Boeing Safety Management Overview

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Agenda

- Boeing Aviation Safety Overview
- Boeing Participation in FAA Design & Manufacturing SMS Pilot Project
- Boeing Repair Station SMS Implementation
- Key Messages
Boeing safety leadership
Working together for a safe, efficient global system

- Promote worldwide safety culture
- Aligned focus
- Promote proactive risk management
- Knowledge sharing
- Data driven
- Cooperation
- Assure healthy safety foundation

DESIGN | BUILD | OPERATION | MAINTENANCE | INFRASTRUCTURE | REGULATION

Safety Integration Across the Value Stream

ECCN: 9E991
Boeing works collaboratively and at a product level to make sure flying is as safe as possible

Aviation safety is the combined result of:
- Regulatory oversight
- How airplanes are designed and produced
- How crews operate and maintain them
- How air traffic and airport infrastructure support them

Boeing uses robust processes to produce safe products.

Airplane-level safety assessment:
- Configuration selection
- Firm concept
- Program launch
- PDR
- System FHA
- FHA: functional hazard assessment
- FMEA: failure mode & effects analysis
- FTA: fault tree analysis
- PASA: preliminary airplane safety assessment
- Common cause analysis
- Preliminary FTA
- Common mode & resource assurance analysis
- Hardware software/mechanical systems

Boeing continuously monitors performance of worldwide fleet.

In-service safety process:
- Data sources
- Accident data
- Incident data
- Other in-service events
- Operator reports
- Suppliers
- Employee reporting
- FAA engagement
- FAA action
- Data management
- Issue identification
- Issue classification (safety decision)
- Issue resolution (corrective action)
- Service action
- Compliance recommendation
- Service letters
- Multi-operator message
- Fleet team Xchange
- Continued Operational Safety Program

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Boeing’s Participation in FAA Design and Manufacturing (D&M) SMS Pilot Project

- Boeing used a certificate-based organizational approach to conduct SMS gap analyses
  - Pilot Project focused on Type and Production Certificates, but considered potential impact on other Boeing Certificates

- FAA D&M SMS Pilot Project
  - Type Certificate
  - Production Certificate
  - Continued Airworthiness
  - FAA D&M SMS Pilot Gap Analysis
  - Safety Policy & Objectives
    - (31) FAA Criteria (SM ICG (52) Criteria)
  - Safety Risk Management
    - (9) FAA Criteria (SM ICG (28) Criteria)
  - Safety Assurance
    - (17) FAA Criteria (SM ICG (20) Criteria)
  - Safety Promotion
    - (4) FAA Criteria (SM ICG (19) Criteria)

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D&M organizational process and procedures designed to produce a compliant, conformed product

- Changes to organizational processes or procedures require validation that they will still produce a compliance, conformed product
- Data sources (in-service etc.) are used to identify organizational issues requiring corrective action to produce a compliant, conformed product
Boeing Learning’s from FAA D&M SMS Pilot Project

- Annex 19 has addressed the issue of equivalency or reciprocal recognition of SMS by different authorities for D&M
  - made acceptable to the State of design or manufacture
- Need consistent evaluation criteria (gap analysis) to allow for efficient SMS implementation for large organizations with multiple aviation products and services
- Scope and treatment of organizational hazards needs to account for existing design and manufacturing certification processes
- D&M sector specific guidance material is needed
- D&M relevant SMS safety performance indicators are needed
- Knowledge and experience from the D&M industry should be used to help develop sector specific guidance and policy
- Need to address readiness of regulatory oversight
Boeing Repair Station
Safety Management System (SMS) Development

Boeing Repair Station is required to develop/deploy an SMS to satisfy current/future Civil Aviation Authorities (CAA) regulations:

- Bermuda Department of Civil Aviation (BDCA); timeline established for U.S. certified Repair Station (January 2013)
- Japan Civil Aviation Bureau (JCAB) in support of recertification audit (March 2013)
- Civil Aviation Administration of China (CAAC); foreign Repair Station application (ECD 2014)
- Brazilian National Civil Aviation Agency (ANAC) in support of a change in regulations (ECD 2014)
- Australian Civil Aviation Safety Authority (CASA) in support of new regulations (ECD TBD)
- Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA); timelines not currently defined (ECD TBD)

Boeing Repair Station conducted gap analysis using ICAO SMM and available guidance material to satisfy BDCA, JCAB, and CASA regulations (requirements/expectations)
Various differences between ICAO SMM and BDCA, JCAB, and CASA requirements/expectations

- 46 differences between ICAO, BDCA, JCAB, and CASA
Safety Management System
Reliance on Quality Management System (QMS)

- Boeing’s Repair Station SMS utilizes Quality Management System (QMS)
  - QMS monitors for discrepancies
  - Safety discrepancies dealt with via the SMS and quality discrepancies dealt with via the QMS system
  - SMS re-enforces the safety-just culture to encourage voluntary and confidential discrepancy reporting

- For compliance purposes Boeing’s Repair Station SMS “manual” is separate from it QMS manual
  - Single SMS “manual” used to satisfy all regulatory standards
Boeing Repair Station

SMS Development -- Lessons Learned

- Need management commitment
- Need to develop Subject Matter Experts (SMEs) to support SMS implementation, deployment, and maintenance efforts
  - Numerous external training providers -- need consistency
  - Benefit from internal training developed -- emphasize organization’s unique considerations
- Utilize an approach to maximize safety enhancement
  - Need one acceptable standard for all authorities
  - Use existing processes, systems, and tools as much as possible
  - Use the knowledge of others (e.g., internal/external benchmarking)
  - Keep it simple – practical application
Boeing Safety Management

Key Messages

- Need one acceptable standard for all authorities
  - Need ICAO and other aviation regulatory authorities to promote overall international regulatory harmonization
  - Leverage reciprocal agreements to minimize administrative activities that do not provide a commensurate safety benefit

- Need to involve industry in development of safety performance indicators that are relevant to sector specific products or services

- Authorities need to be ready for SMS oversight

Boeing will remain engaged in the development and evolution of aviation sector-specific safety management best practices
Thank You

Questions?