Aircraft Certification
Designee Management

Engineering Designee Recurrent Seminar

General Session

August 17, 2016
Seattle WA

Delegation and Organization Procedures Branch AIR-160

General Session Presentation Printout

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Renewal Requirements

FAA22000002 DER Recurrent General Session

FAA Order 8100.8D paragraph 803.g. states: "DERs must attend a recurrent seminar every 2 calendar years to maintain their knowledge of the regulations and policies and as a condition for renewal. DERs may satisfy the 2 year requirement by attending a DER seminar in the calendar year it is due.

Contact EDR Training

If you have any questions or comments concerning the content of this document, send an email to the Engineering Designee Recurrent Training Branch.

For Program Information visit our website:
Engineering Designee Recurrent Training Information

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3. Update to Designee Management System (DMS) schedule
4. Repairs and Repair Specifications
5. Additive Manufacturing
6. Updates to the DER Handbook (8110.37)
7. § 23 Rewrite

Level of FAA Project Involvement — Kevin Kendall (AIR-160)

AM Checklist

2016 Engineering Designee Recurrent Seminar
General Session

8:00 – 8:15	.....Intro/Logistics/Announcements	Tony Jopling (AIR-160)
8:15 – 8:30	.....Welcome	TBD / Kevin Kendall (AIR-160)
8:30 – 9:00	.....Engineering Designee Training Overview	Tony Jopling (AIR-160)
9:00 – 9:30	.....Stump the Regulator	All AIR-160
9:30 – 10:00	.....Break	
10:00 – 12:00	.....What's New?	Jon Mowery (AIR-160)
12:00 – 1:30	Lunch	
1:30 – 2:30	.....Level of FAA Project Involvement	Kevin Kendall (AIR-160)
2:30 – 3:00	General Questions / Learning Assessment	

Acronym/Symbol	Definition
§	Section
14 CFR	Title 14 of the Code of Federal Regulations
AC	Advisory Circular
ACE	Small Airplane Directorate (SAD)
ACO	Aircraft Certification Office
AD	Airworthiness Directive
ADO	Approved Design Organization
AEG	Aircraft Evaluation Group
AIA	Aerospace Industries Association
AIR	Aircraft Certification Service
AIR-1	Director, Aircraft Certification Service
AIR-100	Design, Manufacturing & Airworthiness Division
AIR-110	Certification Procedures Branch
AIR-120	Technical & Administrative Support Staff Branch
AIR-130	Systems & Equipment Standards Branch
AIR-140	Operational Oversight Policy Branch
AIR-150	System Performance and Development Branch
AIR-160	Delegation and Organization Procedures Branch
ASTC	Amended Supplemental Type Certificate
ASW	Rotorcraft Directorate
ATC	Amended Type Certificate
ASTM	American Society for Testing and Materials
AVS	Aviation Safety
C of A	Certificate of Airworthiness
CA	Certificating Authority (a.k.a. exporting authority)
CBT	Computer Based Training
CDO	Certified Design Organization
CDPO	Certified Design Production Organization
CFR	Code of Federal Regulations
CLOA	Certificate Letter of Authorization
CMACO	Certificate Management ACO
COA	Certificate of Authority
COS	Continued Operational Safety
CP	Certification Plan
CPN	Certification Project Notification
DAH	Design Approval Holder
DAR	Designated Airworthiness Representative
DBR	Delegation by Regulation
DER	Designated Engineering Representative
DIN	Designee Information Network
DMS	Designee Management System
DOT	Department of Transportation
DRS	Designee Registration System

E&PD	Engine and Propeller Directorate
ECO	Engine Certification Office
EDR	Engineering Designee Recurrent
EMI	Electro-Magnetic Interference
F	Fahrenheit
F&R	Function and Reliability
F/A	Flight Attendant
FAA	Federal Aviation Administration
FAATC	Federal Aviation Administration Technical Center
FADEC	Full Authority Digital Engine Control
FANS	Future Aeronautical Navigation System
FAQ	Frequently Asked Questions
FAR	Federal Aviation Regulation
FCAA	Foreign Certification Airworthiness Authority
FSDO	Flight Standards District Office
GA	General Aviation
GAMA	General Aviation Manufacturers Association
GAO	General Accounting Office
HQ	Headquarters
ICA	Instructions for Continued Airworthiness
LOPI	Level of Project Involvement
MARPA	Modification and Replacement Parts Association
MOC	Method of Compliance
MOU	Memorandum of Understanding
NACIP	National Automated Conformity Inspection Process
NAS	National Airspace System
NPRM	Notice of Proposed Rulemaking
NTSB	National Transportation Safety Board
ODA	Organization Designation Authorization
ODAR	Organizational Designated Airworthiness Representative
OIG	Office of the Inspector General
OMT	Organization Management Team
PACO	Project Aircraft Certification Office
PMA	Parts Manufacturer Approval
PNL	Program Notification Letter
POA	Production Organization Approval
POC	Point of Contact
PSCP	Project Specific Certification Plan
PSP	Partnership for Safety Plan

PTRS	Program Tracking and Reporting Subsystem
R&A	Repairs and Alterations
RBDM	Risk Based Decision Making
RBRT	Risk Based Resource Targeting
RFC	Request for Conformity
RGL	Regulatory and Guidance Library
SAD	Small Airplane Directorate
SAIB	Special Airworthiness Information Bulletin
SAR	Selection, Appointment, and Renewal
SFAR	Special Federal Aviation Regulation
SME	Subject Matter Experts
SMS	Safety Management System
SOP	Standard Operating Procedure
SRM	Safety Risk Management
STC	Supplemental Type Certificate
TAD	Transport Airplane Directorate
TBD	To Be Determined
TC	Type Certificate
TCDS	Type Certificate Data sheet
TSO	Technical Standard Order
TSOA	Technical Standard Order Authorization
UM	Unit Member

Engineering Designee Training Overview

Presented to: 2016 Engineering Designee Recurrent Seminar

Federal Aviation Administration

Seminar Program Overview

- **Online Website & Updates**
- **Course Fees**
- **Recurrent General Session**
- **Renewal Requirements**
- **Seminar Locations**
- **Recurrent Technical Sessions**
- **New Courses**
- **Course Certificate and Instructions**
- **Future Improvements**
- **Feedback**
- **Contact Us**

Designee Training Program Website

- http://www.faa.gov/other_visit/aviation_industry/designees_delegations/training/DER_Recurrent/

- **Best Place for Most Up to Date Information**
  - ***General Session Schedule***
  - ***ODA Training Information***
  - ***Technical Session Updates***
  - ***Deviation Memos***
  - ***etc.***

Course Fees

- **Necessary to begin to return course fees to normal level**
- **This means all courses will see some sort of increase in tuition**
- **Some new courses will see the fee structure change**
- **Changes will occur over the next calendar year**

Recurrent Seminar General Session

- **Focus on material applicable to all (or most) attendees such as:**
  - *Changes in Designee Management*
  - *Changes in TC/STC Process*
  - *Changes in TSO/PMA*
- **½ to 1 day in-person (face to face)**
- **Same Locations as Previous Years**
  - *Every Year: Atlanta, Seattle, Los Angeles, Ft. Worth, Wichita*
  - *Every 2 Years (Alternating): New York, Denver, Chicago, Boston, Anchorage*
- **Renewal Requirements**

Renewal Requirements

- **The requirements for DER Recurrent training are contained in Para 803 (g) of FAA Order 8100.8D. The online training has NOT changed that requirement. For example, if you last completed recurrent training anytime in 2014 then you must complete recurrent training during 2016, i.e. before January 1, 2017.**

- **FAA Order 8100.8D paragraph 803.g. states: "DERs must attend a recurrent seminar every 2 calendar years to maintain their knowledge of the regulations and policies and as a condition for renewal. DERs may satisfy the 2 year requirement by attending a DER seminar in the calendar year it is due."**

Seminar Locations

DER & ODA Location Rotation (Tentative Schedule) Last Updated: 3/9/2016				
Month	2015	2016	2017	2018
March	~~Wichita~~	Wichita	Wichita	Wichita
April	Wichita Fort Worth	Fort Worth	Fort Worth	Fort Worth
May	Boston	New York	Boston	New York
June	Anchorage	*Fort Worth - ODA*	Anchorage	
July	Atlanta	Denver	Chicago	Denver
August	Seattle	Seattle Los Angeles *Boston - ODA*	Seattle	Seattle
September	~~Chicago~~	~~Los Angeles~~	Los Angeles	Los Angeles
October	Los Angeles	Atlanta	Atlanta	Atlanta
November	Chicago	(Blank)	(Blank)	(Blank)

Recurrent Seminar Technical Sessions

- **Entirely web based**
  - *Electrical Systems and Structures completed in June and July 2012 (respectively)*
  - *Flight Test, Mechanical Systems and Propulsion released in April 2013*
- **Response to online courses has thus far been very positive**
  - *Most designees appreciate the ability to complete training on own time in own location*

Development of New Courses

- **Training Cycles – Phase approach**
  - *Up to now all topics (General Session and all Technical Sessions) changed every two years*
  - *Topics will continue to change every two years*
    - Note: Some topics are continued past two years, but they have have updated content.
  - *Course development:*
    - Electrical and Structures cycle - available on even years
    - Flight Test, Mechanical Systems, and Propulsion - available on odd years (See Table)\
  - *Changes on the Horizon*
    - Individual Courses released as available
    - Designees able to pick from list of courses
    - Yearly or Bi-Annual Training Tuition (flat rate)

Course Certificate

- **Course Certificate: Issued after up to 4 hours after successful completion.**
  - *If you do not receive a course certificate:*
    - Grade not recorded: System error, browser, etc.
    - User did not meet the course requirements:
      - For example, user completed 4 of 6 topics. Requirements are provided at registration (DRS), in the course and course printout.
  - *Do not wait until Jan after the course expires to figure this out*
  - *You may retrieve your current and past certificates from DRS (see FAQ webpage)*

Course Instructions

- **Course Instructions are provided to help you successfully complete a course. Instructions are provided on**
  - *Blackboard Designee Tab*
  - *Course Menu of each course*
  - *"How to use this course" overview*
  - *New courses will have system requirements on the 1st page.*
- **'Next' button not available – read user navigation instructions on the lower left hand corner of course page. Examples include:**
  - *Click on the FAA Expert icon to learn more. Then click on the Next arrow to continue.*
  - *Click on the graphic to view the video. Then click on the Next arrow to continue.*

Further Improvements Coming

- **We hope to be able to create a system that provides more individualized training**
- **Current Plan:**
  - *Designees would complete "Core Courses" based upon their specific authorization*
  - *Other topics within that discipline will be identified as "Specialty" Courses*
  - *Designees will be required to complete all "Core" Courses within their discipline*
  - *Designees may be required to take a certain number of "elective" courses that they will be able to choose*
  - *This will significantly reduce the designees completing material that does not apply to their actual authority*

We Need Your Help!

- **Feedback:**
  - *Engineering Designee Seminar Program is YOUR program*
  - *Most topics come from field suggestions (Designees, ACOs, Directorates, etc.)*
  - *Future changes/improvements will include input from our designees*
  - *There are many ways YOU can provide input*
    - End of course Survey
    - Website: Contact us Email: 9-AMC-EDR-Training@faa.gov
    - Each course provides a Contact Us button

Contact Us

Please allow time to look into your problem and respond. The program is growing and we are doing our best to respond to all inquiries in a timely manner.

1. For content specific questions each course will now have contact information for the Subject Matter Expert (SME) for that course. Please contact the SME for content related questions.

2. Preferred Method: Email: 9-AMC-EDR -Training@faa.gov. Each course has a Contact Us Menu Item. Provide as much information as possible:

- Be sure to include the following information:
- Course Number and title for example: (27200106) Electrical: Electronic Flight Bag
- Page Number: Page 5 of 25
- Explain the error found
- Provide a screen shot if possible

3. If you decide to call and leave a Message:

- a. Clearly Provide your full name. Not a nick name -- name as it appears in DRS.
- b. Course #, Lesson and problem: We can troubleshoot and perhaps correct the issue if we have the details before we contact you by email or returning your call.

Questions

Stump the Regulator

Presented to: 2016 Engineering Recurrent Seminar

Stump the Regulator

- **Open Q&A session with everyone from FAA Headquarters on stage**
- **We reserve the right to tap into local FAA knowledge**
- **Any question relating to delegation of any kind is fair game**
- **Prize to those who manage to stump us**

Note: Not liking our answer is not stumping us

Sample questions

- **Question:**
  - As a DER I last took the general session training in Sept of 2014. My renewal is in Aug of 2016. Can I be renewed or do I have to take the training before?
- **Answer:**
  - Yes, you can. The training requirement is once every 2 calendar years, which means you have until **Dec 31st of 2016** to take the training in this scenario.

Sample questions

- **Question:**
  - Can a Repair Specification be created for minor repairs?
- **Answer:**
  - No, Repair Specification approvals are for major repairs ONLY. Minor repairs only require acceptable data not approved data and therefore no 8110-3 or 8100-9 is required.

    Ref 8110.37E and 14CFR 43

Sample questions

- **Question:**
  - I see there is something called a “vintage DER” Do I have to have that before I can work on Vintage Airplanes?

- **Answer:**
  - No, a vintage DER is a DER who did not meet all the qualifications of a DER but who has demonstrated expertise in a certain type of vintage aircraft.

    Ref 8110.37E

Questions before we begin?

Ok, then let’s see if you can STUMP THE REGULATORS

What’s New ?

Presented to: 2016 DER Recurrent Seminar

What’s New?

- History
- Concept
- Feedback

What’s New? Topics List

- Recent Policies
- Defense of the Designee System
- Update to Designee Management System (DMS) schedule
- Repairs and Repair Specifications
- Additive Manufacturing
- Updates to the DER Handbook (8110.37)
- §23 Re write

Recent Policies

- **Where can Policy information be found?**
- **http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/**
- **This site contains Policy that has yet to be incorporated in FAA guidance**

Recent Policies

- As an example, we recently published a memo allowing for the delegation of Emissions findings
- Policy number AIR100-14-140-GM13
- This policy allows ACO's to delegate to qualified individuals findings of compliance to 14 CFR part 34
- It also provides for the delegation to ODA's

Questions?

Defense of the Designee System

Presented to: 2016 DER Recurrent Seminar

Defense of the Designee System

- **Why do we make the changes we do?**
- **Why are we tracking and documenting more?**

Defense of the Designee System

- **Congress instructs the FAA on what to do**
  - How do they make sure we are doing what they told us to? They audit us
  - The Government Accountability Office or Office of the Inspector General conduct audits of the FAA
- **Additionally, other Countries, when deciding whether or not to accept FAA findings conduct audits of our system**

Defense of the Designee System

- **Designees are a large part of our system**
- **Naturally audits of our system spend a large portion of time focusing on how we manage the designee system**

Defense of the Designee System

- **We need to be able to answer, with data, the following types of questions:**
  - How are the FAA designees:
    - Trained?
    - Appointed?
    - Terminated if needed?
  - How does the FAA ensure:
    - Findings made by designees are correct?
    - Initiate corrective action on designees?
  - How does the FAA determine what to delegate?

Defense of the Designee System

- **The first, best defense of our system is our accident rate, and we use that**
- **But we also need to be able to point to documented processes that answer those questions**
- **This is what drives a lot of the changes you see in our orders and things like our new DMS tool**

Questions?

Designee Management System (DMS)

Presented to: 2016 DER Recurrent Seminar

What is DMS?

- **DMS is a web based tool for the FAA to use in managing its designees**
- **Created in Response to a Government Accountability Office (GAO) audit of the FAA**

What will DMS do?

- It will roll up
  - Appointment
  - Renewal
  - Terminate

  as well as provide for the management of the delegation
- Link with NACIP, our conformity delegation program

Current Deployment Schedule

- **DMS is up and running for Manufacturing Designees, and Aeromedical**
- **AFS is next**
- **DERs are last and should be transferred in the Fall of 2017**

Electronic 8110-3

- One of the major changes
- Short of a system failure, will be the only way to file a 8110-3
- Will be a series of questions, then program generated form for authorization
- Will be able to use past forms to generate new ones
- Will no longer have to submit forms to ACO

Questions?

Repairs, Alterations, and Repair Specifications

Presented to: 2016 DER Recurrent Seminar

Repairs & Alterations

8110.37E defines a repair as:

A repair is the restoration of a damaged product or article accomplished in such a manner and using material of such quality that its restored condition will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness)

Repairs & Alterations

8110.37E defines an alteration as:

An alteration is the modification of an aircraft from one sound state to another sound state; the aircraft meets the applicable airworthiness standards both before and after the modification.

Repairs & Alterations

Q: When can a DER be involved?

A: When data must be approved

Q: When does data have to be approved?

A*: Only* for a major repair or major alteration

Repairs & Alterations

- It is not the DERs responsibility to determine whether or not the repair or alterations in major or minor
- It is the responsibility of the entity (IA, Repair Station, etc.) returning the aircraft to service to determine the type of data (acceptable or approved).
- Ref AC 43-210 301(b)

Repairs & Alterations

- The requirement for approved data vs acceptable data is a combination of 14 CFR Part 43 which tells you that all maintenance tasks must be done with data acceptable to the FAA. It also specifies who can perform maintenance tasks.
- Then, the operational rules i.e. 65, 145, 121, 135, etc. contain the requirement for FAA approved technical data for major repairs and alterations

Repairs & Alterations

§43.13 Performance rules (general).

(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use…methods, techniques, and practices acceptable to the Administrator…”

Repairs & Alterations

- **§65.95 Inspection authorization: Privileges and limitations**

(a) The holder of an inspection authorization may—

(1) Inspect and approve for return to service any aircraft or related part or appliance (except any aircraft maintained in accordance with a continuous airworthiness program under part 121 of this chapter) after a major repair or major alteration to it in accordance with part 43 [New] of this chapter, *if the work was done in accordance with technical data approved by the Administrator*

Repairs & Alterations

§121.379 Authority to perform and approve maintenance, preventive maintenance, and alterations.

(b) A certificate holder may approve any aircraft, airframe, aircraft engine, propeller, or appliance for return to service after maintenance, preventive maintenance, or alterations that are performed under paragraph (a) of this section. *However, in the case of a major repair or major alteration, the work must have been done in accordance with technical data approved by the Administrator.*

Repairs & Alterations

§135.437 Authority to perform and approve maintenance, preventive maintenance, and alterations.

(b) A certificate holder may approve any airframe, aircraft engine, propeller, rotor, or appliance for return to service after maintenance, preventive maintenance, or alterations that are performed under paragraph (a) of this section. *However, in the case of a major repair or alteration, the work must have been done in accordance with technical data approved by the Administrator*.

Repairs & Alterations

§145.201 Privileges and limitations of certificate.

(c) A certificated repair station may not approve for return to service

(2) Any article after a major repair or major alteration *unless the major repair or major alteration was performed in accordance with applicable approved technical data*;

Repairs & Alterations

- **What does all that mean?**
- **Basically all repairs and alterations need to be done in accordance with data *acceptable* to the FAA, the exception is that all *major* repairs and alterations must be done in accordance with technical data *approved* by the FAA**

Repairs & Alterations

This is explicitly spelled out in Order 8110.37 4-12 (a) and (b)

*Major alterations and major repairs **must** be accomplished in accordance with technical data approved by the Administrator*

*Minor repairs and minor alterations do not require FAA engineering approval. As such, DERs **cannot** approve minor repairs or alterations.*

Repairs & Alterations

- Yet, we are still seeing repair and alteration approvals via 8110-3s for what are clearly minor repairs and alterations
- While the determination of whether or not a repair or alteration in major is not the responsibility of the DER, we do expect you to follow the order and NOT approve data for what is clearly a minor repair/alteration

Repairs & Alterations

- **Not following our system for return to service after a repair or alteration causes confusion on the part of mechanics and inspectors**
- **If they always see an 8110-3 approving data, *even when it's not necessary*, they expect to always see one**
- **This results in hardship for those that follow the system where they have to explain one is not needed**

Repair Specifications

- **Have been required for all multiple non serial number specific, non DAH repairs since 2012**
- **Generally working well but there are some issues**

Repair Specifications

- This first is what we just talked about for single repairs.
- Repair Specifications are only for major repairs
- Second are issues with using Repair Specifications as a means to circumvent PMA
- Third using them to repair TSO articles with no certification basis established

Repair Specifications

- Example of issues 1 and 2
- A repair specification came in to ACO as recommend approval for a fuel probe clamp
- The only data associated was a drawing showing how to cut and bend a piece of sheet metal to fabricate the clamp
- Basically they were using a DAH maintenance procedure but wanted to manufacture the clamp

Repair Specifications

- NOT a major repair
- There are acceptable methods to fabricate a part during maintenance where the next higher assembly level is returned to service but they require a quality system
- A repair specification is not the correct path

Repair Specifications

- We are currently working on an INFO for seat belts specifically
- Seats belts are a good example since for the case of dynamic seat requirements the fact the seat belt as repaired meets the TSO may not be sufficient to allow it to function properly with dynamic seats.
- This makes it necessary to know the certification basis in order to determine if the as repaired part can meet the required regulations

Repair Specifications

- **General Guidelines for Repairs to TSO articles**
  - A repair to a TSO article is the same as a repair to any other aircraft part you must:
    - Know the certification basis in order to determine which regulations apply and need to be found in compliance
    - Identify if the data you are approving is not the complete data set required
- **The ONLY difference is that in the case of a TSO article being repaired you must evaluate whether it still meets the TSO and if not mark out the TSO marking**

Questions?

Additive Manufacturing

Presented to: 2016 DER Recurrent Seminar

Additive Manufacturing

- **Definition**
- **Existing Policy**
- **Expectations of Designees**

Additive Manufacturing

- **Additive Manufacturing (AM) also known as "3D Printing" refers to a range of fabrication methods, both metallic and nonmetallic, where basic material forms (such as metallic powders, wire, resin, etc.) are processed in a machine to produce near-net shape parts**

Additive Manufacturing

- **Link to recent memo to ACO's regarding AM**
- **http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgPolicy.nsf/0/6AB4787EF524BF0786257F0700597E6B?OpenDocument**
- **Or just search rgl.faa.gov under "Policy" by issue date and look for June 3, 2015**
- **Requests certain information about projects involving AM to the FAA AM National Team, AMNT**

Additive Manufacturing

- **The list of information requested is as follows**
  - Company name
  - Type of application (e.g., TC/ATC/STC, PMA)
  - Product type (e.g., engine, aircraft part)
  - Make, model, component or part
  - Part criticality
  - Specify the AM manufacture methodology (e.g., polymer, metal, etc.).
  - ACO point of contact (e.g., project engineer)
  - DER involvement: Yes or No.
    - If yes, what regulations are/were used for showing compliance?

Additive Manufacturing

- **At this site you'll see that the Transport Airplane Directorate lays out the need for an Issue paper if AM is to be used**
- **https://www.faa.gov/aircraft/air_cert/design_approvals/transport/media/rptTAIListForPublicWeb.PDF**
  - You may need an issue paper to establish a means of compliance with §§ 25.603, 25.605 and 25.613 to develop appropriate design values for additive manufactured materials that account for variability in materials, geometry and manufacturing processes

Additive Manufacturing

- **What does this all mean for the designee?**
- **Basically AM is a new fabrication method and the FAA would like to make sure we understand how it's being used**
- **To that effect we may require information from you and even Issue Papers if warranted**

Additive Manufacturing

- **If you are involved in projects or activities that use AM please contact your advisor for the latest FAA policy**
- **In the CD and in your booklet you'll find a copy of a checklist put together by the Transport Airplane Directorate that will provide a starting point of basic questions**

Questions?

Rev F to Order 8110.37

Presented to: 2016 DER Recurrent Seminar

What’s planned for in 8110.37F

- 8110.37F is not out yet, but is projected to be out for comment by summer of 2016
- Here are some of the changes planned
  - Remember nothing is final or required until the order is published

What’s planned for in 8110.37F

- **No more DER Candidates**
  - anyone who fit the previous description will now be a DER with authority limited to Recommend Approval only
- **A note will be added to address the removal of Administrative and Management DERs**
  - Management function will now be a special authority similar to Repair Specification
- **Added a section on rescinding an 8110-3 after it’s been issued**

What’s planned for in 8110.37F

- **Adding a section on repair of TSO products**
  - Cannot just repair a part that was produced under a TSOA to the TSO
  - Must address the certification basis of the product upon which the repaired part will be installed on

Questions?

14 CFR Part 23 Rewrite

Presented to: 2016 DER Recurrent Seminar

14 CFR Part 23 rewrite

- **The entire part 23 has been rewritten**
- **It will be less prescriptive**
- **The philosophy will be to have the WHAT we want to happen in the rule (e.g. keep occupants from severe injury during a crash) and put the HOW into Method Of Compliance (MOC) documents**

14 CFR Part 23 rewrite

- **The rule and the MOC documents will be used together to show compliance**
- **Initially the new form (Rule and MOC documents) will look very similar to the current 14 CFR Part 23 at amendment 62 because that was our starting point for the ASTM documents**
- **As time goes by changes to the ASTM MOC's and other accepted MOC documents will result in a more streamlined process for applicants**

14 CFR Part 23 rewrite

- **This is a rather dramatic departure from the past**
- **The comment period has closed and the comments are currently being evaluated**

Questions?

Level of FAA Project Involvement

Presented to: 2016 DER Recurrent Seminar

What is Level of Project Involvement (LOPI)?

- **How much or how little the FAA participates on each project**
- **FAA participation includes employees and designees**
- **Applicant's actions may or may not be affected.**

Examples:

- Accept test data that shows compliance
- Require test to be performed with designee involvement
- Require test with ACO engineer involvement

How does FAA determine LOPI?

- **Part of Compliance Planning**
- **Required vs optional (discretionary)**
- **Where does involvement derive the most benefit?**
  - Decisions or events critical to safety
  - Based on project team member experience
  - How complex is the requirement?
  - Confidence in applicant
  - Applicant’s experience
  - Internal processes
  - Proposed designees

Why is FAA allowed to vary LOPI?

- **FAA has Limited resources**
- **Applicant is responsible for compliance**
- **Applicant's must make a certifying statement of compliance**
  - Statement required prior to receiving design approvals.
  - Based on certification activities that show compliance and how compliance was managed (via a compliance listing, for example)

The applicant ALWAYS has to show compliance FAA has discretion in how we determine Compliance

FAA Discretion

- **FAA has discretion to determine how much or how little of an applicant's showing to review (Designees don't have this discretion)**
- **FAA makes the level of involvement determination based on risk**
- **Risk determination has been made subjectively in the past**
- **Risk Based Decision Making (RBDM) tools can assist in these determinations**
  - 14 CFR part prioritization
  - Risk Based Resource Targeting

How does Risk equate to Level of Involvement?

- **Project areas have various risks associated with them, but the LOPI decision focuses mainly on <u>safety risk of a noncompliance</u>**
- **This risk is made up of the severity (consequences) of a noncompliance combined with the likelihood of the noncompliance occurring**
- **Contributors are**
  - Relative risk rating of each rule section
  - Applicant experience
  - Designee experience
  - Safety record

Where and how is the FAA involved based on risk "Levels"

- **The outcome of the safety risk process is relatively simple, resulting in it either being High, Medium, or Low**
  - **High** suggests direct FAA involvement
  - **Medium** suggests FAA involvement through designees
  - **Low** suggests that FAA resources aren't necessary and the FAA can rely on applicant's submittal without review ("applicant showing only")

Why “Applicant Showing Only” is a benefit

- **FAA uses delegation to leverage its workforce, doing what ACO staff would otherwise do**
  - Managing delegation requires applicant and FAA resources
  - Applicant capability contributes to delegation decisions
- **Applicant capability may also reduce resources needed**
  - Example: Compliance demonstration without FAA/designee involved provides applicant more control of cost and schedule
  - May still rely on DER workforce directly or indirectly
- **Robust applicant capability is the foundation of Safety Management System (SMS) approach to certification**
  - Approved Design Organization (ADO)
  - Certified Design Production Organization (CDPO)

Applicant Showing

- **Reflected in policy**
  - Streamlined PMA Order 8110.119 (11/30/12)
  - Guidance for Recognition and Use of Applicant Showings on Standard Certification Projects AIR100-15-150-PM16 (9/30/15)
- **Future**
  - 8110.4D Type Certification
    - Promotes applicant responsibility and ability for FAA to adjust involvement based discretion
  - 8100.15C ODA Procedures
    - Applicant capability is largely established as a prerequisite to ODA
    - FAA involvement decision is largely made as part of the ODA authorization
  - FAA LOPI Order

Implementing an efficient LOPI decision process

- **Depends on partnerships working toward a common goal**
  - Define what FAA and applicant want the future to look like
  - What will it take to get there?
- **Pursue applicant showing without FAA involvement**
  - Largely untapped resource
  - Follow AIR Policy Memo which allows it for Low Risk
  - Start simple: conformity, witnessing, and low risk testing/findings
  - Future: More complex for data analysis and testing and may depend on
    - People
    - Processes
    - Auditing

FAA Level of Involvement and DERs

- **A DER is an FAA compliance finder**
- **A DER was previously a compliance showing expert**
- **FAA LOI depends on applicant's compliance showing expertise**
- **What FAA LOI means to you**
  - Defines what you'll do on FAA's behalf
  - Possibly results in what you'll do on the applicant's behalf
  - Could increase your value to the applicant

Summary

- FAA level of involvement should be determined by risk level
- Applicant always has to show compliance and provide method that they used to do so
- FAA has discretion and can reduce resources by limiting involvement where appropriate
- FAA has already reduced FAA resources by using designees
- Further reduction possible by recognizing applicant showing and focusing designee resources
- Applicant capability foundation of future SMS approach

Additive-Manufacturing Sample Checklist

Introduction:
The introduction of additive-manufacturing (AM) in the production of commercial aviation parts presents a unique challenge for certification. The term additive-manufacturing does not describe one manufacturing method, but a wide range of methods, each with its own set of concerns and requirements. The checklist provided herein is not intended to be comprehensive list of all the questions that need to be addressed to accomplish certification of an AM part, but to provide a basic list of initial questions.

The compliance plan for a given AM part will be affected by:

- Component Design Requirements:
    - Part classification (e.g., safety critical, durability critical, non-critical)
    - Materials substitution (are you changing the material system? From what to what?)
      Note: Material chemistry alone does not dictate material properties. Using the same material with additive-manufacturing may not yield the same properties.
    - Extent of available technical data for the component's requirements
- Component Geometry Requirements:
    - Part size (total envelope and volume)
    - Part complexity (surface area-volume ratio, fraction envelope solid, symmetry)
    - Dimensional conformance requirements
    - Surface finish requirements (including internal features where applicable)

Taking into consideration the above factors, an assessment of regulatory compliance needs to address the following:

Basic Materials Requirements: (§25.603)

- What is the applicant's experience with the AM material being proposed?
- Are the constituent materials to be used in the AM process being purchased per a recognized industry specification, or an internal proprietary material specification?
    - If using an industry specification, is it from an FAA recognized source and are there any additional controls being applied to ensure the applicant is receiving the correct material?
    - If using an internal specification, how is FAA approval being sought?
- What testing was conducted to validate that the material selected is suitable for the applicants intended application?
- How has the applicant taken into account the operational environment in selecting the material?
- Has the applicant generated mechanical property curves for the material from test samples produced via additive-manufacturing using parameters representative of parameters to be used to make parts?

Basic Process Requirements: (§ 25.605)

- What AM process is being proposed?
- What is the experience of the applicant with this process for manufacturing parts?
- How were the key process parameters identified and what controls were established?
- How is the applicant proposing gaining FAA approval of their process specification?
- What AM machine process is the applicant using to qualify it to that process specification? (If multiple machines will be used, is each machine qualified independently?)
- How are key process parameters being monitored for quality control?
- What testing was conducted by the applicant (or being proposed) to verify that the AM process proposed provide a stable and repeatable product?
- What inspections are being used to verify that the final product has been manufactured correctly?

Inspection Methods:

- What are the possible defects in the final parts for which final part inspections will be conducted?
- What are the defect limit sizes and how were they established?
- What NDI inspection methods are being proposed to detect the defects during production?
- How were these NDI methods validated?

Development of Strength and Design Values: (§25.613)

- Are the AM manufactured articles from which test specimens are being extracted representative of actual production parts?
- What sampling plan is being used to capture the variability of the material being purchased and the AM process being used to manufacture parts?
    - How a material batch being defined, and how many batches are being tested as part of the design values program?
    - How a production lot being defined, and how many lots are being tested as part of the design values program?
    - Is the material used more than once (e.g. recycling powder bed material)?
- How is the expected operational environment of the part being accounted for in the design values test program?

Application of Special Factors: (§ 25.619)

- Was the testing conducted to derive design values required by § 25.613 sufficient to capture the variability of part being fabricated?
    - Were the specimens used to derive design values extracted from representative production parts, or individually produced? (If specimens were individually fabricated they may not capture the variability of what is actually being produced.)

- Are specimens are being extracted from representative parts but, because of part geometry, specimens can’t be obtained from all key grain directions?
- Did the test program encompass all the variables in the AM process, machine, and material stock?