



---

# 2003 Cabin Safety DER Conference

Seattle Aircraft Certification Office  
November 6, 2003

# Introduction

---



# Welcome

# Agenda



## AM Session

- Introduction – T. Stafford
- ANM-150S Organization – S. Lennon
- Organization, Roles, DER Assign- S. Lennon
- SACO Activities- S. Lennon
- Streamlining Seat Certification – R. Kaufman
- Draft Policies – R. Kaufman
  - ✍ Component Tests §§ 25.785 (b), (d)
  - ✍ Use of Surrogate Parts  
§§ 25.562 (c)(5) and 25.785 (b), (d)
  - ✍ TC/TSO Seat Issue Resolution
  - ✍ Advisory Circular 25.785-1X
- New Policies – T. Stafford
  - ✍ IVS Abuse Load Testing
  - ✍ AC 20-146
  - ✍ FAA Endorsement of ARP 5526
- Inflatable Lap Belts – T. Barth
  - ✍ Design, Test, Certification

## PM Session

- Globalization Issues – G. Panger
- AN64 Policy – S. Lennon
- Title 14 CFR 25.613- D. Wren
- Management DER's- D. Crotty
- Questions & Discussion – D. Crotty/K. Ladderud

## PM Session (Boeing Only)

- Interior PSP- S. Lennon
- GALA- G. Panger
- Discussion/Question- T. Stafford



---

# Cabin Safety Staff and Current Assignments

Shannon Lennon  
Seattle ACO, ANM-150S

# Cabin Safety Staff

---



## Contact Information:

Dave Crotty	david.crotty@faa.gov	425-917-6422
Patrick Gillespie	patrick.gillespie@faa.gov	425-917-6429
Dan Jacquet	daniel.jacquet@faa.gov	425-917-6431
Bob Kaufman	robert.kaufman@faa.gov	425-917-6433
Keith Ladderud	keith.ladderud@faa.gov	425-917-6435
Shannon Lennon	shannon.lennon@faa.gov	425-917-6436
George Panger	george.panger@faa.gov	425-917-6444
Sue Rosanske	susan.rosanske@faa.gov	425-917-6448
Tom Stafford	thomas.stafford@faa.gov	425-917-6449
Don Wren	donald.wren@faa.gov	425-917-6451

# Cabin Safety Assignments

---



## Primary Assignments:

Dave Crotty	FSI focal, 757 delivery focal, 747 backup
Patrick Gillespie	Part 23, 27, 29 & 31 Products, PMAs, 737/757 backup, COS focal
Dan Jacquet	Goodrich DAS OMT, Lifeport focal
Bob Kaufman	777 delivery focal, JAMCO backup
Keith Ladderud	AIM & Cascade focal, 737-600 thru -900 delivery focal
Shannon Lennon	Acting senior engineer, Boeing Interior PSP focal
George Panger	Boeing TS&M focal, 7E7 focal, GALA focal, 767 backup
Sue Rosanske	707/727/737 classic focal, 767 delivery focal, Britax backup
Tom Stafford	Britax focal, NAT focal, 7E7/777 backup
Don Wren	747 delivery focal, JAMCO focal

# DER Assignments

November 2003



---

**Dave Crotty:** Steve Adams,  
Chris Damgaard, Jerry Johnson,  
Dana Krueger, James Park,  
Kernan Scott, Brent Walton

**Patrick Gillespie:** Marwan Sayegh

**Dan Jacquet:** Russell Alleman,  
Dave Barton, Pliny Brestel,  
Greg Cummings, Jeff Flick, Kris Haugen,  
Tim Hughes, Gilberto Imamura,  
Tom LeBlanc, John Miller

**Bob Kaufman:** Tim Alvarez, David Carr,  
Ken Davis, George Iverson,  
Masamichi Kato, Andy Muth,  
Dave Neher, Atuo Sato, Bruce Wallace

**Keith Ladderud:** Brian Brannock,  
Virinder Duggal, Sun Gil Kim,  
Bob Lenaburg, Jonathon Knopp,  
Diane Sandwick, Rick Schiefelbein

**Shannon Lennon:** Matt Anglin,  
Eric Essman, John Ho,  
Ray Rydberg, Mike Scholz,  
Christine Thompson, Gary Weiss

**George Panger:** Michelle Albert,  
Paul Etzkorn, Susan Glicksberg,  
Tom Graham, Kent Porter,  
Martin Spencer, Nick Wantiez,  
Andy Wright

**Sue Rosanske:** John Blinne, Bill Hudson,  
James Peterson, John Rood,  
Tom Stoner, Dave Weale

**Tom Stafford:** David Barrett, Gary Ferson,  
Ed Hulineck, Darrel Noland, Ray Priestley,  
Duane Skipworth, Joann Tsethlikai,

**Don Wren:** James Cusworth, Tom Dorrance,  
Jim Goss, Layton Walker, Ken Young

# DERs Contacting the FAA

---



- 1<sup>st</sup> - If you have a question related to a specific project, contact the ACO project engineer.
- 2<sup>nd</sup> - Contact the FAA backup.
- 3<sup>rd</sup> - Contact your advisor for general guidance issues, but not if it is related to a specific project.
- 4<sup>th</sup> - Contact the Senior Engineer.



---

# Streamlining Seat Certification

Bob Kaufman

Seattle Aircraft Certification Office

# Background Congressional Bill / Law

## HR1000 / PL 106-181



### "SEC. 757. STREAMLINING SEAT AND RESTRAINT SYSTEM CERTIFICATION PROCESS AND DYNAMIC TESTING REQUIREMENTS.

- (a) WORKING GROUPS.- Not later than 3 months after the date of enactment of this Act, the Administrator shall form a working group comprised of both government and industry representatives to make recommendations for streamlining the seat and restraint system certification process and the 16g dynamic testing requirements under part 25 of title 14, Code of Federal Regulations, to focus on reducing both the cost and the length of time associated with certification of aircraft seats and restraints.
- (b) REPORT. - Not later than 1 year after the date of enactment of this Act, the Administrator shall transmit to Congress a report on the findings of the working group."

- Chartered by Act of Congress; is now Public Law - PL 106-181
- Purpose is to streamline seat and restraint system certification
- Target 50% reduction in cost and flow time
- FAA / Industry working together over past 2½ years to develop and implement '4-Part Plan'

## FAA and Industry '4-Part Plan'

1. Conduct a critical review of current seat certification policies to ensure that they are within the bounds of the regulations, and establish a system to actively manage compliance policy.
2. Re-establish the Seat TSO as a valid design approval.
3. Utilize suppliers' local authorities for gathering and acceptance of seat certification data.
4. Promote acceptance of alternate methods of compliance to reduce cost and/or enhance safety through application of new technologies.



Streamlining Seats and Restraint System Certification

FEBRUARY 22<sup>nd</sup>, 2001

# FAA and Industry 4-Part Plan



## Streamlining Seat Certification

### Objectives

- Uphold safety
- Reduce cost
- Reduce flow time

### 1. Review and Actively Manage Compliance Policy

Conduct a critical review of current seat certification regulation and policies and establish a system to actively manage compliance policy.

### 2. Re-establish Seat TSO

Re-establish the Seat TSO as a design approval.

### 3. Utilization of Local Authorities

Utilize suppliers' local authorities for gathering and acceptance of seat certification data.

### 4. Promote Alternate Methods of Compliance

Promote acceptance of analytical methods and component test methods to reduce the need for full-scale testing.

# Streamlining Seat Certification Leadership Team



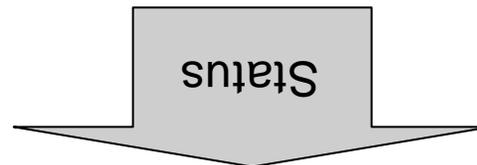
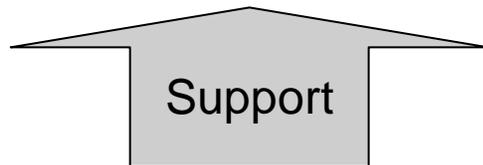
**Program Managers**  
John Piccola, Rick Baggette

**Part 1  
Policy Task Team**  
Bill Schultz  
Jim Cashdollar

**Part 2  
TSO Task Team**  
Raki Islam  
Hal Jensen

**Part 3  
Local Authorities  
Task Team**  
Nathan Wilson  
Jim Cashdollar

**Part 4  
Alternate Methods  
Task Team**  
Terence Lim  
Mike Thompson / Van Gowdy



## Charter Team

Bill Schultz (Chairman) – GAMA, Ali Bahrami (Co-Chairman) - FAA, Dave Hempe – FAA AIR-100,  
Russ Benson / Tim Holey – Boeing, Vahe Bilezikjian – B/E Aero, Frank Heming – Goodrich Aero  
Ronda Ruderman - AFA, Fernon Clark – American Airlines

# Part 1 - Actively Manage Compliance Policy

---



- Conduct a critical review of seat and restraint system certification procedures to ensure that FAA and industry resources are expended on those activities that product the greatest benefit:
  - Conduct a formal audit of certification regulations and policy to ensure that the guidance reflects the intent of the regulations and that it was developed and applied via a public process
  - Take steps to either publicly process guidance that was incorrectly adopted or withdraw such guidance

# Part 1 - Actively Manage Compliance Policy

---



- Underlying Principles for Part 1
  - Policy is within the bounds and intent of regulations
  - Clear policy provides guidance, simplifies compliance determinations, and establishes a level playing field
  - Public input should be gathered during the development of generic policy or guidance
  - Policy needs to be readily accessible both by Industry and seat certifying authorities (FAA RGL)
  - Training needs to be provided to ensure understanding of policy

# Part 1 – Actively Manage Compliance Policy

---



- Finalized Policy and Guidance
  - Offset Armrests
  - IVS Abuse Load Testing
  - Corded Devices
- Policy memos promote streamlining goals
  - Cost reduction
  - Flow time reduction
  - Simplified compliance determinations

# Part 1 - Actively Manage Compliance Policy

---



- In-work Policy and Guidance
  - Means of Compliance for satisfying the HIC requirements for each (a range of) occupant(s)
  - Conducting component level tests to demonstrate compliance with §§ 25.785(b) and (d) [seatback delethalization]
  - Seat mounted literature pockets and stowage compartments
  - Tests for in-arm video monitors (part of AC 25.562-1( ))

# Part 1 - Actively Manage Compliance Policy

---



- Formal Seat Policy Audit
  - Generally applicable policy is listed on FAA RGL website
    - [www.airweb.faa.gov/rgl](http://www.airweb.faa.gov/rgl)

# Part 1 - Actively Manage Compliance Policy

---



- In-work Policy and Guidance
  - Advisory Circular (AC) 25.562-1( )
    - Methods of compliance for HIC which address a range of occupants, have delayed AC publication

## Part 2: Re-establish the seat TSO as a valid design approval

---



- Recognize the validity of TSO seat approval and the boundaries of that approval.
- Revise TSOs to increase their utility for meeting airworthiness regulations.
  - Updating TSO based on revised industry standards.
- Initiate program to allow the TSO process to account for certain installation issues.

# FAA to establish procedures for resolving seat issues between installation and TSO ACOs

---



- Establish a methodology for reporting seat discrepancies between all stakeholders in the seat certification process.
- Standardize a process for resolving those discrepancies.
- Identifies recurrent discrepancies and leads to resolution of systemic problems.
  - Establish standardized content and industry recommended format for Installation Instructions and Limitations (IIL) for TSO-C127a.

# Part 3 – Utilization of Local Authorities

---



- Utilize seat supplier's local authorities for gathering and acceptance of seat certification data.
- Premise:
  - It's more efficient for a local manufacturer and their authority to oversee data collection activities and conduct supplier oversight.
  - Reduced travel costs.
  - Improves process flow time.

# Part 3 – Utilization of Local Authorities

---



Improve efficiency by eliminating redundant approvals, and by providing accountability and ownership at all levels.

- Domestic

- Utilize Partnership for Safety Plans (PSP) and project specific certification plans (PSCP) to collect certification data.

- International

- BASA/IPA provides framework for reliance on other countries certification systems
- Utilize FCAA capabilities and delegation systems wherever practicable

# Part 4: Alternate Methods of Compliance

---



## Objective

- Develop new methods of demonstrating compliance with § 25.562 that will reduce certification cost and streamline seat certification.

## Seat streamlining activities for FY03

1. Development and publication of AC 20-146
  - This AC provides a means of demonstrating compliance using computer modeling techniques.
  - The computer models require validation based on dynamic tests.
2. Development of a HIC component test device
  - The device is being developed at CAMI.
  - Industry is participating in its development.
  - The device is intended to streamline seat certification by reducing, to the maximum extent possible, the number of full scale HIC tests required.

# HIC Component Test Device



# Part 4: Alternate Methods of Compliance

---



3. Development of a method to allow a surrogate part to be used in lieu of a seat back mounted accessory during blunt trauma tests.
  - Examples of accessories: video monitors, telephones
  - Seat back mounted accessories are typically destroyed during blunt trauma tests.
  - A policy memo will allow surrogate parts (such as an aluminum plate) to be used during testing so that accessories are not destroyed.
  
4. Development of a method of compliance for replacing seat cushions without conducting full scale dynamic tests.



---

# Conducting Component Level Tests to Demonstrate Compliance with §§ 25.785(b) and (d)

Bob Kaufman

FAA – Transport Standards Staff

# Component Tests - § 25.785

---



- Policy Statement No. ANM-03-115-31 published in FR on July 22, 2003.
  - Comment period closed October 30, 2003.
  - Policy designed to provide a simplified method of testing seatback mounted components such as video monitors, telephones, etc.
  - Not meant to require assessment of traditional foam/cloth seatbacks and tray tables.

# Component Tests - § 25.785

---



- Policy statement provides compliance methods for evaluating blunt trauma injuries resulting from § 25.561 crash loads.
  - Not applicable to airplanes whose certification bases include compliance with § 25.562(c)(5), i.e., HIC.
- Policy supercedes guidance contained in AC 25-17 regarding the bowling ball test.
  - Comparative testing options removed.
  - Absolute criteria added.
  - Each potentially injurious item must be assessed.

# Component Tests - § 25.785

---



- Other methods of compliance identified in AC 25-17 can still be utilized.
  - Padding potentially injurious surfaces.
  - Relocating injurious objects outside of the headstrike zone.

# Component Tests - § 25.785

---



- Blunt trauma injuries can be evaluated using three different test methods.
  - Bowling ball test
  - Head component tester (HCT)
  - Free motion headform (FMH)
- All methods use essentially the same pass/fail criteria.

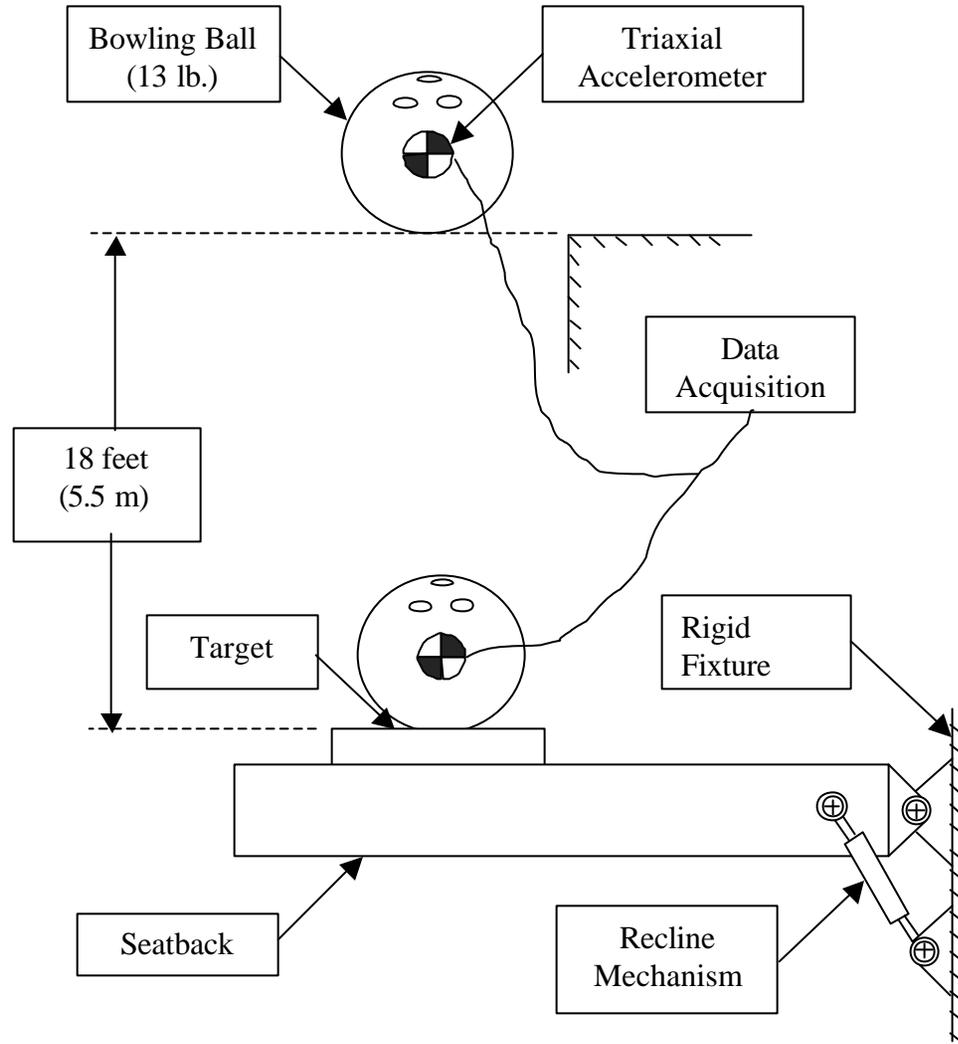
# Component Tests - § 25.785

---

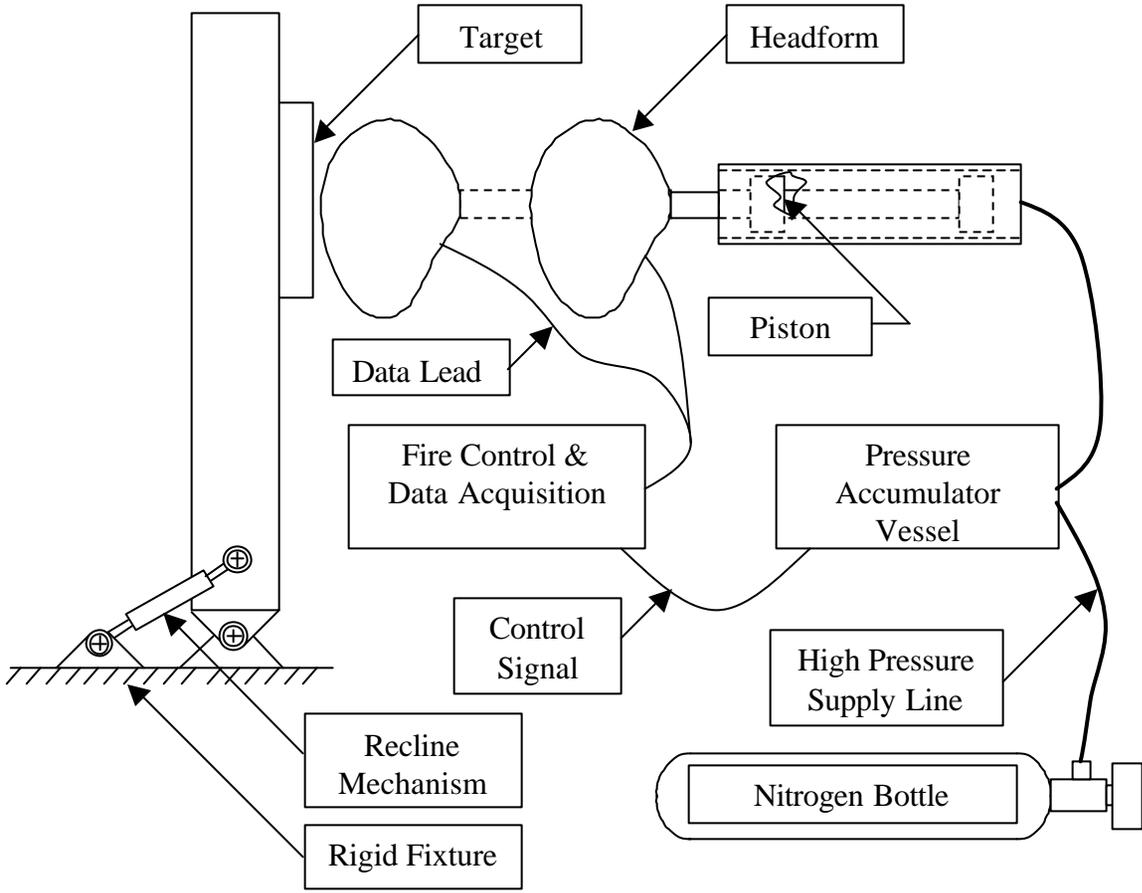


- Test Criteria
  - 34 ft./sec. minimum impact velocity.
  - Accelerations cannot exceed 200g's peak, nor have a cumulative duration greater than 80g's for more than 3.0 milliseconds.
  - No sharp or injurious edges or features can be created as a result of the impact test.

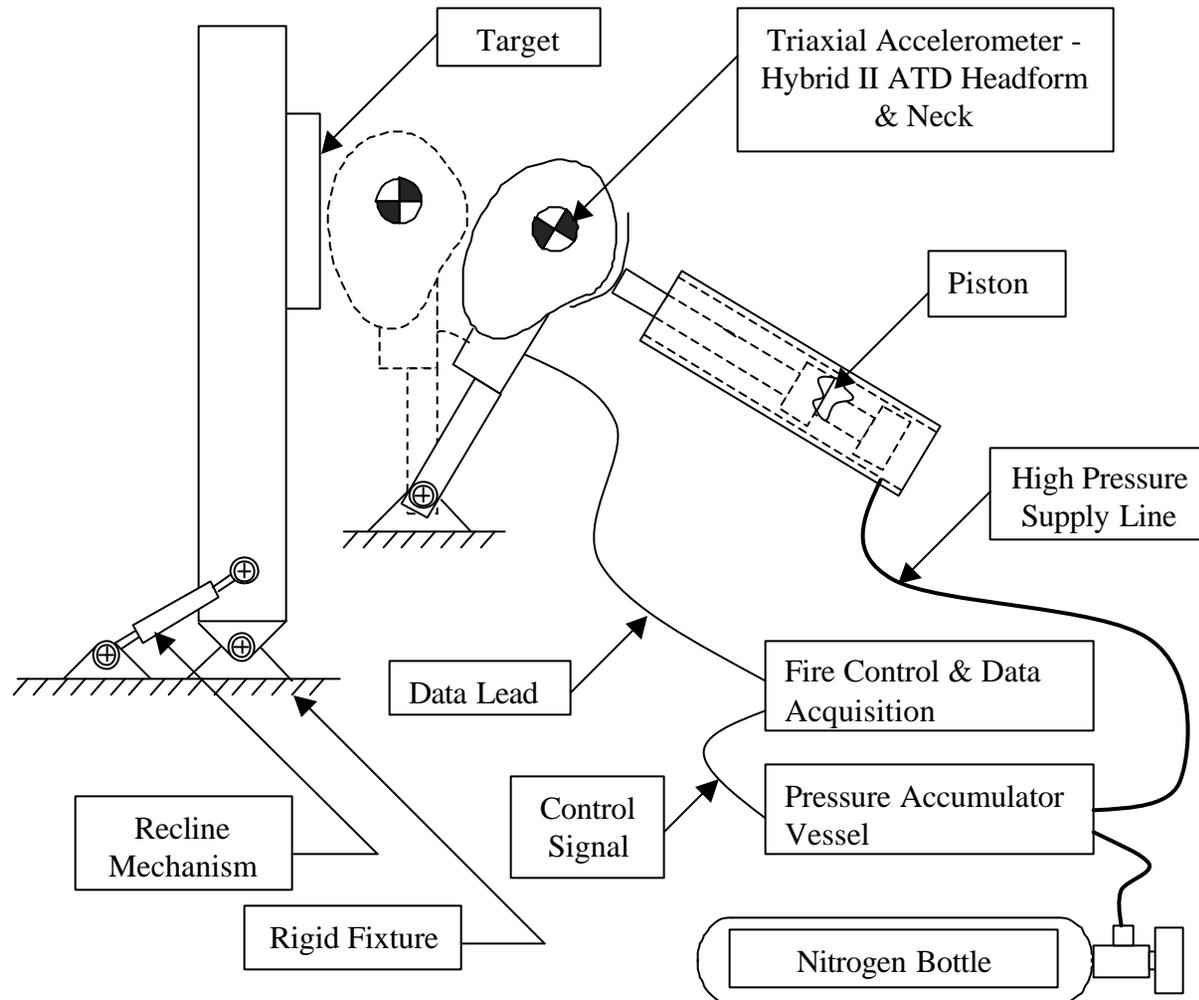
# Bowling Ball Test



# Free Motion Headform



# Head Component Tester



# Utilization of Surrogate Parts for Blunt Trauma Testing

---



- Seat back mounted accessories are often installed within the striking radius of seated passenger's heads.
- Examples of seat back mounted accessories: video monitors, telephones
- Part 25 requires a certain level of protection from head injury due to impacts against these accessories.
  - § 25.562(c)(5): HIC must not exceed 1000
  - § 25.785(b): The seat must be designed to prevent serious injury during an emergency landing.
  - § 25.785(d)(2): Injurious objects within the striking radius of the head must be eliminated.

# Utilization of Surrogate Parts

---



- Currently, testing is conducted with the accessories or parts similar in construction to accessories.
- Accessories are impacted during testing and typically damaged.
- Draft policy memo allows a rigid surrogate part to be used in lieu of these accessories.

# Utilization of Surrogate Parts

---



- Baseline surrogate part
  - 6061-T4 Al plate of minimum thickness 0.238” or a plate of equivalent rigidity
  - Provides a critical case test
    - More rigid than typical accessory
    - Dissipate less energy during impact
  - Chosen based on industry input
    - No data required for its acceptance ? expedite policy issuance
    - Readily accessible
- Policy memo indicates that less rigid surrogate parts may also be acceptable
  - Data may be required
  - Should be approved by issue paper or policy memo

# Utilization of Surrogate Parts

---



- Certification cost reduction/Seat streamlining
  - Accessories will not need to be acquired for testing
  - Reduces certification delays due to the unavailability of accessories for testing
  - Accessories will not be damaged during testing
- FAA is currently dispositioning public comments

# Stowage Compartments and Literature Pockets

---



- Industry has identified a need to better classify stowage compartments and literature pockets.
- Requirements vary:
  - Stowage compartments
    - Usually need to be completely enclosed
    - Use is restricted / weight is limited
  - Literature pockets
    - Not defined in regulations
    - Past practice has been allow a size to accommodate pre-flight safety card, headsets, airsickness bags, in-flight magazine, etc.

# Stowage Compartments and Literature Pockets

---



- Issue: At some point, a literature pocket becomes capable of stowing much more than “literature”.
  - Stowage of laptops, personal items is possible.
  - Some significant items of mass may cause injury resulting from in-flight turbulence, or during emergency landing conditions.
  - Size and location are factors being considered as discriminators.
- Industry is developing a draft proposal
  - Industry leader: Nigel Smith - Britax

# Stowage Compartments and Literature Pockets

---



# Stowage Compartments and Literature Pockets



# Stowage Compartments and Literature Pockets

---

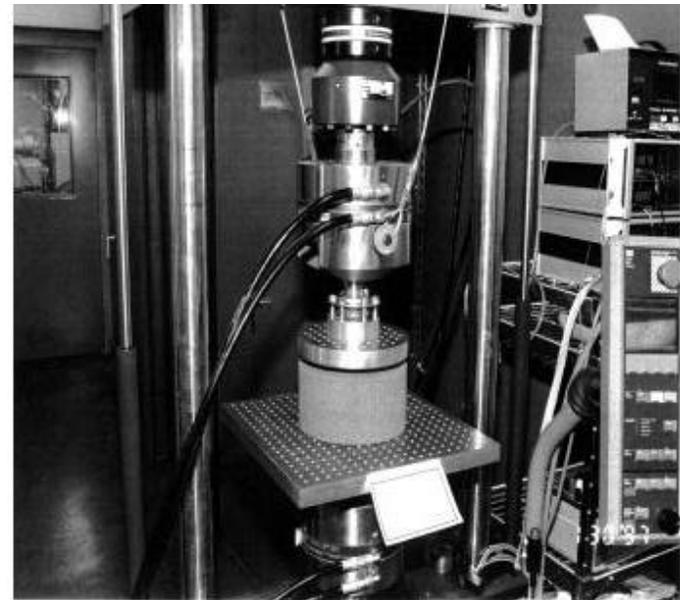
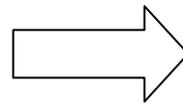


# Seat Cushion Replacement



## Objective

- Replacement of seat cushions on dynamically certified seat by means of a component test
- Eliminate the need to conduct full-scale testing in accordance with 14 CFR25.562(b)



# Seat Cushion Replacement

---



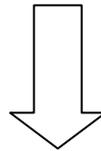
- Potential Applications
  - Seat cushion design changes
  - Change of foam type
  - Retrofit market

# Seat Cushion Replacement

---



## Concept Based on Material Equivalency

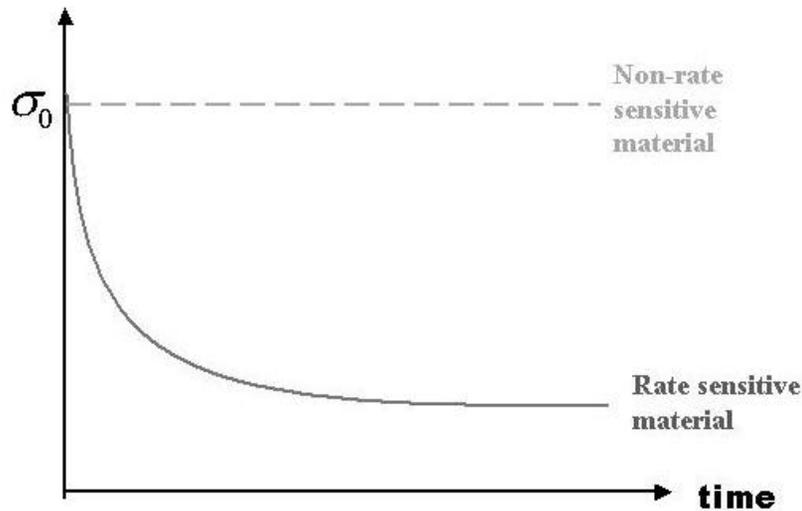


Seat cushion build-ups with similar Force-Deflection properties can be interchanged in a dynamically certified seat

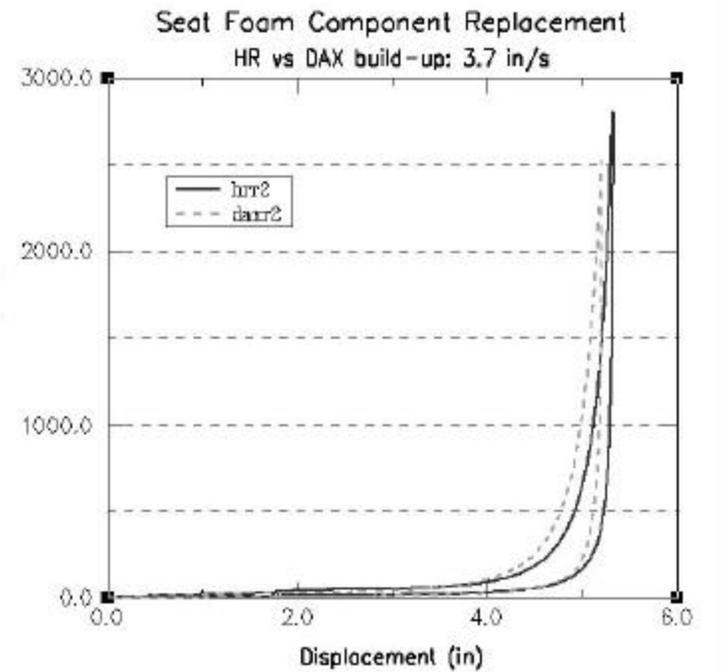
# Seat Cushion Replacement



## Methodology



(a) Conduct load-relaxation test to determine rate sensitivity



(b) Conduct load-deflection test to show similarity

# Seat Cushion Replacement

---



## Current Progress.....

- Industry submitted proposal on seat cushion replacement to FAA in April 2003
- FAA Technical Center funding research to NIAR to validate proposed streamlined test methodology
- Validation results expected in May, 2004



---

Questions?



---

# Regulatory and Guidance Library

# Regulatory and Guidance Library

---



- Website: [www.airweb.faa.gov/rgl](http://www.airweb.faa.gov/rgl)
  - Repository for FAA certification information
  - Provides access to draft and finalized policy.
  - Also contains
    - Regulations, NPRM's
    - Orders, Notices
    - Exemptions
    - Airworthiness Directives
    - Advisory Circulars
    - STC's and Type Certification Data Sheets
- Supports Part 1 of the 4-part Plan by providing easy access to FAA policy.

## The Federal Aviation Administration

[Home](#) [Site Map](#) [DOT](#) [Ask FAA](#) [Search](#)

Best viewed with IE 5.0  
or Netscape 4.7

# Regulatory and Guidance Library



The Regulatory & Guidance Library (RGL) is a set of searchable databases which contain regulatory, guidance and aviation product information. The RGL contains certain Federal Aviation Regulations (FARs) and Special Federal Aviation Regulations (SFARs) from 14 CFR in their current version as well as historical versions. This gives you the ability to assemble certain FAR Parts as they existed at any date in the past (referred to as a Regulatory Basis). The RGL also contains certain Notices of Proposed Rulemaking (NPRMs) and Final Rules (with all preamble explanatory material) which led to the actual Rule changes.

In addition, the RGL contains Make/Model information for all civil aviation products including all current Type Certificate Data Sheets (TCDS); Supplemental Type Certificates; Airworthiness Directives (ADs) both final and proposed; aviation safety Advisory Circulars (ACs) both final and draft; Aircraft Certification Service Orders and Notices; Special Conditions both final and proposed; Exemptions; and Equivalent Levels of Safety.

Select the desired section of the RGL you want to view from the following:

<a href="#">Advisory Circulars</a>	<a href="#">Federal Aviation Regulations</a>	<a href="#">Equivalent Levels of Safety</a>	<a href="#">Special Conditions</a>
<a href="#">-- Draft Advisory Circulars</a>	<a href="#">-- FAR NPRMs</a>	<a href="#">Exemptions</a>	<a href="#">Supplemental Type Certificates (STC)</a>
<a href="#">Airworthiness Directives</a>	<a href="#">-- FAR Final Rules</a>	<a href="#">Orders/Notices</a>	<a href="#">Type Certificate Data Sheets (Make Model)</a>
<a href="#">-- AD NPRMs</a>	<a href="#">Regulatory Basis Tool</a>	<a href="#">Policy</a>	

Go to the [Aircraft Certification Homepage](#)

http://www.airweb.faa.gov/Regulatory\_and\_Guidance\_Library/rgDAC.nsf/MainFrame?OpenFrameSet - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://www.airweb.faa.gov/Regulatory\_and\_Guidance\_Library/rgDAC.nsf/MainFrame?OpenFrameSet Go Links

The Federal Aviation Administration  
[Home](#) [Site Map](#) [DOT](#) [Ask FAA](#) [Search](#)

Best viewed with IE 5.0 or Netscape 4.7

**Search:**

**Search Help**

- ▼ [Draft Advisory Circulars](#)
  - [Open for Comment](#)
  - [Pending Action](#)
  - [All Draft ACs](#)
- [Aircraft Certification Homepage](#)
- [Related Links](#)
- [FAA Section 508 Helpdesk](#)
- [Help](#)

## Draft Advisory Circulars

This database is a searchable repository of certain aviation safety DRAFT Advisory Circulars (ACs). You can view the draft ACs that are currently open for public comment and those that are closed for comment but are still pending final action. For each draft AC, you can view a pdf copy or a full-text version.

http://www.airweb.faa.gov/Regulatory\_and\_Guidance\_Library/rgDAC.nsf/MainFrame?OpenFrameSet - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://www.airweb.faa.gov/Regulatory\_and\_Guidance\_Library/rgDAC.nsf/MainFrame?OpenFrameSet Go Links

The Federal Aviation Administration  
[Home](#) [Site Map](#) [DOT](#) [Ask FAA](#) [Search](#)

**Search:**

**Search Help**

- ▼ [Draft Advisory Circulars](#)
  - [Open for Comment](#)
  - [Pending Action](#)
  - [All Draft ACs](#)
- [Aircraft Certification Homepage](#)
- [Related Links](#)
- [FAA Section 508 Helpdesk](#)
- [Help](#)

## Search Results

\* [Top](#)   [← Previous](#)   [Next →](#)

**1-2 of 2 results for '25.562'**

- [AC 20-xx Methodology for Dynamic Seat Certification by Analysis for Use in Parts 23, 25, 27, and 29 Airplanes and Rotorcraft](#)
- [AC 25.562-1B Dynamic Evaluation of Seat Restraint Systems & Occupant Protection on Transport Airplanes](#)



---

# Streamlining Seat Certification Published Policy

Thomas Stafford  
Seattle ACO, ANM-150S

# Streamlining Seats Certification

---



## Published Policy:

- Seat In-Arm Video Systems (IVS Abuse Load Testing)
- Dynamic Seat Certification by Analysis (Advisory Circular 20–146)
- Use of Aerospace Recommended Practice ARP 5526

# Streamlining Seats Certification

---



## Policy in work:

- **Conducting Component Level Tests to Demonstrate Compliance with §§ 25.785(b) and (d).**
- **Use of Surrogate Parts When Evaluating Seatbacks and Seatback Mounted Accessories for Compliance with §§ 25.562(c)(5) and 25.785(b) and (d).**
- **Component Tests of in-arm monitors**
- **Obtaining TSO-C127a approval after TSO-C39b + aircraft installation approval (Provide status - This item has been ended due to a lack of broad interest by industry).**
- **Seat Stowage Compartment / Literature Pockets Policy**
- **Head Component Testing for HIC**
- **Cushion Component Testing for Lumbar**



---

# In-Seat Video Systems

# Seat In-Arm Video Systems

---



## Policy:

- FAA Memorandums
  - 01-115-32, May 30, 2001
  - 01-115-38, September 12, 2001
  - 02-115-21, November 21, 2002

# Seat In-Arm Video Systems

---



## Policy:

- Applies to 14 CFR's 25.601, 25.785, 25.789 &/or 25.813.
- Provides for use of Industry Standards in Seat Certification
- Specifically ARP 5475
- Simplified documentation

# Seat In-Arm Video Systems

---



## Summary:

- Intent of policy: reduce regulatory burden
- Seat manufacturer statement to be provided to applicant for type design change
- ARP 5475 does not address all part 25 requirements which may be applicable to the system

# Seat In-Arm Video Systems

---



## **Conclusion:** 01-115-38

- When a statement is provided by the seat manufacturer, that the seat has met the pass fail criteria in ARP 5475, it is not necessary for the FAA engineer *or* designee to further review the installation with respect to the issues covered under the scope of ARP 5475.

# Seat In-Arm Video Systems

---



## **Conclusion: 02-115-21**

- When a statement is provided by the seat manufacturer, that the seat has met the pass fail criteria of 25.789 and all deployable IVS item remain stowed, it is not necessary for the FAA engineer *or* designee to further review the installation with respect to the issues covered under the scope of FAA Memorandum 02-115-21 dated November, 21 2002.



---

# Dynamic Seat Certification by Analysis

# Dynamic Seat Certification by Analysis

---



## Policy:

- FAA Advisory Circular 20-146  
Dated 5/19/2003
- Applies to Title 14 Code of Federal Regulations Sections 23.562, 25.562, 27.562, and 29.562
- Provide an acceptable means for demonstrating compliance to § XX.562 by computer model

# Dynamic Seat Certification by Analysis

---



## Policy:

- Computer modeling analytical techniques may be used to
  - Establish the critical seat installation in preparation for dynamic testing
  - Demonstrate compliance to changes to a baseline seat design (baseline seat must have been dynamically tested)



---

# Aerospace Recommended Practice (ARP) 5526

# Aerospace Recommended Practice (ARP) 5526

---



## Policy:

- FAA Memorandums
  - Use of SAE ARP 5526, June 26, 2003
  - Policy Number PS-AIR100-2003-ARP5526

# Aerospace Recommended Practice (ARP) 5526

---



## Policy:

- Apply to aspects of 14 CFR's
  - 25.561, 25.601, 25.789, 25.815, 25.785, 25.787, 25.789, 25.811, 25.813, 25.1411, 25.1541
- Provides for use of Industry Standards in Seat Certification
- Simplified documentation

# Aerospace Recommended Practice (ARP) 5526



<b>Topic</b>	<b>The guidance in ARP5526, paragraph:</b>	<b>can be used to comply with TSO-C39b</b>	<b>can be used to comply with TSO-C127, AS8049, paragraph:</b>	<b>can be used to comply with TSO-127a</b>	<b>can be used to comply with Title 14 CFR Section:</b>	<b>can be used to comply with the specific policy or guidance listed below:</b>
Seat Back Handhold	3.1.2	Not applicable	Not applicable	Not applicable	Not applicable	
Seatbelt Misalignment	3.2.2, 3.2.3	4.1.3	3.1.11, 3.2.3 for restraint system	3.1.11, 3.2.3 for restraint system	25.601	
Life Vest Retrieval	3.3.2	Not applicable	3.1.8	3.1.20	25.1411, 25.1541	
Friction Fit Components	3.4.2	Not applicable	Not applicable	Not applicable	Not applicable	
Hinged Aisle Armrests – Discreet Latch *	3.6.2	Not applicable	Not applicable	3.2.14	25.789, 25.815	AC 25-17A (pending)

# Aerospace Recommended Practice (ARP) 5526



Topic	The guidance in ARP5526, paragraph:	can be used to comply with TSO-C39b	can be used to comply with TSO-C127, AS8049, paragraph:	can be used to comply with TSO-127a	can be used to comply with Title 14 CFR Section:	can be used to comply with the specific policy or guidance listed below:
Baggage Bar Loading	3.7.2	Not applicable	3.2.7, 5.1.7	3.2.7, 5.1.7	25.787	AC 25-17 Para. 102(b)(2)
Seat Safety Placards	3.8.2	Not applicable	Not applicable	3.1.20 a, 3.2.7	25.811 (f)(2), 25.1411(b)(1), 25.1541	AC 25-17 Para. 1041(b)(1)
Literature Pocket Stowage Capacity	3.9.2	Not applicable	5.1.7, 5.1.9, 5.3.5.1	5.1.7, 5.1.9, 5.3.5.1	25.601, 25.787(a), 25.789(a)	
Tray Table Latch Retention	3.10.2	Not applicable	Not applicable	Not applicable	25.813	
Finger Pinch	3.11.2	Not applicable	Not applicable	3.1.17	25.601, 25.785	
Sharp Edges	3.12.2	Not applicable	3.1.15	3.1.15	25.601, 25.785	

# Aerospace Recommended Practice (ARP) 5526



Topic	The guidance in ARP5526, paragraph:	can be used to comply with TSO-C39b	can be used to comply with TSO-C127, AS8049, paragraph:	can be used to comply with TSO-127a	can be used to comply with Title 14 CFR Section:	can be used to comply with the specific policy or guidance listed below:
Delethalization of Seat Features *	3.13.2	4.1.4	3.1.15, 3.2.1, 3.2.2	3.1.15, 3.1.18, 3.1.19, 3.2.1, 3.2.2	25.601, 25.785	Letter TAD-96-002 Appendix A  Policy memo in process
Seat Features Adjusted With/Without Tools	3.14.2	Not applicable	3.2.3	3.2.3	25.561, 25.789, 25.813	
Legrest and Footbar Retention	3.15.2	Not applicable	3.2.6	3.2.6	25.789, 25.813	
Emergency Escape Path (Proximity) Lighting	3.16.2	Not applicable	Not applicable	Not applicable	Not applicable	
Rotating Armrests	3.17.2	Not applicable	Not applicable	Not applicable	25.785	AC 25-17  (14 CFR PART 25.785) guidance (5) Para. (c)(2)

# Aerospace Recommended Practice (ARP) 5526

---



## Summary:

- Intent of policy: reduce regulatory burden
- Seat manufacturer statement to be provided to applicant for type design change
- ARP 5526 does not address all part 25 requirements which may be applicable to the system

# Aerospace Recommended Practice (ARP) 5526

---



## Conclusion:

- When a statement is provided by the seat manufacturer, that the seat has met the pass fail criteria in ARP 5526, it is not necessary for the FAA engineer *or* designee to further review the installation with respect to the issues covered under the scope of ARP 5526.



---

**FAA DER Seminar**

**AAIR ENGINEERING UPDATE**



---

# Globalization Issues

George Panger  
Seattle ACO, ANM-150S

# Globalization Issues

---



## SACO/Applicant PSP Initiatives:

- Many Certification Projects Involve Multiple ACOs and Bilateral Partner Aviation Authorities
- Many Certification Projects Do Not Make Effective Use of These Local Authorities
- Policy and Guidance Exists Which Can Eliminate Current Duplication of Efforts

# Globalization Issues

---



## Utilizing Technical Standard Order Authorizations (TSOA):

- 14 CFR Part 21, Subpart O
  - Prescribes Minimum Performance and Quality Control Standards for Specified Materials, Parts, Processes, or Appliances used on Civil Aircraft
- Order 8150.1B - TSO Program
- Advisory Circular 20-110L - Index of Aviation Technical Standard Orders

# Globalization Issues

---



## Utilizing TSOA (cont'd):

- An Applicant for a TC, ATC, or STC
  - Must Submit Data Showing that the Product Being Certificated Meets the Applicable Requirements of 14 CFR, Part 25
  - TSO Data May Be Used to Show Compliance and is Already FAA Approved
  - Needs to Obtain FAA Approval of Any Additional Data Not Covered by the TSO MPS

# Globalization Issues

---



## STC Modifications Incorporated by a PC Holder of a TC:

- 14 CFR Part 21, Subpart G
  - Prescribes Procedural Requirements and Rules for Production Certificate Holders
- Order 8120.2C – Production Approval & Certificate Mgmt
  - Amend Aircraft Type Design to Incorporate the STC Design
  - Incorporation of the STC Design Without Amending the Aircraft Type Design
  - Post Production Installation of the STC by an FAA Certified Repair Station

# Globalization Issues

---



## STC Modifications Incorporated by a PC Holder of a TC (cont'd):

- Incorporation Without Amending
  - PC Holder Adds STC to PLR
  - QC Data is Revised as Necessary
  - STC Data Provides Details Necessary for Manufacture and Conformity
- STC Holder and PC Holder Must Coordinate to Ensure Product Meets Applicable Requirements

# Globalization Issues

---



## Use of Another Company's DER:

- Order 8110.37C – DER Guidance Handbook
  - A Company DER May Only Approve Technical Data for the Company
- Business Arrangement
  - May Allow One Company to Use Another Company's DER
  - Company Must Request in Writing to Expand the Existing Delegation

# Globalization Issues

---



## Use of Another Company's DER (cont'd):

- ACO Must Have Need and Ability to Manage the Expanded Delegation
  - Must be Established Company DER in Good Standing Capable of Making Determinations of Compliance for Company's Product
  - Use of Another Company's DER Will Eliminate Duplication of Evaluation of Data

# Globalization Issues

---



## Use of Previously Approved Data:

- Order 8110.4B – Type Certification
  - Prescribes the Use of Data Previously Approved by the FAA for the Purpose of Showing Compliance to 14 CFR Part 25
- Applicant Must -
  - Provide Evidence of Approval to FAA (Approval=Validity)
  - Establish Applicability of Previous Data
  - Provide Sufficient Data such that Compliance can be Found and Continued Airworthiness is Acceptable

# Globalization Issues

---



## Use of Previously Approved Data (cont'd):

- FAA Memorandum – Guidance on Use of Previously Approved Compliance Data from Foreign Sources (soon to be an FAA Order)
- Applicant Must -
  - Provide Evidence of Approval to FAA (Approval + Bilateral = Validity)
  - Establish Applicability of Previous Data
  - Provide Sufficient Data such that Compliance can be Found and Continued Airworthiness is Acceptable

# Globalization Issues

---



## Bilateral Aviation Safety Agreements:

- Implementation Procedures
  - Allow for Technical Assistance Between Authorities on Current Programs
    - Witnessing Tests
    - Reviewing Reports
    - Performing Conformity and Compliance Inspections
  - Authority-to-Authority Communication

# Globalization Issues

---



## Partnership for Safety Plans (PSP):

- FAA and Industry Guide to Product Certification
  - Certification Process Improvement Principles
    - Development of a PSP Between an ACO and an Applicant Enables Both Parties to Conduct Certification Activities More Effectively while Focusing on Safety Significant Issues.
    - An Applicant with a PSP is able to Document Agreements with their Local ACO, such as Development of Streamlined Processes or Delegation of Special Authorizations
    - These Documented Agreements Allow for Efficient Generation of FAA –Approved Data Which will be Recognized by Other ACOs



---

United Kingdom Civil Aviation Authority  
Airworthiness Notice No. 64  
Minimum Space for Seated Passengers

Shannon Lennon  
Seattle ACO, ANM-150S

# UKCAA AN No. 64

---



- Mandatory compliance for all UK registered transport aircraft over 5700 kg MTWA and configured to carry 20 or more passengers
- Requirements developed solely to support successful evacuation of an aircraft in the event of an emergency

# UKCAA AN No. 64

---

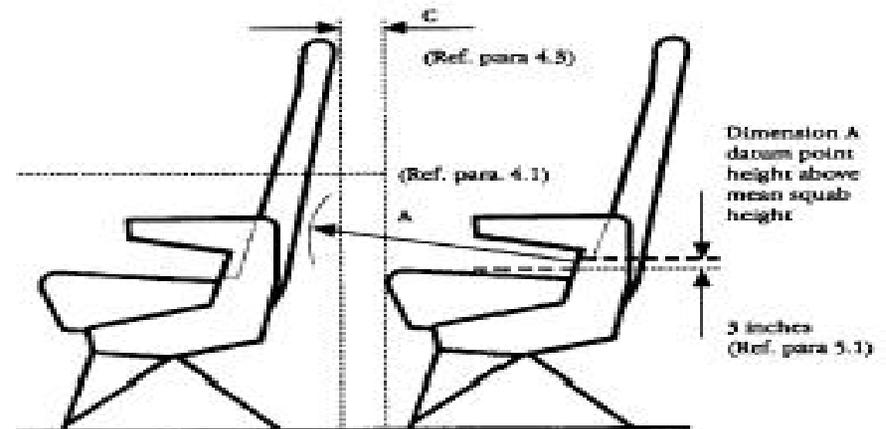


- General overview of requirements
- Clarification guidelines
  - Based on request of UKCAA and other applicants

# UKCAA AN No. 64



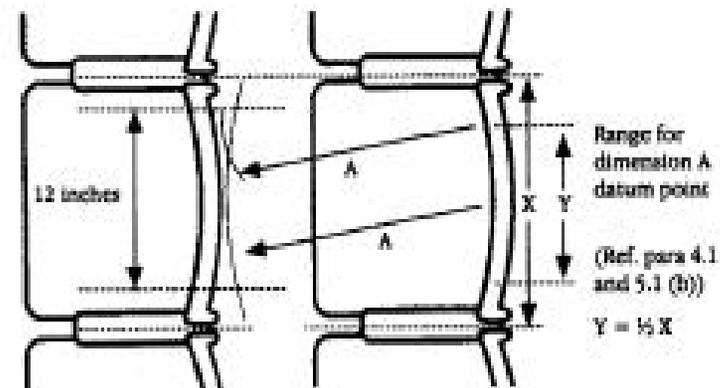
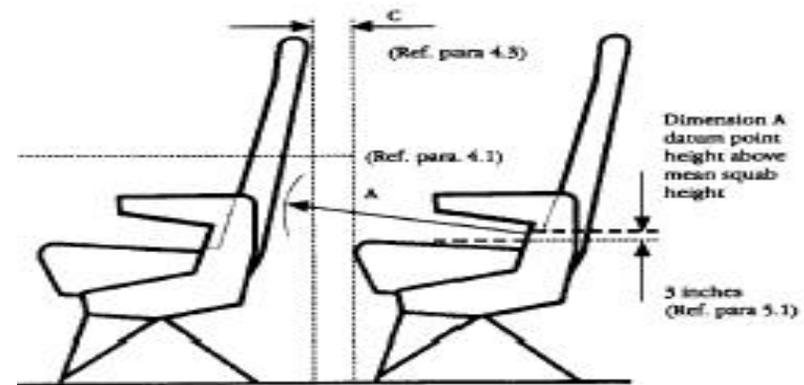
- The minimum distance between the back support cushion of a seat and the back of the seat or other fixed structure in front, shall be 26 inches. (Dimension A)



# UKCAA AN No. 64



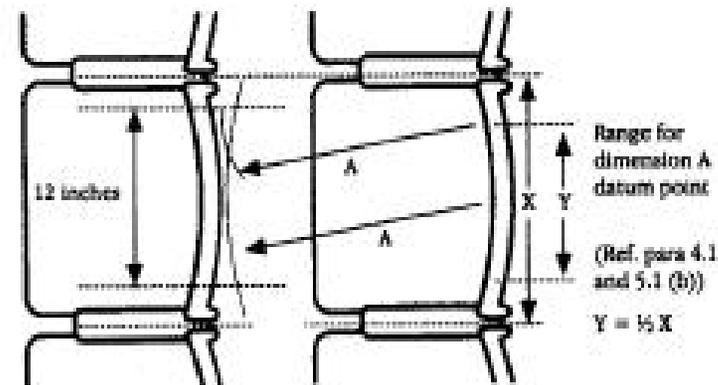
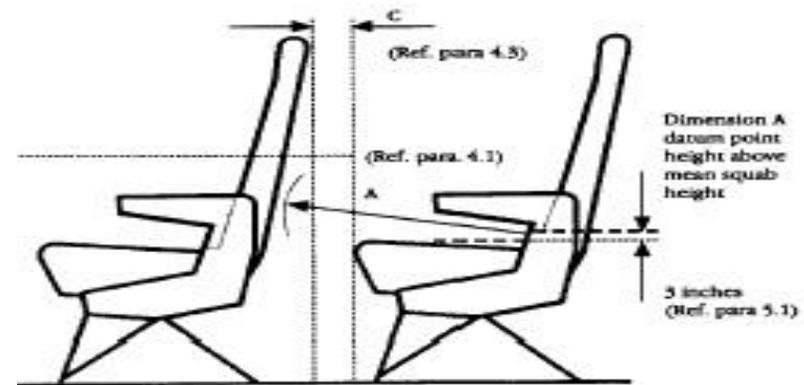
- Dimension A measurements shall be taken from the center of the seat back at a height of 3 inches above the mean uncompressed seat bottom cushion height to the seat or other fixed structure in front made in both vertical and horizontal arcs up to a limiting height of 25 inches above the carpeted floor level, over the full seat place width 'X'.



# UKCAA AN No. 64



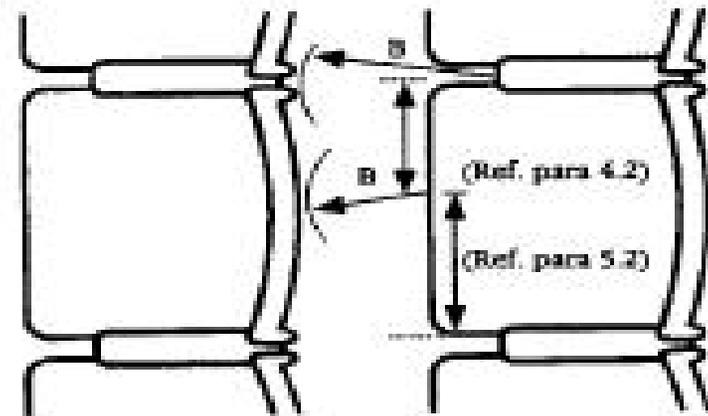
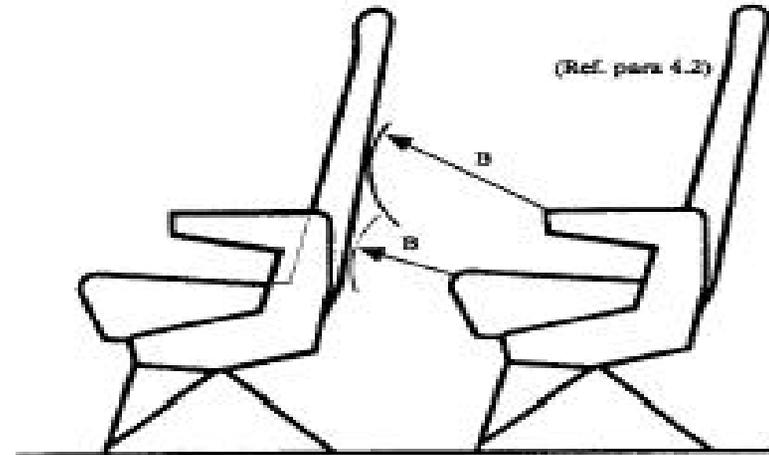
- Dimension A measurements shall be taken from any point on the seat back within the center one half 'Y' of the seat place width at a height of 3 inches above the mean uncompressed seat bottom cushion height to the seat or other fixed structure within the central 12 inch region in front made in vertical and horizontal arcs up to a limiting height of 25 inches above the carpeted floor level.



# UKCAA AN No. 64



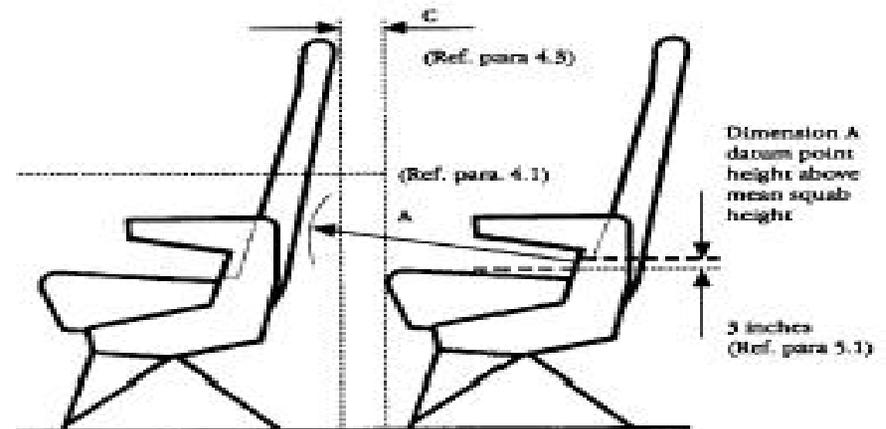
- The minimum distance between a seat and the seat or other fixed structure in front, shall be 7 inches.  
(Dimension B)
- Measurements shall be made from the forward edges of the seat bottom cushion and the seat arm rests in both horizontal and vertical unlimited arcs.



# UKCAA AN No. 64



- The minimum vertically projected distance between seat rows or between a seat and any fixed structure forward of the seat, shall be 3 inches. (Dimension C)



# UKCAA AN No. 64

---



- Clarifications:
  - Measurements shall be made with seats in normal upright position.
  - In terms of deformable soft furnishings, it is acceptable to compress fabric as long as no seat foam or structure is compressed during the assessment.

# UKCAA AN No. 64

---



- Clarifications, continued:
  - Tray tables shall be placed in stowed position during measurements.
  - Seat spacing shall be assessed with normal literature pocket contents installed. Normal is defined as operator intended contents. (i.e. safety card, air sick bag, and operator provided in-flight reading material)

# UKCAA AN No. 64

---



- Additional information regarding the development of these requirements can be found at:

[www.caa.co.uk/srg/default.asp](http://www.caa.co.uk/srg/default.asp)



---

# Material Variability Considerations for Substantiation of Interior Structures

Don Wren  
Seattle ACO, ANM-150S

# Title 14 CFR 25.613 – Material Strength Properties and Design Values

---



- Material strength properties must be based on enough tests of material meeting approved specification to establish design values on a statistical basis
- Design values must be chosen to minimize the probability of structural failure due to material variability.

# Title 14 CFR 25.613 – Material Strength Properties and Design Values

---



- Applies to substantiation of interior structure fabricated from non-traditional materials or using non traditional fabrication techniques.
- Compliance via full scale structural testing may not include the submission of any other supporting strength data, including strength analysis and/or material properties.

# Title 14 CFR 25.613 – Material Strength Properties and Design Values

---



- Means of Substantiation:
  - Analysis using statistically derived material design values with the analytical reliability validated by structural testing
  - Full scale testing providing that the applicant can demonstrate testing will ensure a reliably repeatable strength level for the articles subsequently manufactured

# Title 14 CFR 25.613 – Material Strength Properties and Design Values

---



- Means of Substantiation:
  - Applicant may be able to utilize an overload factor in conjunction with static testing to account for material variability.
  - Determination of the overload factor should be based on an understanding of the product's material characteristics and fabrication processes relative to established materials and associated processes (i.e. comparison to conventionally fabricated aluminum structure)

# Title 14 CFR 25.613 – Material Strength Properties and Design Values

---



- Please contact the appropriate ACO engineer for concurrence of proposed methods of compliance.



---

# Seattle Aircraft Certification Office Management DER

---

David Crotty  
Seattle ACO, ANM-150S

# Presentation Objectives

---



- Clarify Management DER Roles & Responsibilities as defined by FAA Orders
- Clarify Seattle Aircraft Certification Office (ACO) expectations for Management DER project oversight/assistance

# Regulatory Basis for Delegation

---



- Title 49 US Code is the legislative instrument which governs US aviation
- Section 44702 (d) of Title 49 provides the Administrator the power to delegate qualified persons to perform certain functions for the Administrator
- Order 8100.8B, Designee Management Handbook, establishes policy and procedures for the selection, appointment, orientation, training, oversight, renewal, tracking, and termination of certain representatives of the FAA, including Management DERs.
- Order 8110.4B, Type Certification Process, prescribes the responsibilities and procedures for FAA personnel responsible for aircraft certification. Also applies to designees.
- Order 8110.37C, DER Guidance Handbook, provides guidance and procedures for administering designee program.

# Roles & Responsibilities

---



- FAA Order 8100.8B, Paragraph 309 states:
  - “Management . . . delegations relieve the FAA from having to do the normal project administration, technical coordination, and guidance usually associated with a certification program.”
  - “The Management DER, usually a consultant DER, performs FAA certification project management duties for the FAA. In this capacity, the DER performs duties similar to the FAA program manager. These duties include organizing the certification program, and directing, overseeing, and managing the tasks of technical assessments and finding of compliance. The DER ensures that all technical data required is reviewed and approved by the appropriate DER for compliance, except in those areas reserved for FAA approval.”

# Roles & Responsibilities

---



- Order 8110.37C, Paragraph 504 further defines the Management DER functions for the following areas:
  - Project Management
  - Certification Plan
  - Special Conditions, Exemptions, Equivalent Safety
  - FAA Form 8110-3
  - Coordination

# FAA Expectations

---



- Coordinate with FAA Advisor and FAA project manager to understand specific responsibilities required by the FAA.
- Perform FAA certification project management duties for the ACO similar to the FAA project manager. This includes:
  - Organizing the program
  - Directing, overseeing and managing the task of technical assessments and findings of compliance
  - Ensuring that all technical data is reviewed and approved by the appropriate DER, except in those areas reserved for FAA approval.
- Perform his/her functions in a professional manner.

# FAA Expectations

---



- Review the certification plan to ensure that:
  - The project/system description is in sufficient detail to allow FAA review/approval
  - The Certification Basis (applicable regulations, amendment levels, ADs, Special Conditions, Exemptions, ESF, etc.) is complete
  - The means of compliance/substantiation/documentations is defined for all requirements, including proposed testing
  - All requests for DER, DAR, DMIR delegation are proposed
  - The program schedule is correct
  - The location and aircraft registration of the prototype installation is identified
- Ensure proposed DER delegations are within authorization and experience levels; appointment letters must be reviewed
- Be available to answer questions, coordinate cert plan review, and attend kickoff meeting with FAA

# FAA Expectations

---



- Review 100% of the drawings to ensure the dates and revision levels are as listed on the Master Drawing List. In addition the DER should be checking for anything that is obviously wrong (i.e., flagnote on picture sheet that isn't defined in the flagnote section.)
- Ensure that 100% of the substantiation documentation has been reviewed for proper document control (all pages are properly identified, revision levels of the pages are correct etc.). Check for anything that is obviously wrong (all flam tests “passed”, positive margins in structural substantiation, electrical loads do not exceed generator capability, etc.).
- Verify that appropriate test article and test set-up conformity has been accomplished for all certification testing

# FAA Expectations

---



- The FAA expects that the Management DER will keep the ACO apprised of all changes to the approved certification plan. All changes must be FAA approved.
- Verify that regulations and documents/deliverables listed in the accepted certification plan are approved via FAA Form 8110-3s or by the FAA. Any deviations to the certification plan must be justified and coordinated in timely manner with the FAA by the cognizant technical DER and recorded in a revised certification plan or certification summary document, as agreed to by the FAA project manager.

# FAA Expectations

---



- Prepare Requests for Conformity and Type Inspection Authorizations and submit to the Aircraft Certification Office or, if authorized, submit directly to the Manufacturing Inspection District Office.
- Ensure that all conformity paperwork is in order: appropriate FAA Form 8130-9 authorization letters have been generated and conformity inspections have been accomplished in accordance with the pertinent Form 8120-10s. Review FAA Form 8100-1s for accuracy compared to the design data listed on the Form 8120-10s. Verify that all conformity Unsats have been dispositioned and recorded appropriately.

# FAA Expectations

---



- Verify that flight testing has been accomplished in accordance with the approved type inspection authorization
- Prepare and maintain a status sheet throughout the program. This list should identify all deliverables and major milestones. Provide a periodic status to the FAA in a manner agreed to with the project engineer
- All submittals to the FAA must be accompanied by a cover letter signed by the management DER. Currently, some letters of authorization, Partnership for Safety Plans, and some FAA Advisors also require FAA Forms 8110-3 from management DERs. Please be aware that the FAA is moving away from this requirement and will provide revised guidance in the future. You may continue operating per your current guidance or coordinate with your FAA Advisor and project managers.
- An FAA Form 8110-3 from the Mgmt DER is no longer required for the Certification Plan

# FAA Expectations

---



- At the end of the project, ensure the it has been accomplished in accordance with the FAA accepted certification plan. Ensure that compliance has been demonstrated and documented for the entire certification basis (FARs, JARs, exemptions, ESFs, special conditions, etc.) and that all documents/deliverables listed in the accepted certification plan, have been submitted to the FAA and are approved.
- Prepare a certification summary document

# FAA Expectations

---



- Bring the final package to the FAA in an organized manner (i.e., documents in notebooks and the drawings in a box filed in a numerical order).
- A Management DER may utilize the assistance of an Administrative DER as agreed to in the company Partnership for Safety Plan and/or Project Specific Certification Plan.

# Summary

---



- Regulatory Basis for Delegation
- Defined Roles & Responsibilities
- Specific FAA Expectations



---

# Questions & Answers

David Crotty  
Seattle ACO, ANM-150S

# Questions #1

---



- Q: Which DER discipline (Seat Dynamic Test or Interior Arrangements) is responsible for finding compliance to FAR 25.562(a)? If both are responsible, which aspects of the paragraph should each discipline address?
- A: FAA letter 120S-01-212, dated March 12, 2001 provides guidance. The Seattle ACO has the expectation that the delineation of responsibility between these two DER disciplines is as follows:
- Section 25.562(a) - The Interior Arrangement DER's are responsible for finding compliance with this requirement. It is the expectation of the SACO that the Interior Arrangement DER's will accomplish this by reviewing the seat installations during the Interior Compliance inspection. This will require that the Interior Arrangement DER's verify that each occupant has enough room to properly sit in their seat and can access and make use of the seat belts that are provided.

# Question #1 cont'

---



Sections 25.562(b) and (c) - The § 25.562 DER's are responsible for all compliance findings related to these requirements, except as noted below.

Sections 25.562(c)(5), (c)(6), (c)(8) - These requirements pertain to head injury criterion, femur loads and deformation limitations, and the compliance responsibility is to be shared between the § 25.562 DER's and the Interior Arrangement DER's. It is the expectation of the SACO that the § 25.562 DER's will witness the testing, and oversee collection of all of the test data necessary to make a compliance finding; the Interior Arrangement DER's will use this data to find compliance for the installation dependent aspects of the seating configuration installed on the airplane. This typically includes verifying front row setbacks, seat pitches, checking deformations into aisles, assist spaces, projected exit openings, passageways, etc. The Interior Arrangement DER's must also assess any egress concerns resulting from seat components that may have deployed during dynamic testing.

# Question #2

---



Q: What requirements for deflections must be considered for installation configurations where 16g seats may contact 16g seats, especially with regard to seat-to-seat dynamic load sharing and HIC? Also, what requirements must be considered for installation configurations where 16g seat-to-9g monument contact may occur, especially with regard to HIC?

A: All 25.561 and 25.562 requirements must still be met.

- Ensure that the head path clears or run HIC tests.
- Seat-to-seat load sharing need not be considered structurally as long as design includes appropriate clearance.

# Question #3

---



Q: FAA Memorandum “Standard Content and Format for the Installation Instructions and Limitations Required by TSO-C127a,” dated September 8, 2003, states “A TSO article installed in accordance with an IIL as described in this memorandum should be subjected only to a determination that the article complies with the IIL. It is not necessary to investigate the data supporting the information approved in the IIL under the TSO approval.” The DERs’ understanding of this statement is that if the data required to approve an installation are included in the IIL, then further review of the data in the dynamic test report is not required to approve the installation. Is this understanding correct?

A: This is correct. For the requirements of the TSO that are coextensive with the Part 25 requirements no further review beyond the IIL is necessary to make the Part 25 finding of compliance.

# Question #4

---



Q: What paperwork defines that “B” allowables are appropriate for Interiors Structures?

A: There is nothing that explicitly states that B allowables are appropriate for interior structures.

Per 25.613(b), design values must be chosen to minimize the probability of structural failures due to material variability. Compliance must be shown by selecting design values which assure material strength with the following probability:”

- (1) Where applied loads are eventually distributed through a single member within an assembly, 99% probability with 95% confidence.
- (2) For redundant structure. . .90% probability with 95% confidence.

# Question #5

---



Q: What FARs should be listed on the 8110-3 for the monument abuse load test plan and report? Please clarify

A: There is no general FAA requirement or policy for monument abuse load testing.

# Question #6

---



**Q:** What are the criteria for dynamic testing for the interior monuments, and when it is applicable? I believe that this is required when the attendant seat is attached to the monument. Please clarify.

**A:** Monument testing is only performed if the monument is determined to be part of a seat support (e.g. partition-like monument) or where the design was not envisioned during the promulgation of the rule (e.g. overhead crew rests). In this case only static load coupon testing is required. The monuments are not subjected to dynamic testing.



---

# Questions & Answers

Keith Ladderud  
Seattle ACO, ANM-150S

# Question #7

---



Q: Should a test witness expect to see a completed 8100-1 before starting a test?

A: Yes.

FAA Order 8110.4B, Paragraph 2-11, “An FAA conformity inspection should be successfully conducted before any official FAA tests (ground or flight) are conducted.”

# Question #8



---

Q: If the test plan states that certain parts will not be installed (i.e. electrical wiring, plumbing, etc) and they are still on the drawing, does the inspector need to call these as unsat on the 8100-1?

- A: The inspector is required to execute the conformity as defined on the 8120-10, Request for Conformity.
- If the RFC conforms per the test plan which lists the missing parts then there are no unsats. It is important to specify the proper engineering data.
  - If the RFC only conforms per installation design data but there are missing parts then these missing parts must also be listed on the 8130-9 under Deviations. Those deviations are to be coordinated with the FAA Project manager and must be dispositioned on the 8100-1, Conformity Inspection Record.

# Question #9

---



**Q:** Refurbishing a test article for production. How should this be handled? Some DERs specify on the test report 8110-3 that the approval excludes responsibility for refurbishing. What if supplier does not address refurbishing in the test plan? Are the DERs still responsible?

**A:** Refurbishing a test article for production is not part of the type design approval process, therefore, it is not the responsibility of any DER. If it is included in a test plan or report, then an exclusion note on the 8110-3 is acceptable.

# Question #10

---



Q: Disposition of UNSATS on the 8100-1: What is the preferred method to record the disposition? Some DERs write it on a copy of the 8100-1 and fax this back to the test site. Others prefer that the disposition be recorded in the test plan. Some prefer a rejection tag. What does the FAA suggest?

A: Per FAA Order 8110.4B: “Any nonconformities found as a result of the conformity inspection require ACO project engineer or authorized DER disposition on FAA Form 8100-1.”

# Question #11

---



Q: Per FAA letter [ref 120S-02-1009] the phrase “or latest revision” may be used on the 8120-10 Request for Conformity form. This adds more time to the DER’s review of conformity paperwork at the time of the test, and places unrealistic expectations on the DER. Would the FAA please comment?

A: MIDO Policy:

Accept FAA Form 8120-10, issued by the ACOs with a specific cited drawing revision **with or without** “or later FAA approved revision.”

Perform the conformity and if there is a difference in revision than the one specified, call the FAA Project Manager (PM)/DER listed on the RFC to confirm that the revision presented is consistent with the submitted engineering data that the PM/DER holds.

On the FAA Form 8100-1 comments section add a note that the revision was coordinated with the FAA PM/DER, contact was made and acknowledged with the specified FAA revision for the conformity.

# Question #11 cont'

---



Mark the item "satisfactory" (if it meets the design data to the coordinated revision) based on the coordination with the FAA PM/DER.

At times, the FAA Form 8120-10 lists a DER who has the disposition authority, this authority can provide an approval of the revision level as an alternate to the PM/project DER.

If the PM/DER cannot be contacted, perform and complete the conformity presented by the applicant and mark the item "unsatisfactory" to be cleared by the PM/DER at a later date. On the FAA form 8100-1 comment section, note that the PM/DER could not be contacted. Follow-up calls to the PM/DER should be made by the ACO coordinator or assigned PI of the designee.

Complete and submit the final conformity package per FAA Order 8110.4

# Question #12

---



- Q: FAR 25.605 states that the method of fabrication must produce a consistently sound structure and must be performed under an approved process specification. Furthermore FAA Order 8110.4B reads, the applicant should be encouraged to submit their process specification for approval early in the program. They should be reminded that a TC or STC cannot be issued until all processes are reviewed. It is my understanding that all processes must be approved. Approving type design does not imply approval of the processes called out. If the process is not approved, then separate approval is required.
- A: Process specifications are typically approved by the DERs/FAA as part of the Type Design descriptive data when listed on the drawings. The same is true if they are called out in substantiation documents (analyses, test plans, test reports). They must be part of the drawing or documentation tree and not just “referenced.” They are not approved individually.

# Question #13

---



Q: What is the criteria for using double latch for the monuments?  
Only to the forward facing doors that contains items of mass?

It is my understanding that double latch mechanism is the mechanism that has one redundant latching capability. Please clarify

A: Paragraph 121.311(f) requires compliance with Paragraph 25.785 at amendment 25-51. Advisory Circular 25.785-1A, Paragraph 7(b) specifies that if a flight attendant seat is located **three rows fore or aft** from center of a galley or stowage compartment then dual latching or equivalent is required to retain all items of mass in galley or stowage compartment.



---

# Interior Certification

## FAA/Boeing PSP

Shannon Lennon

Seattle ACO, ANM-150S

# Interior Certification

---



- Significant progress has been made on a number of issues which supports the objective of enabling a more efficient and timely interior certification process.
- Accomplishments to date are in the area of policy reviews and guidance documentation.

# Interior Certification

---



- Progress to date:
  - Inspection of Follow-on Airplanes Guidelines (FAA letter 120S-02-212, dated 3/21/02)
  - Compliance Inspection and Conformity Guidelines (FAA Letter 120S-02-736, dated 8/30/02 and FAA letter 120S-02-1009, dated 11/13/02)
  - Certification action item documented for Compliance to § 25.1301 for Emergency Equipment (FAA Letter 120S-02-1110, dated 11/26/02)

# Interior Certification

---



- Progress to date, continued:
  - Means of Compliance Issue Paper for Retention of Items of Mass Under § 25.562, dated 12/20/02
  - Equivalent Safety Finding Issue Paper for Offset Cross Aisle at Type III Exits, dated 1/14/03
  - Revised Interior Compliance Inspection Guidelines (FAA letter 120S-03-311, dated 4/21/03)
  - Guidelines for Compliance with Dual Latching Requirements of § § 25.785(j) and 25.787(b), Amendment 25-51 (FAA letter 120S-03-411, dated 5/8/03)

# Interior Certification

---



- Other items in work:
  - Galley alternate conversion kit certification
    - Proposal accepted via FAA letter 120S-03-632, dated 6/18/03
    - Desktop instruction to document process is in work
  - Installation of monument-mounted delethalization padding
    - FAA is currently working to validate proposal through representative testing
    - Interim response provided via FAA letter 120S-03-608, dated 7/10/03

# Interior Certification

---



- Other items in work, continued:
  - Incremental certification
    - Promotes earlier certification of installations and components
    - Tip sheets documenting each process in work
      - Certification by analysis
      - Compliance inspection at supplier facility
  - Generic galley electrical insert certification
    - Qualification of electrical components outside of dedicated projects via a technical services agreement between supplier and Boeing

# Interior Certification

---



- More information to come.....
  - Expecting more policy review proposals to be submitted, for example:
    - Dual latching of emergency equipment
    - Joggled aisle requirements
    - Use of graphical exit signs
  - Ongoing effort: target rate is one subject review per month through the end of 2004

# Questions?

---

