oversight Portal**
  - Web-based portal for secure and efficient analysis and integration of safety information
  - Users can create customized dashboards to display relevant information
  - Integrates other AOV oversight tools
- **Credentialing system**
  - Web-based personnel licensing management system
  - Training portal for designees
  - Automation features

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
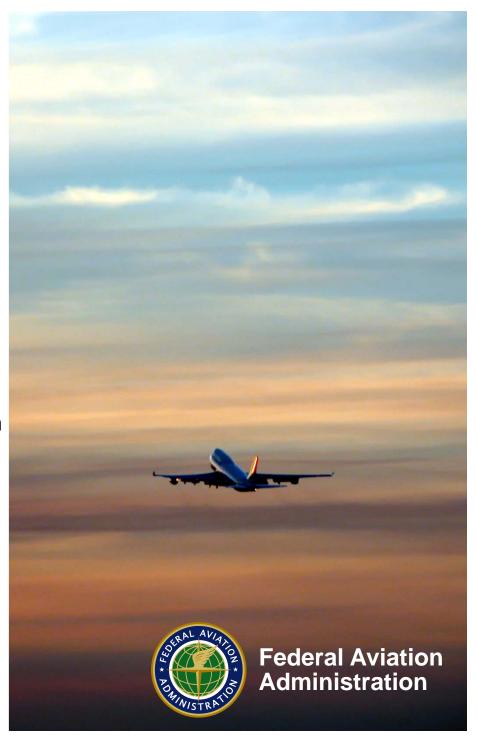
USOAP Critical Element 6

Licensing, Certification, Authorization and Approval Obligations

Presented to: ICAO NACC Region

By: Federal Aviation Administration

Date: February 20-24, 2017

Federal Aviation Administration

Critical Element 6

- **Critical Element 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.

- **The regulatory authority must ensure that air navigation services personnel are licensed according to proficiency and responsibilities**

- **The regulator must also ensure that service providers meet performance and safety obligations**

Personnel Licensing Obligations

Applying CE 6 to Air Traffic 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 Air Traffic Oversight

- **A licensing program for air navigation services 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**

Useful Licensing Strategies

- **Establish a dedicated licensing staff in the air traffic oversight organization**

- **Utilize web-based management tools**

- **Leverage service provider management personnel**

  - Require facility managers to work on the regulator's behalf in the issuance of licensing by making it a term of his or her employment

- **Ensure that controllers* cannot work without a license**

Useful Licensing Strategies

- **Consider periodic evaluations to ensure controllers continue to hold the skills they need to do their jobs**

- **Consider tying the renewal of ratings to additional training**

  – Look for trends in the ANSP performance to find topics for enhancements to training

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
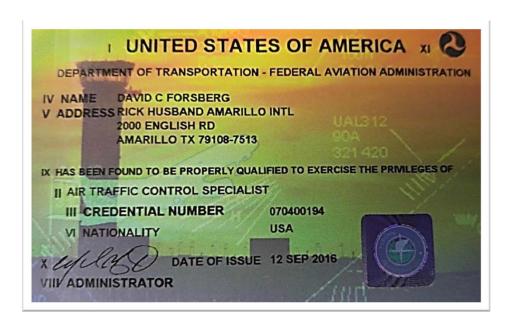
FAA Example: Credentialing Program

- The Air Traffic Safety Oversight Service Credentialing Program covers personnel who perform direct safety-related air traffic control services and/or certify systems/subsystems/services in support of the U.S. National Airspace System
  - Air Traffic Controllers
  - Airway Transportation Systems Specialists (ATSEP/maintenance technicians)
  - Aeronautical Information Specialists

FAA Example: Credentialing Program

- **The Air Traffic Safety Oversight Service (AOV) modeled its Credentialing program on the FAA Mechanic and Repairman Certification programs**

  – AOV manages the Credentialing Program by authorizing designated personnel in the service provider to perform certain functions

FAA Example: Credentialing Program

- **The AOV Credential meets international licensing requirements contained in Annex 1**
  - Does not contain any personal/privacy-sensitive information, such as date of birth

FAA Example: Credentialing Designations

- **Designations:**
  - Proficiency Manager
  - Co-Proficiency Manager
  - Designated Examiner
- **Designations are only valid while an individual holds a managerial position**
- **Some positions in the FAA Air Traffic Organization require individuals to hold a credential with a Proficiency Manager designation**

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

FAA Example: Air Traffic Controller Credential Ratings

- **Tower**
  - Issued to controllers who work in a Tower
- **Radar Approach Control**
  - Issued to controllers who work at a TRACON
- **En-route**
  - Issued to controllers who work at an Air Route Traffic Control Center
- **Ratings are location-specific**

FAA Example: ATSEP Credential Ratings

- **FAA Airway Transportation Systems Specialist (ATSS – maintenance technicians/ATSEP) ratings include:**
  - Communication
  - Navigation Aid
  - Surveillance
  - Environmental
  - Automation
- **A rating authorizes the holder to certify one or more systems/subsystems/services in support of the U.S. airspace system**
  - Ratings align with specialized training disciplines

FAA Example: AIS Credential

- **AOV issues credentials to Aeronautical Information Specialists (AIS)**
  - The credential ensures AIS practitioners demonstrate proficiency in a common set of competencies
  - **Ratings:**
    - Graphic Design
    - Aeronautical Information Publication Management
    - Aeronautical Information Processing
    - Digital Terminal Design
    - Procedure Design
    - Vertical Obstruction
    - Airport Mapping

Credentialing U.S. Military Controllers

- **AOV now issues the FAA Air Traffic Controller Credential to U.S. Department of Defense (DoD) air traffic controllers**
  - FAA credential replaces the certificate formerly issued to military controllers
  - Follows same designation processes and includes same ratings as AOV credentials issued to FAA air traffic controllers
  - Program includes annual verification that DoD air traffic controller training meets FAA standards

FAA Example: Control Tower Operator Certificate

- **Issued to individuals who do not hold an AOV 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

FAA Example: CTO Designations

- **Designations:**
  - Proficiency Manager
  - Co-Proficiency Manager
  - CTO Examiner

Proficiency Manager Designation

- **Authorizes a Facility Manager or District Manager to:**
  - Designate CTO Examiners and ensure Examiners meet qualification standards
  - Monitor CTO Examiner activities and competence
  - Ensure CTO facility-rating tests are developed and maintained
- **Proficiency Managers may carry out both Credential Program and Control Tower Operator Certification Program responsibilities**

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

FAA Example: 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

FAA Example: CTO Facility Rating

- **The facility rating test includes the following elements:**
  - Control tower equipment and its use
  - Weather reporting procedures and use of reports
  - Notices to Airmen, and use of the Airman's Information Manual
  - Use of operational forms
  - Performance of non-control operational duties
  - Procedures applicable to individual operating positions

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

Certification, Authorization and Approval Obligations

Applying CE 6 to Air Traffic Oversight

- **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

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

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"*

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: 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 Approval/Acceptance/Concurrence (A/A/C) process enables AOV to prioritize, evaluate, and process requests from the ATO and other external organizations**

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: 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

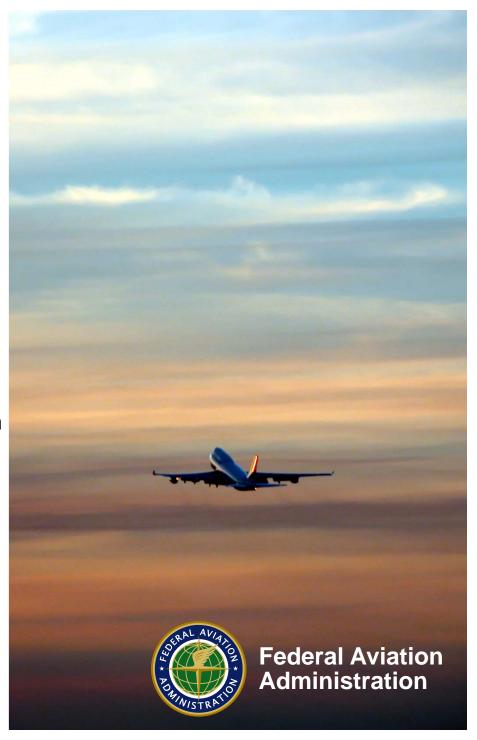- **FAA Order 1100.161**
- **FAA Order 8000.90**

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

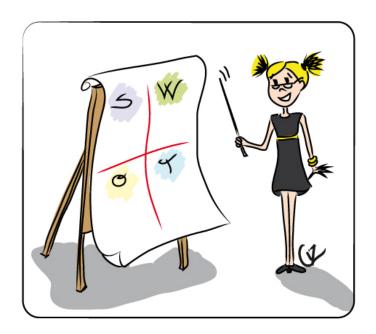- **Leverage service provider personnel**
  - Design and manage designee program
  - Utilize automation
    - Monitoring status of licenses
    - Notifications and alerts
    - Link job performance with licensing system
- **Adopt a risk-based decision making model**
  - Proposed changes that are identified 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 Game

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

	Helpful to achieving the objective	Harmful to achieving the objective
Internal origin (attributes of the organization)	**S** Strengths	**W** Weaknesses
External origin (attributes of the environment)	**O** Opportunities	**T** Threats

Review: CE 5 and 6

- **Critical Element 5:**
  - The provision of technical guidance (including processes and procedures), tools (including facilities and equipment) and safety-critical information, as applicable, to the technical personnel to enable them to perform their safety oversight functions in accordance with established requirements and in a standardized manner

- **Critical Element 6:**
  - 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 licence, certificate, authorization and/or approval to conduct the relevant aviation activity

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

2. Choose a facilitator/recorder

3. Access the CE 5 SWOT Analysis grid

4. Work together to complete a SWOT analysis for CE 5

5. Prioritize to identify the best ideas

6. Repeat for CE 6

7. Report on your discussions