FAA DER APPROVED
Modifications, Repairs & Alterations
RS-DER Workshop

Sponsored By Gorham-Tech

March 20, 2017

Dominick DaCosta

FAA DERT / RS-DER /DARF

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- FAA data herein is available at **www.FAA.gov**

About your Instructor

FAA DER-T:

Engines *Chart E*

Powerplant *Chart B*

Systems *Chart C1*

Structures *Chart A*

- PMA ID Findings Authority
- Major Repair/Alterations Multiple Use Authority
- RS-DER Authority

FAA DAR-F: Class I, II, and III Parts

About your Instructor

EXPERIENCED:

- **37 years Aerospace Manufacturing Engineering**
- **23 years Engine/APU Maintenance & Repair Engineering**
- **17 years presenting Gorham Workshops**

CONNECTED *(Clients and former employers):*
GE, P&W, Textron/Lycoming, Rolls Royce, Honeywell APU, Garrett Engine, Bendix Fuel Controls/Brake/LG, CTL Inc., United Airlines, CRT, American Airlines, Exotic Metals, Soundair, Lufthansa, MTU, Alitalia, Air France, FedEx, Iberia, ITT, Hamilton Std., Parker, Rexnord, SR Technics, ACS, Eaton, SW Airlines and more.

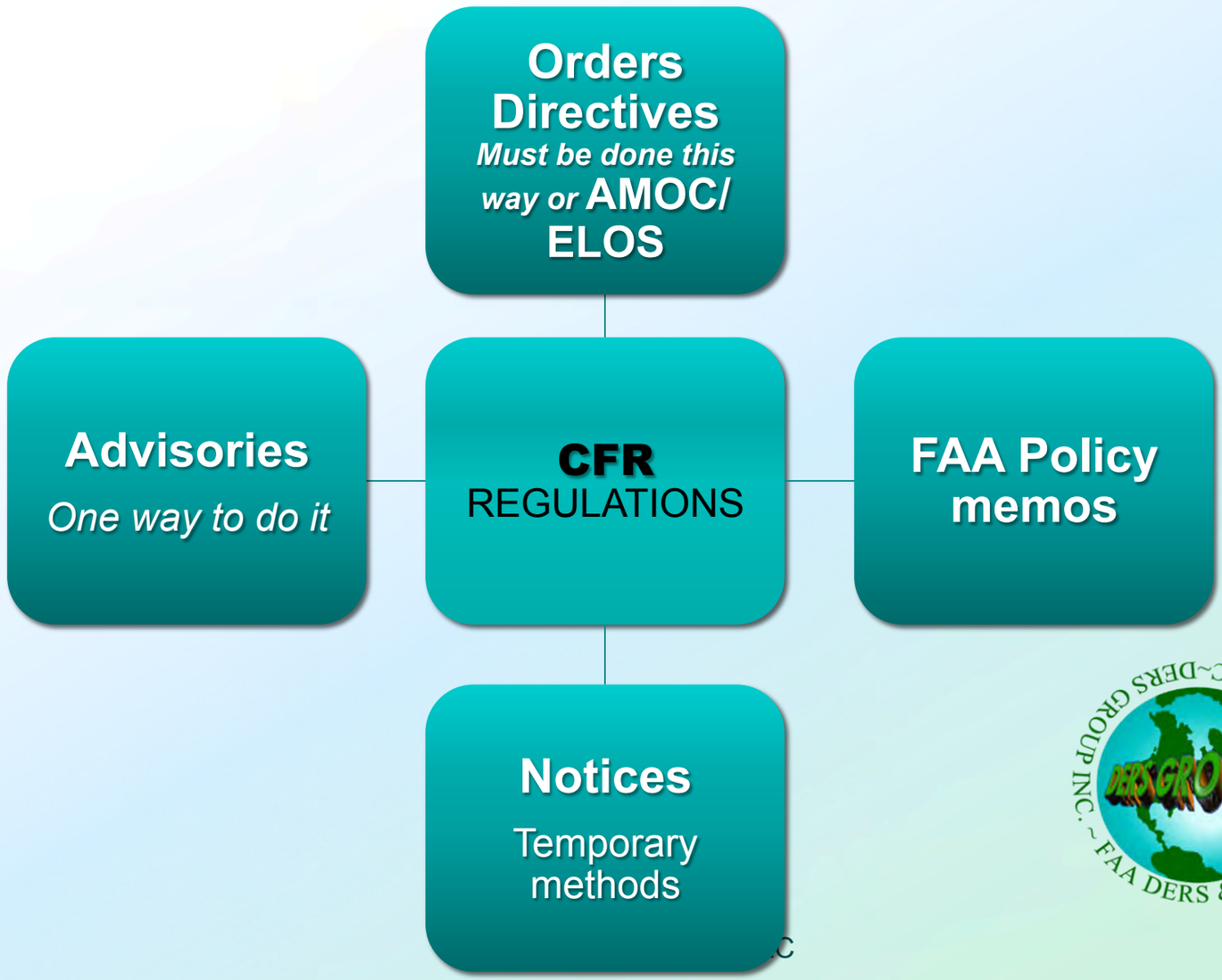
About your Instructor

EDUCATION / TRAINING

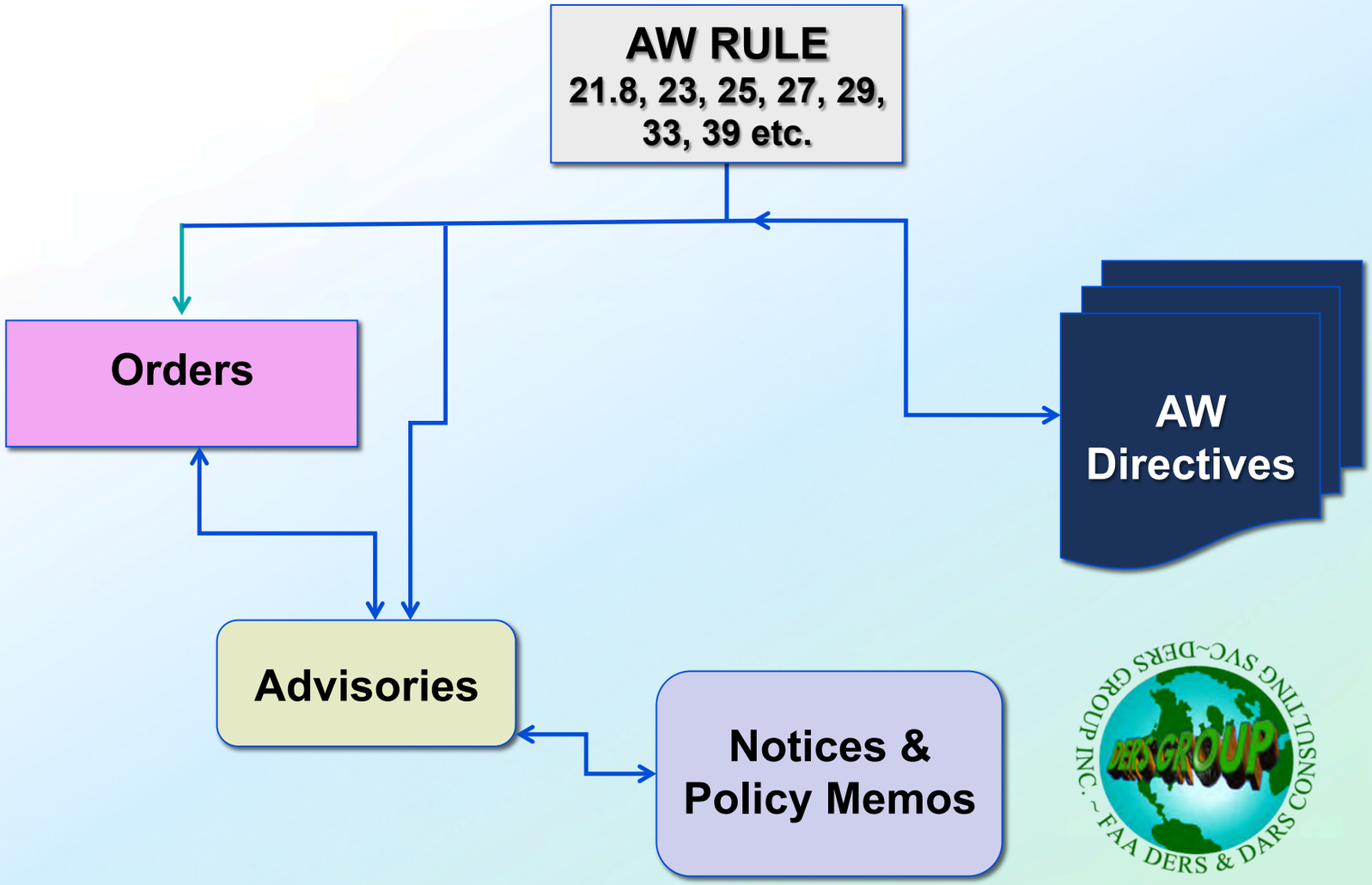
- ASNT Level III Since 1976~2017
- Licensed FAA A&P Mechanic
- Certified by National Institute for the Certification of Technologist [NICET~NSPE]
- Senior Welding Engineering Technologist 1979 ~ 2017
- Indiana University - BGS
- Ohio State University - Welding Engineering

  BWE Certification Program.
- Massachusetts Institute of Technology - Thermo Mechanics Program
- Kings Aeronautical Institute of Technology – Power-plant Technology

UNDERSTANDING FAA POLICY RELATIONSHIPS & STANDINGS



INTER RELATIONSHIPS
FAA POLICIES & RULES



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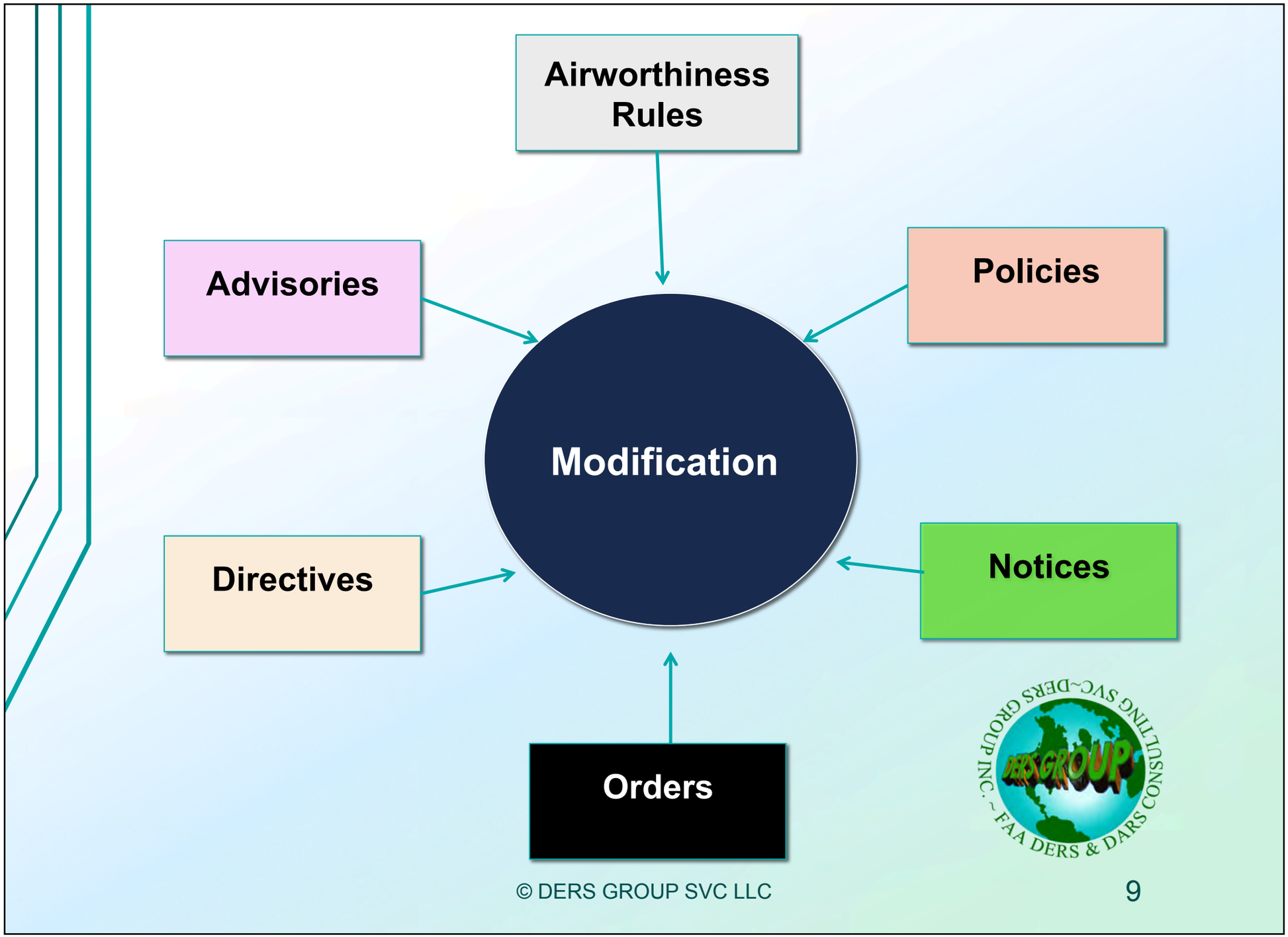

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FAA ADVISORIES

- **AC21.47** [AIR100] Sep 29, 2010, "Submittal of Data to an ACO, DER or ODA for a Major Repair or Alteration".
- **AC3.9** [ANE110] Apr 20, 2010, Developing Data for M/R of Turbine Engine Parts.
- **AC33.10** [ANE111], Aug 8, 2014, "Statistical Analysis Considerations for Comparative Test and Analysis Based Compliance Findings for Turbine Engine and Auxiliary Power Unit Replacement, Redesign and Repaired Parts"
- **AC43.18 chg 2** [AFS300], Jun 7, 2011, "Fabrication of Aircraft Parts by Maintenance Personnel. [Consumed in the modification].
- **AC43-210A** [AFS300], Aug 17, 2016, "Standardized Procedures for Obtaining Approval of Data Used in the Performance of Major Repair /Major Alterations

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WHAT'S NEW IN FAA
MAJOR REPAIR/or RS-DER NATIONAL POLICIES

FAA ORDERS:

- **8110.37E** [AIR110] 2011 DER Handbook – Redefined Sect 4-12 Multiples & 4-13 RS-DER
- **8100.17** [AFS300] 2011 Field Approvals – Phase in of DART to sign off 337 with DER approved data. [Function Code 51].
- **8300.16** [AIR100/AFS300] 2014 – Major Repair & Alt Approval Data.
- **8300.13** [AFS300] 2003 – Repair Assessment
- **8100.15a** [AIR110] 2010 – ODA A/R's
- **8900.1** [AFS300] – Vol 4 – Chap 9

✧ **Next, we'll focus on 8300.16 [AIR100/AFS300] 2014 Major Repair & Alt Approval Data.**
Release date: April 18, 2014.

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Order 8300.16 continued

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

National Policy

ORDER
8300.16

04/18/14

SUBJ: Major Repair and Alteration Data Approval

This order provides guidance on the responsibilities and requirements for the approval of technical data associated with major repairs or alterations. Types and sources of technical data are discussed. Considerations that must be addressed in the development of technical data to substantiate major repairs or alterations are also addressed. This order does not provide guidance for making decisions on major or minor changes in type design.

NOTE: 8300.16 has phased out a large portion of 8900.1 Volume 4 Chapter 9 guidance.

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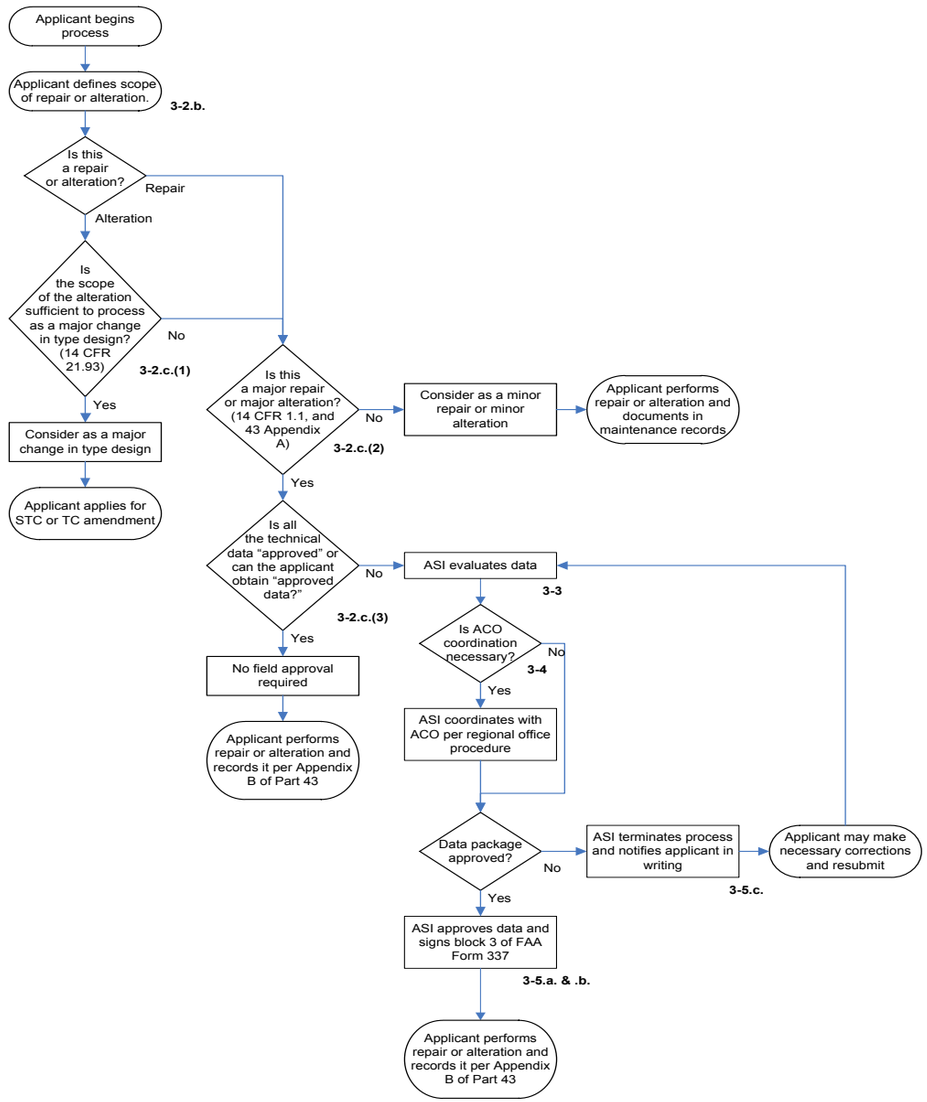
Figure 3-1. Repair and Alteration Data Approval Process Overview



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3-2. Initial Review.

a. This section presents an overview of what an ASI or appropriately authorized designee must review upon initial receipt of an applicant's major repair or major alteration data package for approval.

b. The applicant may use advisory circular (AC) 43-210, *Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs,* or another method acceptable to the FAA, to define the scope of the repair or alteration and develop the associated data.

c. The ASI or appropriately authorized designee must review the applicant's package and confirm that the repair or alteration qualifies as a major repair or alteration. The ASI or designee must:

(1) Refer to the Major Repair and Alteration Data Approval Job Aid in order to confirm that the project is within the scope of a field approval. If it is determined that the alteration requires an STC, inform the applicant to apply for an STC or amended TC (if the applicant is the design approval holder (DAH)).

(2) Confirm that the applicant, in accordance with 14 CFR 1.1 and part 43, appendix A, properly determined that the repair or alteration is major. Minor alterations and repairs do not need approved data and, therefore, do not require approval.

(3) Examine the data and determine if all of the data for the project has been approved. If all the required data is approved, then a field approval or STC is not required. If all of the required technical data is not approved, then additional approvals (i.e., DER-approved data) or a field approval are necessary. The compliance checklist in AC 43-210 may be used.

d. ASIs or designees who deny data approval requests for alterations or repairs that do not need or qualify for approval must explain to the applicant the reason for the denial and, if requested, provide the reason(s) in hard copy or electronic form.

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(1) Does the data meet the applicable airworthiness requirements?

(2) Does the installation meet the requirements of the applicable rules?

(3) Are there any model-specific issues that would affect accomplishment of the proposed major repair or alteration? For example, an airworthiness directive (AD) or a limitation contained in the TCDS that requires ACO consultation for alteration of specific systems.

(4) Do the installation instructions provide adequate detail to complete the installation on the aircraft?

(5) Is the intended function described and appropriate for the aircraft? If based on previously approved data, is the intended function the same as was approved by the original data?

(6) Are the current or proposed instructions for continued airworthiness (ICA) or maintenance instructions adequate for the proposed repair or alteration? (Refer to chapter 5, *Maintenance Information and Instructions for Continued Airworthiness*).

(7) Is the equipment being installed required under 14 CFR parts 23, 25, 26, 27, 29, 121, or 135?

(8) Is the equipment approved per 14 CFR 21.8?

Note: Any installed equipment must still meet the airworthiness requirements of the product on which it is installed.

(9) Has substantiating data been provided that will enable approval of the repair or alteration?

(10) Is a flight manual supplement required? If so, is it provided? (Refer to chapter 6, *Aircraft Flight Manual Supplements*.)

(11) Will a flight evaluation be performed? Has it been addressed in the documentation? (Refer to chapter 7, *Flight Evaluation and Flight* .)

(12) Have applicable, specific considerations been addressed? (Refer to chapter 8, *Technical Considerations*)?

Note: This list is not all-inclusive.

b. Aircraft Airworthiness. The applicant must have conducted an evaluation in order to ensure that a proposed repair or alteration will not impact the airworthiness of the aircraft. The applicant will provide verification that the aircraft has been inspected and any aircraft records

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have been reviewed in order to ensure compatibility of this repair or alteration with previously approved changes to the aircraft.

c. Effect. The technical data that a major repair or alteration may require must be determined based on the specifics of each application. Installation of equipment or a system that does not have a primary function in flight operation and whose failure would have no adverse effect on the ability of the flight crew to properly perform their duties and does not involve complex interface still requires sufficient data to show compliance with the certification basis and all applicable requirements. In contrast, an alteration that, if it failed, would have more serious consequences would require more extensive substantiation and supporting technical data.

d. Compliance with Airworthiness Standards. The repair or alteration data must show compliance with the pertinent certification basis for the aircraft in question. This will include the basic airworthiness standards and, in addition, any special conditions or equivalent level of safety (ELOS) findings that may be applicable, including previously accomplished STCs or major alterations.

e. Operational and Equipment Requirements. An alteration's effect on required equipment and the aircraft operational capability must be considered in the evaluation of the data package. It is important to ensure that an alteration does not inadvertently change the operational capability of the aircraft.

3-4. ACO Coordination Determination.

a. This section presents an overview of necessary considerations to determine if engineering assistance is required.

(1) Review the applicant's data package and consult the Major Repair and Alteration Data Approval Job Aid for the approval path to be followed.

(2) The job aid describes methods of approval for typical major alterations. The job aid is not all-inclusive. The ASI must evaluate each project on a case-by-case basis.

(3) Items not listed in the job aid must be independently evaluated.

b. If the repair or alteration requires additional engineering-approved data, but does not necessitate ACO involvement, the ASI identifies the data necessary to complete the substantiation of the repair or alteration. The ASI will direct the applicant to use AC 21-47, *Submittal of Data to an ACO, a DER or an ODA for a Major Repair or a Major Alteration,* for guidance. The applicant documents the data on FAA Form 8100-9 or FAA Form 8110-3.

c. ACO-coordinated Field Approval.

(1) A coordinated field approval is one in which an ASI requests FAA engineering to provide an evaluation of the field approval application and accompanying technical data. The

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ASI requests a concurrence or non-concurrence with the technical data provided to support the major repair or major alteration.

(2) A coordinated field approval is initiated when it is determined that a proposed repair or alteration (project) may, because of its scope and complexity, be beyond the expertise of an ASI to approve. The ASI "coordinates" the field approval with an ACO. Alterations requiring a flight manual supplement may have to be coordinated with the ACO, unless ASIs have been specifically authorized to sign the document(s).

(3) An ASI requests ACO engineering assistance following FSDO or regional office (RO) procedure. The ASI should submit a copy of the entire package and identify the elements of the project that require ACO participation.

(4) If the ACO determines that the intended alteration introduces a major change to the type design requiring application for an STC, the ASI must officially notify the applicant that the field approval request is no longer appropriate and direct the applicant to contact the ACO directly.

(5) If the repair or alteration requires additional engineering-approved data, the ACO will identify the needed information to the ASI who will then coordinate with the applicant to obtain that data.

(6) If ACO coordination is necessary, the written ACO concurrence (e.g., memo or e-mail) becomes an attachment to FAA Form 337.

3-5. Data Package Approved/Denied for Field Approval.

a. Approval for Data Package Only. If the repair or alteration data substantiates that the repaired or altered product will comply with the applicable airworthiness regulations, record data approval by entering the appropriate statement and signing block 3 of FAA Form 337; then, return both copies to the applicant. When recording FAA approval in block 3, the following statement from AC 43.9-1, *Instructions for Completion of FAA Form 337,* should be used:

> "The data identified herein complies with the applicable airworthiness requirements and is approved for the above described aircraft, subject to conformity inspection by a person authorized in 14 CFR 43.7."

b. Approval of Technical Data by Physical Inspection. ASIs may schedule a physical inspection with the applicant in order to verify workmanship and conformance to the data submitted. If the repair or alteration complies with regulations, record the repair or alteration approval by entering the appropriate statement and signing block 3 of FAA Form 337; then, return copies to the applicant. When recording FAA approval in block 3, use the following statement:

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Chapter 4. Data

4-1. Introduction. This chapter provides guidance related to the sources, use, and approval of data used to substantiate an aircraft major repair or major alteration.

4-2. Types of Technical Data. In the context of this order, technical data means the drawings, specifications, and other material that provide the description and substantiation of an aircraft repair or alteration. There are several ways in which data may be labeled and described.

a. Descriptive Data. Descriptive data describes the design of the repair or alteration. Descriptive data should include reference to: installation methods, materials, fabrication processes, dimensions, and tolerances. It may also include intended function and how the alteration is appropriate to the aircraft.

b. Substantiating Data. Substantiating data shows that the design complies with the applicable regulations and that all appropriate technical considerations have been addressed.

c. Acceptable Data.

(1) Acceptable data means data acceptable to the FAA. The terms "acceptable to the Administrator" and "acceptable to the FAA" appear numerous times in the maintenance regulations. They refer to any item addressed in the regulation (e.g., data; methods, techniques, and practices; manual contents; tools; materials; equipment; etc.) that must meet regulatory standards. If the regulation requires only that an item must be "acceptable to," it does not necessarily follow that the FAA requires the item to have specific FAA review and acceptance before it may be used. A person making a determination of whether an item is "acceptable to" the agency must ensure the item addresses specific applicable section(s) of the regulations.

(2) Items required by regulation to be "acceptable to" the FAA or to the Administrator (unless otherwise required by regulation to be approved) do not necessarily require FAA review and acceptance prior to a person using the item. A person using an item that must be acceptable to the FAA should be able to demonstrate that the item meets all applicable regulatory requirements. If, however, upon subsequent review of the item, the FAA believes the item is not acceptable, the agency has the burden of demonstrating its unacceptability in any related enforcement matter. In any event, if an ASI finds an item unacceptable to the FAA, the ASI must immediately inform the maintenance provider/certificate holder, in writing, of the potential non-compliance and request compliance.

d. Approved Data. Approved data means data approved by the FAA. The term "approved" is based on § 1.1, which states: "Approved, unless used with reference to another person, means approved by the FAA or any person to whom the FAA has delegated its authority in the matter concerned, or approved under the provisions of a bilateral agreement between the United States and a foreign country or jurisdiction." For the FAA ASI, "approved" or "approved by" means the item (data; methods, techniques, and practices; manual contents; tools; materials; equipment; etc.) is required to be and has been reviewed and formally approved by the FAA (or appropriate civil aviation authority (CAA)). Approvals are granted only by letter, by a stamp of

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approval, by the issuance of operations specifications, or by other official means. All data used to substantiate a major repair or alteration, regardless of the source, must be approved before being used.

e. Previously Approved. This term refers to data that was approved for a specific purpose, such as an STC or major alteration on an aircraft, powerplant, propeller, or appliance. All previously approved data has to be applicable to the requested major repair or alteration. All differences, deviations, inclusions, and exclusions between the original use of the data and the current one must be considered before the data can be approved for use. Figure 4-1 identifies possible sources of previously approved data that may be relevant to a major repair or major alteration. Figure 4-1 is not all-inclusive.

(1) Previously approved data on FAA Form 337 for a single product identified in block 1 may be used to substantiate a similar repair or alteration on a different product or article, but it must be evaluated for each new application to determine if, and how much of, the data can be directly approved. Reference to the previous Form 337 itself does not constitute substantiation; the actual data must be available if requested.

(2) Previously approved data may also refer to data that has been approved for use on multiple products or articles. In this case, further review or approval of that data would not be necessary for the products or articles identified in the approval.

(a) An example of this would be data approved by a DER on Form 8110-3 that is applicable to more than one specific serial number aircraft.

(b) Another example would be technical data contained in a repair specification (RS). RSs provide an alternative to major repair technical data. Approval as an RS is required for multiple-use major repairs that do not come from the DAH and do not specifically identify serial numbers of all the products or parts currently in need of repair to which the RS applies. Refer to FAA Order 8110.37, *Designated Engineering Representative (DER) Guidance Handbook,* for more details on repair specifications.

Note: An ASI (or an appropriately rated DAR) approves data on FAA Form 337 for a major repair or alteration to a specific aircraft, powerplant, propeller, or appliance. Prior to September 2002 the FAA permitted approval of data on a single Form 337 for use on multiple aircraft. This practice is no longer permitted. However, multiple approvals can still be used on identical aircraft by the original modifier.

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Figure 4-1. Possible Resources for Approved Data Relevant to Major Repairs or Major Alterations

TCDS. Refer to FAA Order 8620.2, *Applicability and Enforcement of Manufacturer's Data*, for guidance.
Repair data from AC 43.13-1 may also be used as approved data, and the AC chapter, page, and paragraph listed in block 8 of FAA form 337 when the user has determined that it is: • Appropriate to the product that receives repairs; • Directly applicable to the repair being made; and • Not contrary to the airframe, engine, propeller, or appliance manufacturer's repair data or instructions.
Alteration data from AC 43.13-2 may be used as approved data for major alterations when the AC chapter, page, and paragraph are listed in block 8 of FAA Form 337, when the user has determined that it is: • Appropriate to the product being altered; • Directly applicable to the alteration being made; and • Not contrary to the airframe, engine, propeller, product, or appliance manufacturer's data.
ADs.
Appliance manufacturer's manuals or instructions, unless specifically not approved by the FAA, may be used as approved data for major repairs.
Data describing an article used in an alteration which is FAA-approved under a parts manufacturer approval (PMA).
Data developed during the FAA authorization of an article for production under a technical standard order (TSO) when applicable to the repair or alteration intended.
Data in the form of an appliance type approval issued by the Minister of Transport Canada for those parts or appliances for which there is no current TSO available. The installation manual provided with the appliance includes the environmental performance qualification statement.
DER-approved data, including repair specifications, within the limitations listed on the DER's authorization (refer to section 9.5).
ODA-approved data, within the limitations of the ODA holder's procedures manual (refer to section 9.6).
FAA-approved portions of structural repair manuals (SRMs).
FAA-approved service bulletins (SBs) and service letters (SLs) or similar documents as documented in AC 20-77, *Use of Manufacturers' Maintenance Manuals*.
Foreign bulletins, for use on U.S.-certificated foreign designed aircraft, when approved by the foreign authority within the provisions of a bilateral agreement with the United States or as listed in the TCDS notes.
Original aircraft manufacturer's service and repair data in accordance with current regulations, for major repairs on non-pressurized elements of airplanes that are 12,500 pounds or less maximum certificated takeoff weight provided the person intending to perform such repair determines that: • Data is appropriate for the specific make and model airplane being repaired; • Data is applicable to the specific make and model airplane being repaired; and • The repair does not deviate from the manufacturer's methods, techniques and practices.
United States Department of Commerce, Form ACA-337 dated prior to October 1, 1955, provided the data is appropriate, directly applicable, and not contrary to regulatory requirements.
STC data, including that for AML STCs, may be used, if applicable, to substantiate a major alteration on a different aircraft.
FAA Form 337, used by the original alterer for approval of multiple identical aircraft
Note: Maintenance manuals issued by design and production approval holders and certain supplier manuals (i.e., those for which the supplier is the actual designer and producer of an article that is approved under part 21) were developed using part 21-approved technical data. This technical data remains FAA-approved provided the design change requirements of part 21 are followed. Therefore, it does not require re-approval when a major repair or major alteration is performed in accordance with these maintenance manuals.

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Appendix B. Related Publications & References

1. References, Forms and Job Aids.

- 14 CFR parts 1, 21, 23, 25, 27, 29, 31, 33, 34, 35, 36, 39, 43, 91, and 121
- Applicable Special Federal Aviation Regulations (SFAR)
- Order 4040.26 *Aircraft Certification Service Flight Safety Program*
- Order 8100.8, *Designee Management Handbook*
- Order 8110.37, *Designated Engineering Representative (DER) Guidance Handbook*
- Order 8100.15 *Organization Designation Authorization Procedures (ODA)*
- Order 8100.17, *Field Approval Delegation Handbook*
- Order 8110.41A, *Aircraft Certification Service FAA Flight Test Responsibilities, Procedures, and Training*
- Order 8110.54, *Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents*
- Order 8110.118,*Commercial Parts*
- Order 8130.2, *Airworthiness Certification of Aircraft and Related Products*
- Order 8310.6, *Airworthiness Compliance Check Sheet Handbook*
- Order 8900.1, *Flight Standards Information Management System (FSIMS)*
- AC 20-77, *Use of Manufacturers' Maintenance Manuals*
- AC 20-114, *Manufacturers' Service Documents*
- AC 20-138, *Airworthiness Approval of Positioning and Navigation Systems*
- AC 20-177, *Design and Installation Guidance for an Airborne System for Non-Required Telecommunication Service in Non Aeronautical Frequency Bands*
- AC 21-40, *Guide for Obtaining a Supplemental Type Certificate*
- AC 21-45, *Commercial Parts*
- AC 21-47, *Submittal of Data to an ACO, a DER or an ODA for a Major Repair or a Major Alteration*
- AC 23-8, Appendix 5, *Guide for Preparing Airplane Flight Manual and Pilot Operating Handbook Supplement*
- AC 23-17, *Systems and Equipment Guide for Certification of Part 23 Airplanes and Airships*
- AC 23-21, *Airworthiness Compliance Checklists Used to Substantiate Major Alterations for Small Airplanes*
- AC 23.1309-1, *System Safety Analysis and Assessment for Part 23 Airplanes*
- AC 25-15, *Approval of Flight Management Systems in Transport Category Airplanes*
- AC 25.1309-1, *System Design and Analysis*
- AC 25.1581-1 *Airplane Flight Manual*
- AC 27-1, *Certification of Normal Category Rotorcraft*
- AC 29-2, *Certification of Transport Category Rotorcraft*
- AC 33.4-1, *Instructions for Continued Airworthiness*
- AC 43-9, *Maintenance Records*
- AC 43.9-1, *Instructions for Completion of FAA Form 337*
- AC 43-210, *Standardized Procedures for Requesting Field Approval of Data, Major Alterations, and Repairs*

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- AC 43.13-1, *Acceptable Methods, Techniques, and Practices—Aircraft Inspection and Repair*
- AC 43.13-2, *Acceptable Methods, Techniques, and Practices—Aircraft Alterations*
- AC 60-6, *Airplane Flight Manuals (AFM), Approved Manual Materials, Markings and Placards - Airplanes*
- AC 120-77, *Maintenance and Alteration Data*
- Aeronautics Bulletins 7, 7-A, 7-F, and 7-G, *Air Commerce Regulations*
- Aeronautics Bulletin 7-H, *Air Commerce Regulations Alterations and Repair of Aircraft*
- Aeronautics Bulletin 8, *Airway Map of the United States*
- TCDS applicable to the product
- Air Transportation Oversight System (ATOS) Element: 1.2.2 Major Repairs and Alterations Records

2. Forms.

- FAA Form 337, *Major Repair and Alteration*
- FAA Form 8110-3, *Statement of Compliance with the Federal Aviation Regulations*
- FAA Form 8100-9, *Statement of Compliance with Airworthiness Standards*
- FAA Form 8110-12, *Application for Type Certificate, Production Certificate, or Supplemental Type Certificate*

3. Job Aids.

- Major Repair and Alteration Data Approval Job Aid

4. Commercial and military standards. All referenced commercial and military standards are available on their corresponding web sites.

- Military standards, ASSIST Quick Search
- ARINC standards, ARINC Store Products
- ASTM standards, ASTM International Standards
- RTCA standards, RTCA Products
- SAE standards (ARP), SAE Aerospace Standards
- Institute of Electrical and Electronics Engineers (IEEE) standards, IEEE Standards

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What is a DER?

- ✓ A **DER** [Designated Engineering Representative] is an individual who **meets the requirements of 14 CFR Part 183 and Order 8100.8.**
- ✓ The **DER designation** covers discipline specialties as defined in **Orders 8100.8 and 8110.37.**
- ✓ These delegations are defined by charts:

10 Areas

Chart A, DER Structural .....
Chart B, DER Powerplant Installations.....
Chart C1, DER Systems and Equipment.....
Chart C2, DER Systems and Equipment (Electrical Equipment)
Chart D, DER Radio.....
Chart E, DER Engines.....
Chart F, DER Propellers.....
Chart G, DER Flight Analyst .....
Chart H, DER Flight Test Pilot .....
Chart I, DER Acoustical.....

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Delegated Disciplines

(1) Structural engineering,

(2) Powerplant engineering,

(3) Systems and equipment engineering,

(4) Radio engineering,

(5) Engine engineering,

(6) Propeller engineering,

(7) Flight analyst,

(8) Flight test pilot, and

(9) Acoustical engineering.

C1 & C2

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DER CHART A

2-5. DER Designations.

a. Structural DERs may approve, within the limits of their appointment, the following items that comply with pertinent regulation(s):

(1) Engineering reports,

(2) Drawings,

(3) Material and process specifications used in structural applications, and

(4) Other data relating to structural considerations.

Let's look at the chart A layout

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Appendix B. Delegated Functions and Authorized Areas

Figure 1. Chart A, DER Structural

Functions and areas that *can* be authorized are defined by *white squares*. Each DER's authority may be different, and is identified in their letter of appointment.

	AUTHORIZED AREAS	Structural-General (1)	Structural-Wing Group	Structural-Fuselage Group	Structural-Empennage Group	Structural-Landing Gear	Structural-Flight Controls	Structural-Rotor	Loading Control Documents	Metallic Materials (2)	Nonmetallic Materials (3)	Interior Arrangements	Interior Materials	Fire Protection	Evacuation Systems	Ditch Systems	Special (Specialty)
	DELEGATED FUNCTIONS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	STATIC ANALYSIS		■	■	■		■		■	■	■	■	■	■	■	■	
2	DYNAMIC ANALYSIS		■	■	■		■		■	■	■	■	■	■	■	■	
3	FATIGUE ANALYSIS						■		■	■	■	■	■	■	■	■	
4	DESIGN AND CONSTRUCTION											■	■	■	■	■	
5	FLUTTER/GROUND VIBRATION		■	■	■	■	■		■	■	■	■	■	■	■	■	
6	SAFETY ANALYSIS		■	■	■			■	■	■	■	■	■				
7	FLOTATION & DITCHING ANALYSIS		■	■	■	■	■	■	■	■	■	■	■	■	■	■	
8	STRUCTURAL LOADING LIMITATIONS	■	■	■	■	■	■	■		■	■	■	■	■	■	■	
9	SERVICE DOCUMENTS								■								
10	MATERIAL & PROCESS SPEC	■	■	■	■	■	■	■	■			■	■	■	■	■	
11	FLAMMABILITY	■	■	■	■	■	■	■	■	■	■	■			■	■	
12	DAMAGE TOLERANCE EVALUATIONS		■	■	■	■	■		■	■	■	■	■	■	■	■	

Note (1): Includes all airframe components: wing, fuselage, empennage, landing gear, flight controls, engine mounts, and special components. Does not apply to rotors.

Notes (2) and (3): Select Specialty by Note number and sub-letter from lists below. General applies to all processes listed.

(2) Metallic Materials/Processes
- A - Materials & Processes - General
- B - Non-Destructive Inspection/Testing
- C - Metallurgy
- D - Metal Joining Processes
- E - Structural Adhesives
- F - Mechanical Fasteners
- G - Surface Treatment/Coatings
- H - Bearings

(3) Nonmetallic Materials/Processes
- A - Material & Processes - General
- B - Transparent (Glazed) Material
- C - Polymeric Materials
- D - Structural Adhesives
- E - Mechanical Fasteners
- F - Composites
- G - Non-Destructive Inspection/Testing
- H - Surface Treatment & Coatings
- I - Structural Joining Methods

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Figure 2. Chart B, DER Powerplant Installations

Functions and areas that *can* be authorized are defined by *white squares*. Each DER's authority may be different, and is identified in their letter of appointment.

	AUTHORIZED AREAS	Airplane Turbine Engine	Airplane Piston Engine	Rotorcraft Turbine Engine	Rotorcraft Piston Engine	Auxiliary Power Unit (APU)	Special (Specify)
	DELEGATED FUNCTIONS	A	B	C	D	E	F
1	ENGINE INSTALLATION						
2	FUEL & OIL						
3	INDUCTION/EXHAUST SYSTEMS						
4	THRUST REVERSERS						
5	FIRE PROTECTION						
6	ICE PROTECTION						
7	COOLING						
8	ENGINE PERFORMANCE/OPERATIONS						
9	INDICATING SYSTEMS						
10	LIGHTNING/HIRF PROTECTION						
11	SOFTWARE						
12	CONTROL SYSTEM - ELECTRONIC						
13	CONTROL SYSTEM - MECHANICAL						
14	EMISSIONS						
15	VIBRATION – ENGINE, PROPELLER, OR DRIVE SYSTEM						
16	PROPELLER						
17	DRIVE SYSTEM						
18	TRANSMISSIONS						
19	SAFETY ANALYSIS						
20	SERVICE DOCUMENTS						

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Figure 3. Chart C1, DER Systems and Equipment (Mechanical Equipment)

Functions and areas that *can* be authorized are defined by *white squares*. Each DER's authority may be different, and is identified in their letter of appointment.

	AUTHORIZED AREAS	Air Conditioning	Hydraulic	Ice Protection	Rain Protection	Oxygen	Pneumatics	Wheels, Tires, and Brakes	Interior Arrangements	Exterior Materials	Pressurization	Fire Protection	Water System, Potable and Waste	Evacuation Systems	Special (Specify)
	DELEGATED FUNCTIONS	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	DETAIL DESIGN AND INSTALLATION														
2	EQUIPMENT QUALIFICATION TESTS														
3	SOFTWARE														
4	SAFETY ANALYSIS														
5	FLAMMABILITY														
6	LIGHTNING/HIRF PROTECTION														
7	SERVICE DOCUMENTS														

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Figure 4. Chart C2, DER Systems and Equipment (Electrical Equipment)

Functions and areas that *can* be authorized are defined by *white squares*. Each DER's authority may be different, and is identified in their letter of appointment.

	DELEGATED FUNCTIONS	AUTHORIZED AREAS: Electrical Equipment/Systems (A)	Electronic Equipment/Systems (B)	Communications Systems/Antennas (C)	Automatic Flight Controls/Augmentation (D)	Instruments (E)	Navigation Systems/Antennas (F)	Air Data/Pitot Static (G)	Warning Systems (H)	Interior/Exterior Lighting (I)	Flight Data/Voice Recording (J)	Passenger Address/Entertainment (K)	Special (Specify) (L)
1	DETAIL DESIGN AND INSTALLATION												
2	EQUIPMENT QUALIFICATION TESTS												
3	SOFTWARE												
4	SERVICE DOCUMENTS												
5	ELECTRICAL LOAD ANALYSIS												
6	SAFETY ANALYSIS												
7	LIGHTNING/HIRF PROTECTION												

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Figure 6. Chart E, DER Engines

Functions and areas that *can* be authorized are defined by *white squares*. Each DER's authority may be different, and is identified in their letter of appointment.

	DELEGATED FUNCTIONS	AUTHORIZED AREAS: Turbine Engines (A)	Piston Engines (B)	Special (Specify) (C)
1	DETAIL DESIGN			
2	BLOCK TESTS			
3	PERFORMANCE CHARACTERISTICS			
4	VIBRATION ANALYSIS			
5	OPERATION MANUALS			
6	OVERHAUL MANUALS			
7	SERVICE DOCUMENTS			
8	EXHAUST EMISSIONS EVALUATION			
9	SOFTWARE			
10	SAFETY ANALYSIS			
11	LIGHTNING/HIRF PROTECTION			

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What is a DER? [con't]

- ✓ DERs can also be granted additional special delegations that are identified in Order 8110.37 [DER Handbook]. These special delegations are not part of the DER basic authority areas. These are:
  - Approval of Service Documents
  - DER International Operating Procedures
  - PMA Identicality Procedures
  - Repairs and Alterations
  - Repair Specifications (RS)
  - Flammability Testing of Interior Materials

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Which FAA branch appoints DERs?

- The Aircraft Certification Office which has primary responsibility for engineering and design aspects of any airworthiness data.
- Additional shared responsibilities with Organizational Designees [A/Rs] are shared with the FAA MIDO [new ODA-TC/PMA designs] and with the FAA FSDO [ODA-M/R].

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What Does a DER Do?

- ✓ **D**esignated **E**ngineering **R**epresentative (& **RS-DER**) of the FAA ACO **approves Repairs, Alterations, and other data.**
- ✓ **Alternate Means of Compliance**(AMOC) Ref 14 CFR Part 39
- ✓ **Evaluates repair design data** against the same FAA regulations used to issue the aircraft TC (i.e. Part 23, 25)
- ✓ **Issues FAA Form 8110-3** defining applicability, limitations, and ICA for the repair.
- ✓ **Executes** a **Repair to FAA-Approved Data** [ACO/DER] under the oversight of the cognizant FSDO of the applicant.

The Modification must be as good as or better than the TC design!
[14 CFR 1.1]

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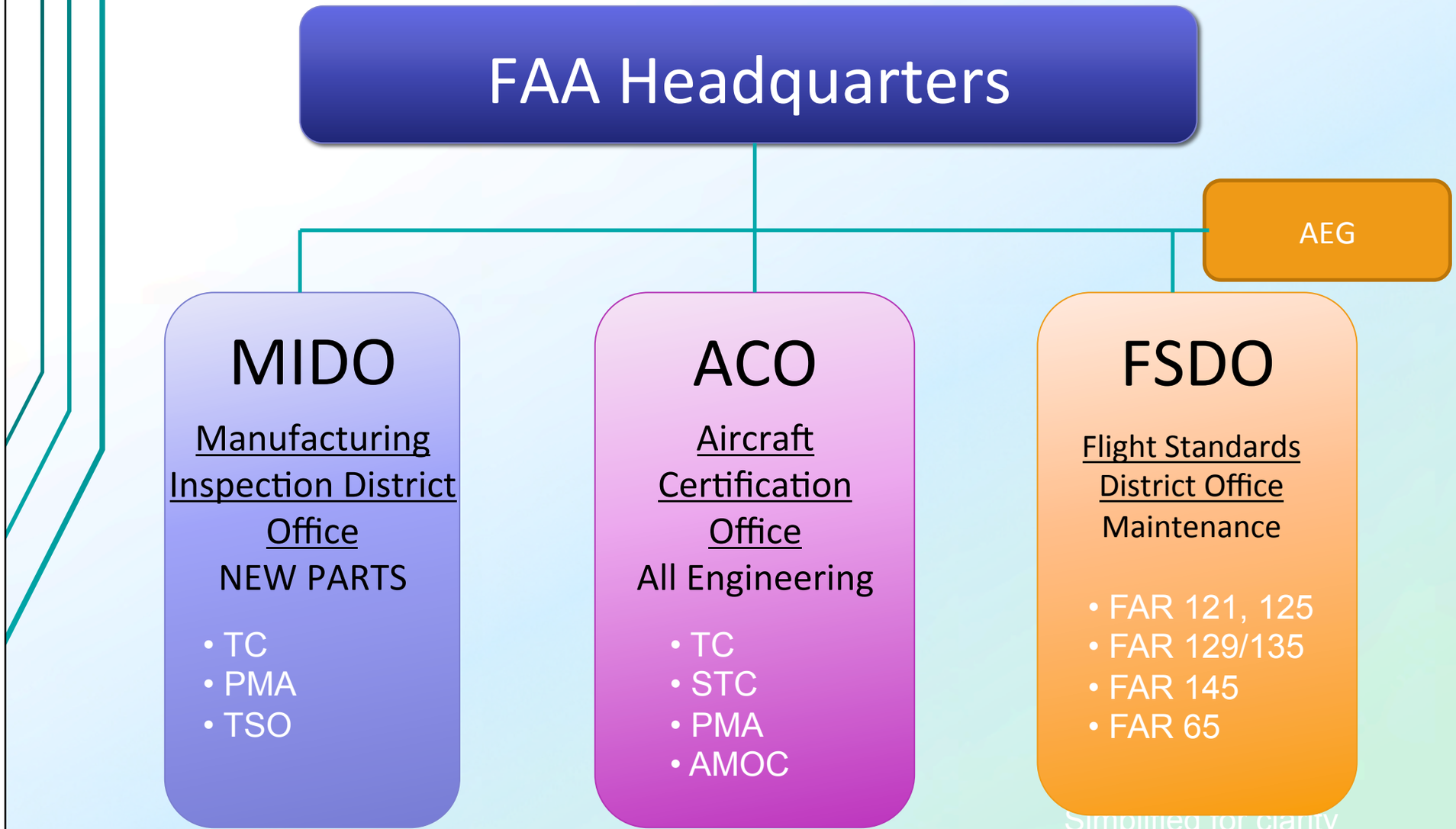
FAA Organizational Structure



Simplified for clarity

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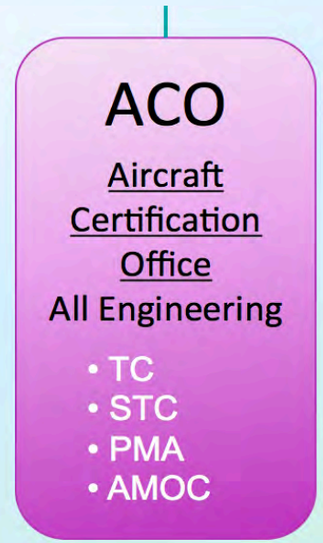
FAA ACO

ALL Engineering Aspects

- Design Approvals for all 14 CFR Part 21 Products/Articles
  - TC /Amended TC
  - STC
  - PMA
  - TSO
  - Repairs /Alterations

Designee & Organizational Oversight

- DERT, DERY, RS-DER
- ODA /TC/STC/TSO/PMA & MR



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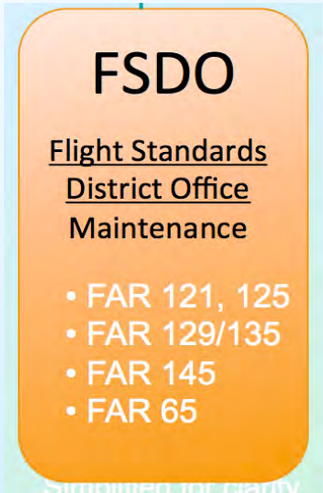
FAA FSDO

Maintenance Aspects

- Repairs
- Alterations
- Rebuilds
- Overhauls



Airworthiness Rules

- FAR 65 – Repairmen/Mechanics/Inspection Authorization
- FAR 43 – Performance Rules
- FAR 145 – Repair Stations / ODA MR
- FAR 121, 125, 129, 135 operators
- ODA MR Oversight & DART Designees

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FAA MIDO

New Manufacturing & Conformity Inspections Aspects

- Oversight of Production Approval Holders [PAH]
  - TC Holders
  - PC Holders
  - PMA PAH
  - TSO PAH

Oversight & Designees

- ODA TC/PC/PMA/TSO, & DARF/DMIR

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Aircraft Evaluation Group
AEG

- Primary Responsibilities is to review applicants ICA's {AWL's, AMM, ESM, SB, SRM, and other instructions. The AEG can accept or approve the applicants ICA's.
- Only when a NEW or Supplemental ICA is issued.

AEG

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Basic Regulatory Framework

New Aircraft TC

- ACO approves design data showing compliance to FAA requirements (i.e., Part 21, and 23, or 25, 27, 29 etc)

Aircraft Production System

- MIDO approves the Fabrication Inspection System to ensure manufacturing compliance to approved design data

Continued Air-worthiness

- FSDO ensures Instructions for Continued Airworthiness (ICA) are properly implemented and executed (e.g., SRM's; , SB, AMM, ESM, CMM's)

Alternate Means of Compliance 14 CFR Part 39 (AMOC) can be used, BUT, must meet the FAA mandated AD requirements or show ELOS.

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FAA Delegation & Oversight Summary

Areas	MIDO	ACO	FSDO	AEG
DER Approvals	X	X	X	*
TC/OEM Repairs		X	X	X
PMA/TSO/TC Parts	X	X		X*
PAH Alterations		X	X	*
New AWL		X	X	X

- Repairs, whether OEM or DER Approved, are dictated by the same regulations & branches of the FAA [ACO/FSDO/AEG]
- New Spares, whether OEM or PMA, are dictated by the same regulations & branches of the FAA [ACO/ MIDO/AEG]

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Why are DER Repairs of Interest?

- Improved part availability
- Lower Part Replacement cost
- Using service experience, design improvements can be implemented to improve part performance (e.g., reliability, weight reduction)
- On Wing Service is extended

Avoid scrapping hard to replace and/or expensive parts

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EXAMPLES OF REPAIR & ALTERATIONS

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DER Repair – V2500 Ducting

Engine Anti-Ice & Starter Ducts

- Typical defects:
  - Chafing, Dents, Cracking
- Problem:
  - CMM has limited repairs
  - Ducts are $25K-$90K to replace and have long lead times
- Solution:
  - FAA DER Approved Repair

Courtesy Exotic Metals

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Duct DER Approval Process

Create Repair Plan

- Section replacement
- Dent removal
- Weld repair

Identify Applicable Part Design Chapters

- 25.301 [Loads]; 25.303 [Factor of Safety]; 25.305 [Strength]; 25.307 [Structure] and others…

Substantiate Proposed Repair

- Stress Analysis
- Weld samples & Elongation Testing
- Comparative Analyses
- Inspection criteria (weld x-ray)

Need for Supplemental ICA/AWL?

- Use existing CMM

Submitted to FAA (DER & RS-DER)

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FAA Approved Data

8110-3 Form

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

STATEMENT OF COMPLIANCE WITH AIRWORTHINESS STANDARDS

DATE: **May 23, 2013**

AIRCRAFT OR AIRCRAFT COMPONENT IDENTIFICATION

MAKE	MODEL NO.	TYPE *(Airplane, Radio, Helicopter, etc.)*	NAME OF APPLICANT
Hamilton Sundstrand	**769150, 775635, 782630**	**Air Cycle Machine**	**ACME, Anyplace USA**

LIST OF DATA

IDENTIFICATION	TITLE
DER 765409-2 Dated May 21, 2013 Rev. IR ***END***	**Repair of an O-Ring Face Seal Hamilton Sundstrand P/N 765409-2 [PMA Equivalent P/N 1-676-600]** ****END DATA**** **What the DER is approving:** The technical aspects of a multiple use repair design to be used as a "repetitive repair" for the same discontinuity level described in the repair specification associated with this technical data. The repair specification must be accomplished and approved on a N8110-111 form. ****END DATA**** **Note[1]:** This approval is for engineering design data only. It indicates the data listed above demonstrates compliance only with the regulations specified by paragraph and sub paragraph listed below as "Applicable Requirements." This form constitutes FAA approval of all the technical engineering data necessary for substantiation of compliance to necessary requirements for the entire repair. Additional and separate approval is required for repair process by a RS-DER. Installation approval is to be obtained from the cognizant FSDO or your local CAA, and is the responsibility of the installer to secure installation approval, as defined by 43.7, and Order 8110.37E and N8110.111

APPLICABLE REQUIREMENTS ***(List specific sections)***
25.1 [Applicability], 25.301[Loads], 25.303 [Factor of safety], 25.305 [Strength and deformation], 25.307 [Proof of structure], 25.603[Materials], 25.605[Fabrication methods], 25.607[Fasteners], 25.609[Protection], 25.611[Access], 25.613 [Material strength properties and design], 25.901 [Installation-Powerplant], 25.1091[Air Induction], 25.1301[Equipment & Systems], 25.1309(a)[Equipt & Install] .

PURPOSE OF DATA

In support of a Major Repair Multiple Use Repair Fixed wing only * This approval requires additional review and approval by RS-DER per N8110.111, and 8110.37E.

APPLICABLE REQUIREMENTS ***(List specific sections)***
14 CFR Part(s): 25.603 [Materials, Amdt. 25-46], 25.605 [Fab methods, Amdt. 25-46], 25.609 [Protection of structure, Orig Amdt.], 25.611 [Accessibility provisions, Amdt. 25-123], 25.613 [Material strength properties and design, Amdt. 25-112], 25.1301 [Function and Installation, Amdt. 25-123], and 25.1309 [Equipment, systems, and installations, Amdt. 25-123].

CERTIFICATION - Under authority vested by direction of the Administrator and in accordance with conditions and limitations of appointment under Part 183 of the Federal Aviation Regulations, data listed above and on attached sheets numbered. _NONE_ have been examined in accordance with established procedures and found to comply with applicable requirements of the Federal Aviation Regulations.

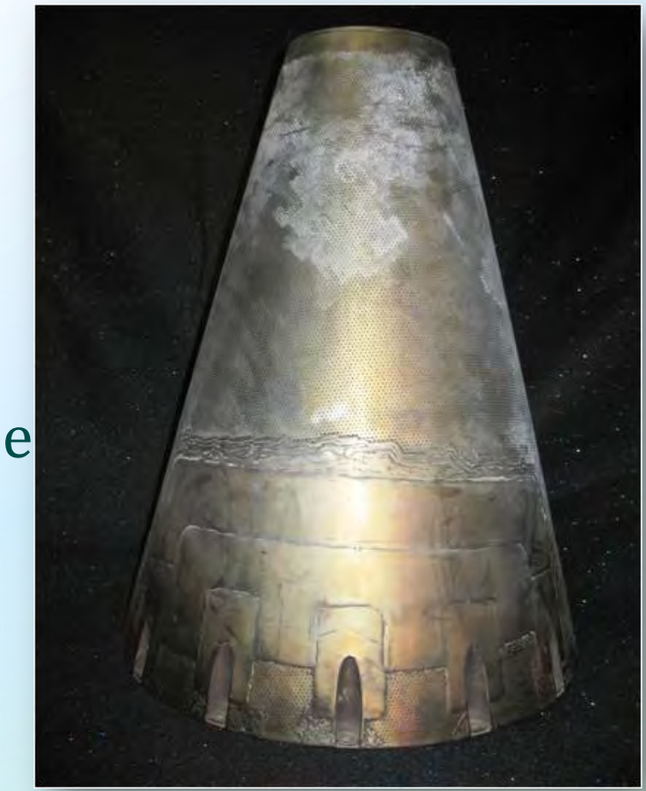
I(~~We~~) Therefore
- ☐ **Recommend approval of these data***
- ☒ **Approve these data****

The repair is now approved and shown to be as good as or better than the original TC product

DER Repair

V2500/A5 Engine Exhaust Cone

- Typical defects:
  - ✓ Cracking in perforated outer skin
- Problem:
  - ✓ CMM has limited repairs
  - ✓ Cracking re-occurs after short time in service
  - ✓ Cones are >$100K to replace
- Solution:
  - ✓ FAA DER Approved Repair



Courtesy Exotic Metals

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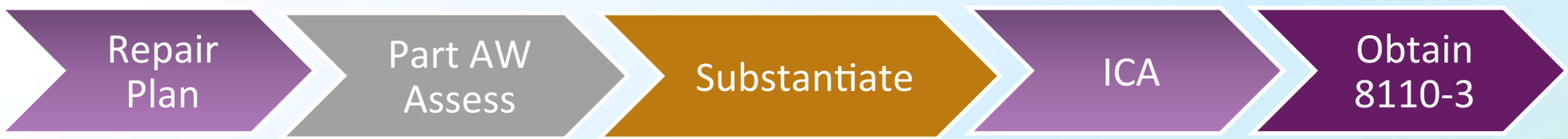
DER Approval Process

Essentially the same as for the duct example



- In this case design improvements were made to address service difficulties (frequent removals due to cracking)

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V2500 Exhaust Cone Repair

Primary cracking source eliminated–improved durability

Weight savings of 1.5lbs per engine

40 to 80% reduction in repair or replacement cost

Lead time cut by > 50%

Courtesy Exotic Metals

Great example of how a DER repair can not only reduce repair cost and TAT, but also improve the product performance!

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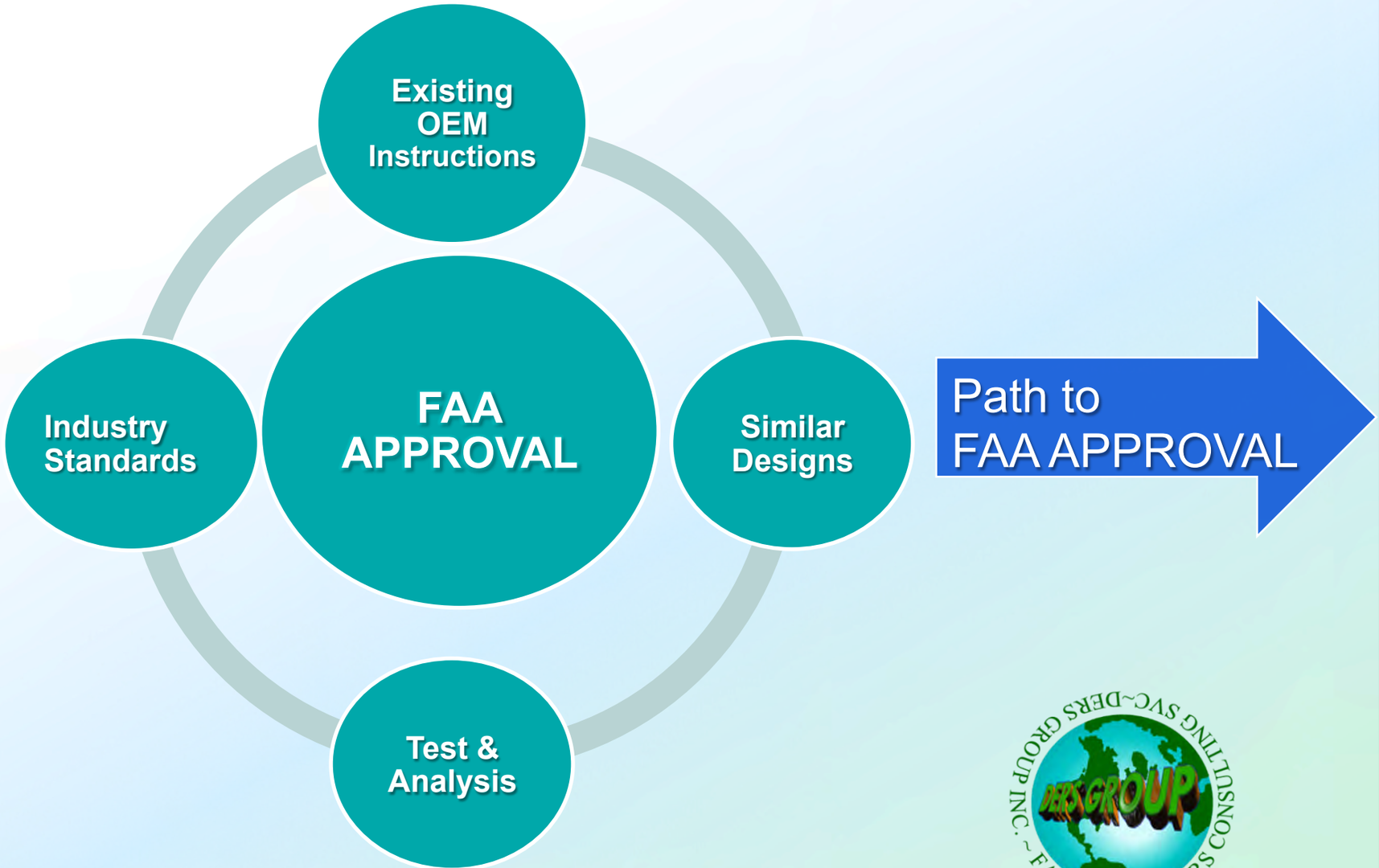
DEVELOPING A NON-BOOK REPAIR



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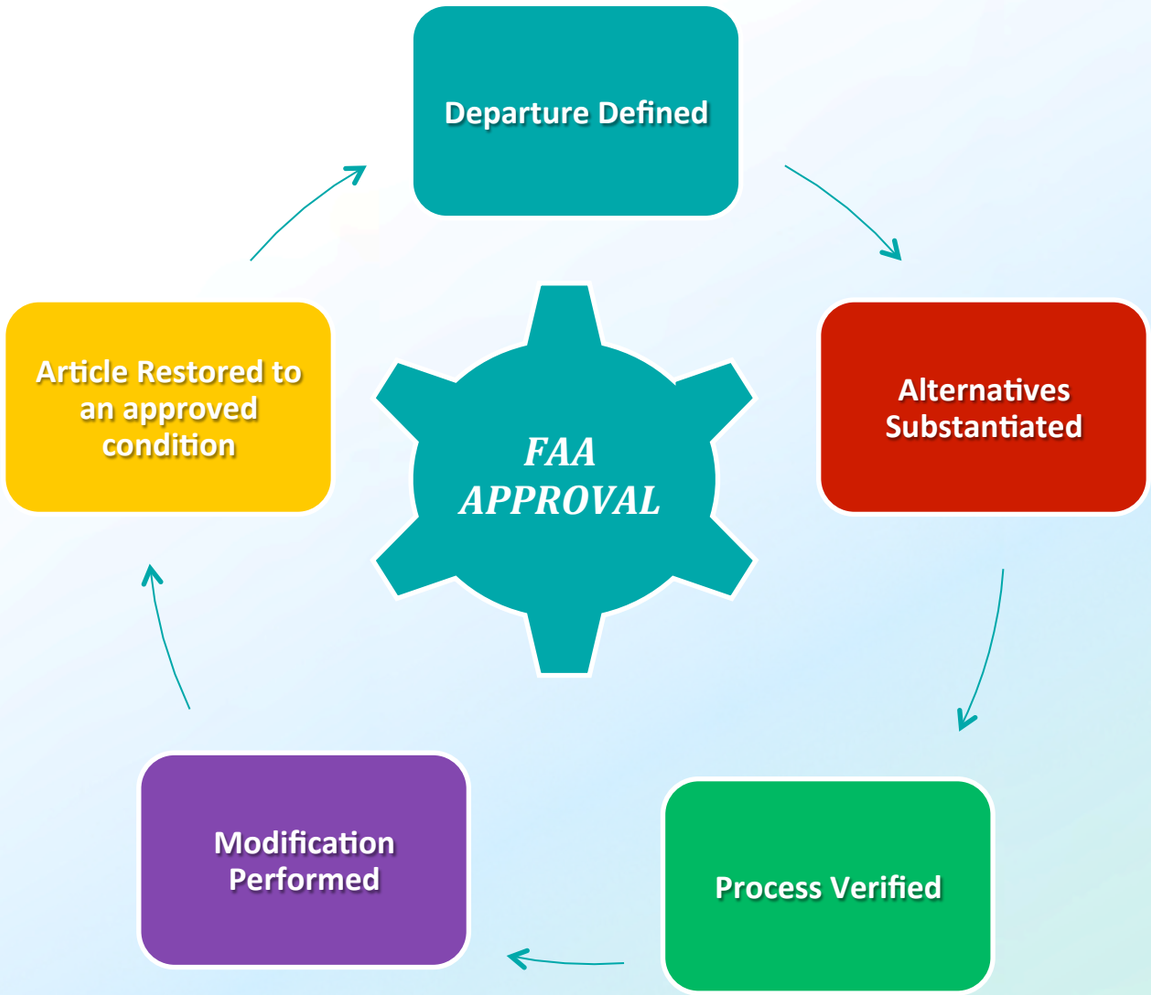
Modification Process Flow



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Start developing a NON-BOOK REPAIR

– An Example

Our Situation:

"We have a combustor on which we've used existing ESM repair procedure ATA 72-31-12 011 [Repair 011 "Weld cracked cooling holes, blend, re-drill, FPI, re-flow, Pass/Fail.] Limits are: no adjacent holes can have more than ten (10) connections without one hole interruption that ends the linkage of the crack. You may have up to 210 degrees around one (1) fuel nozzle of total repaired crack length. You may have up to thirteen (13) of twenty six (26) repaired nozzles. Air flow must be met after all holes are repaired and re-drilled per airflow standard AFS13542-01.

Repeated attempts of this repair have proven unsuccessful and warranty claims by end user and TAT are negative."

Now, What shall we do?

A. OEM has been notified and they have no adequate response.
B. Develop a DER repair alternative.

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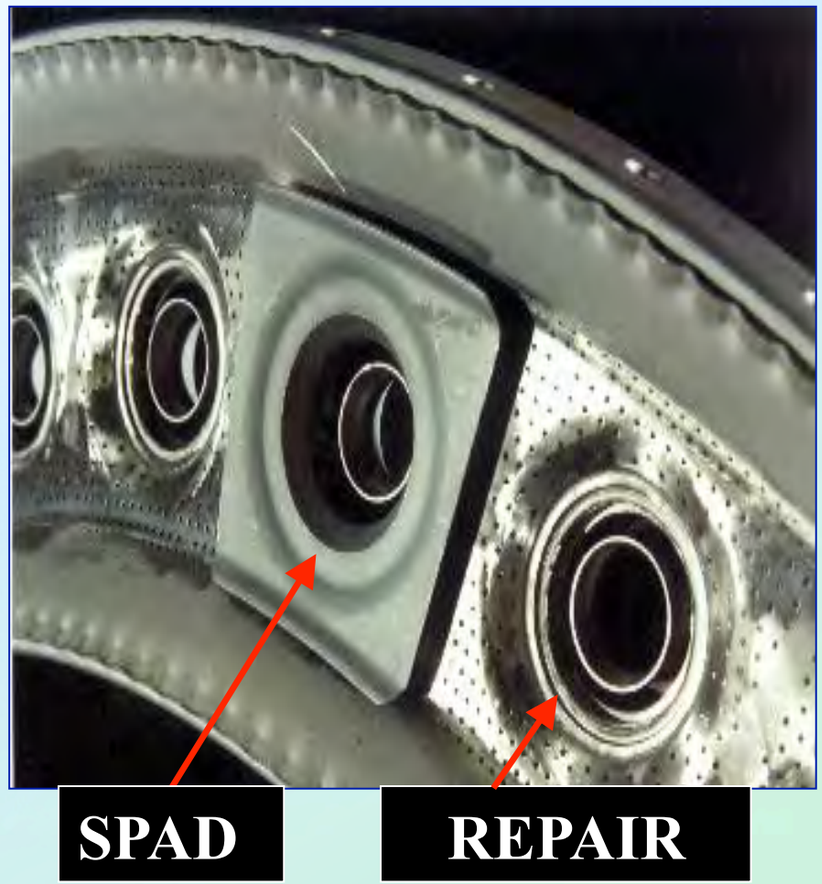
Example of a DER Alternative Repair with a Locally Mfg Part – Non-Book Repair

1. A Nozzle SPAD is locally produced, by the repair facility.
2. The damaged area is cut out
3. The new SPAD is welded in place
4. The SPAD & weld is blended
5. The weld repair is NDT Inspected
6. The new SPAD is laser drilled for air cooling holes.
7. The Combustor dome is air flowed and re-inspected to OEM Stds.
8. Repair data is FAA DER approved, in accordance to AC 43-18 Chg. 2

A Non-book repair of a Combustor



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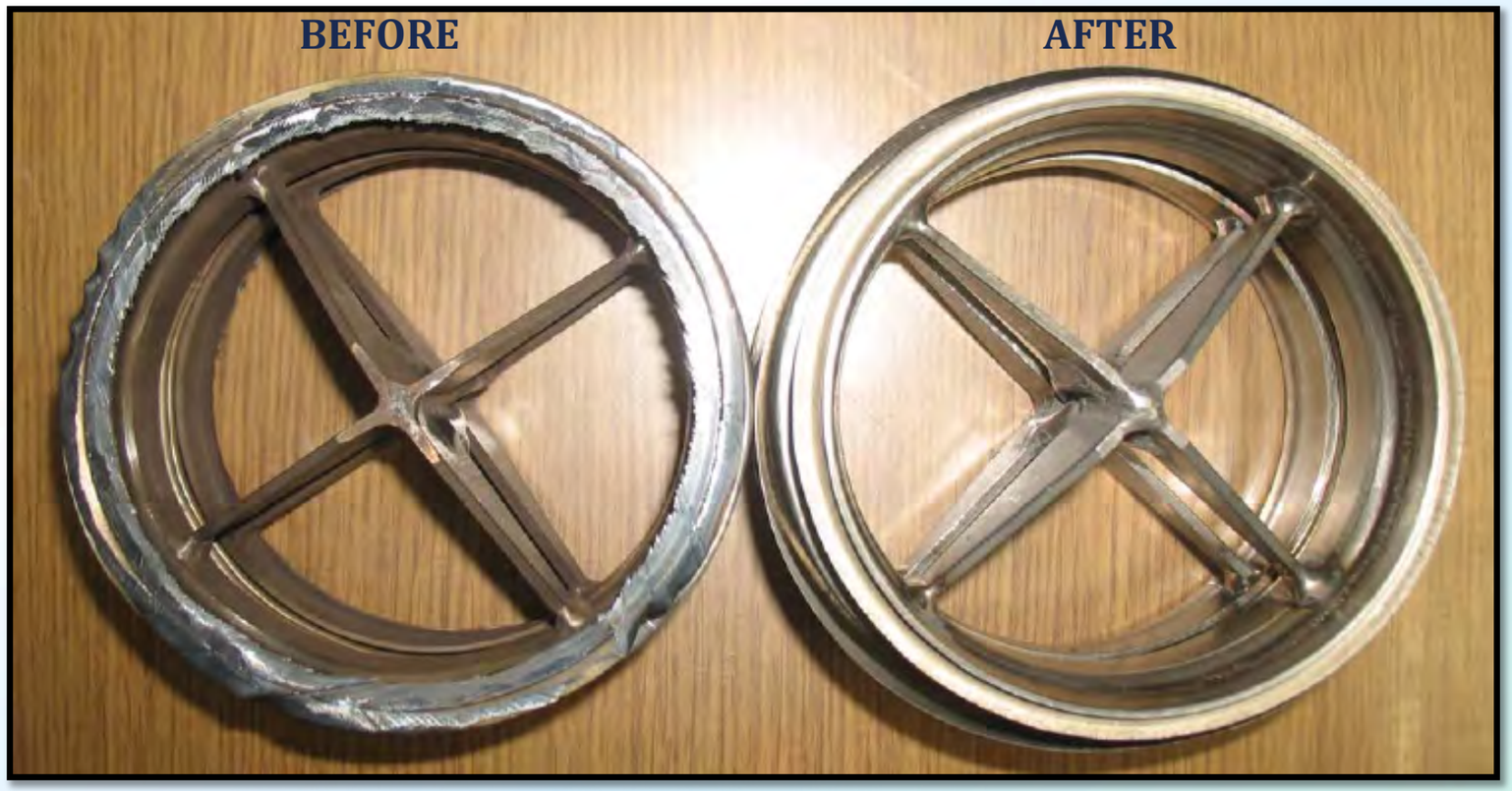
NON-Book DER Repairs - *Continued*



Flange Replacement & Guide Fin
Replacement APU exist vent duct

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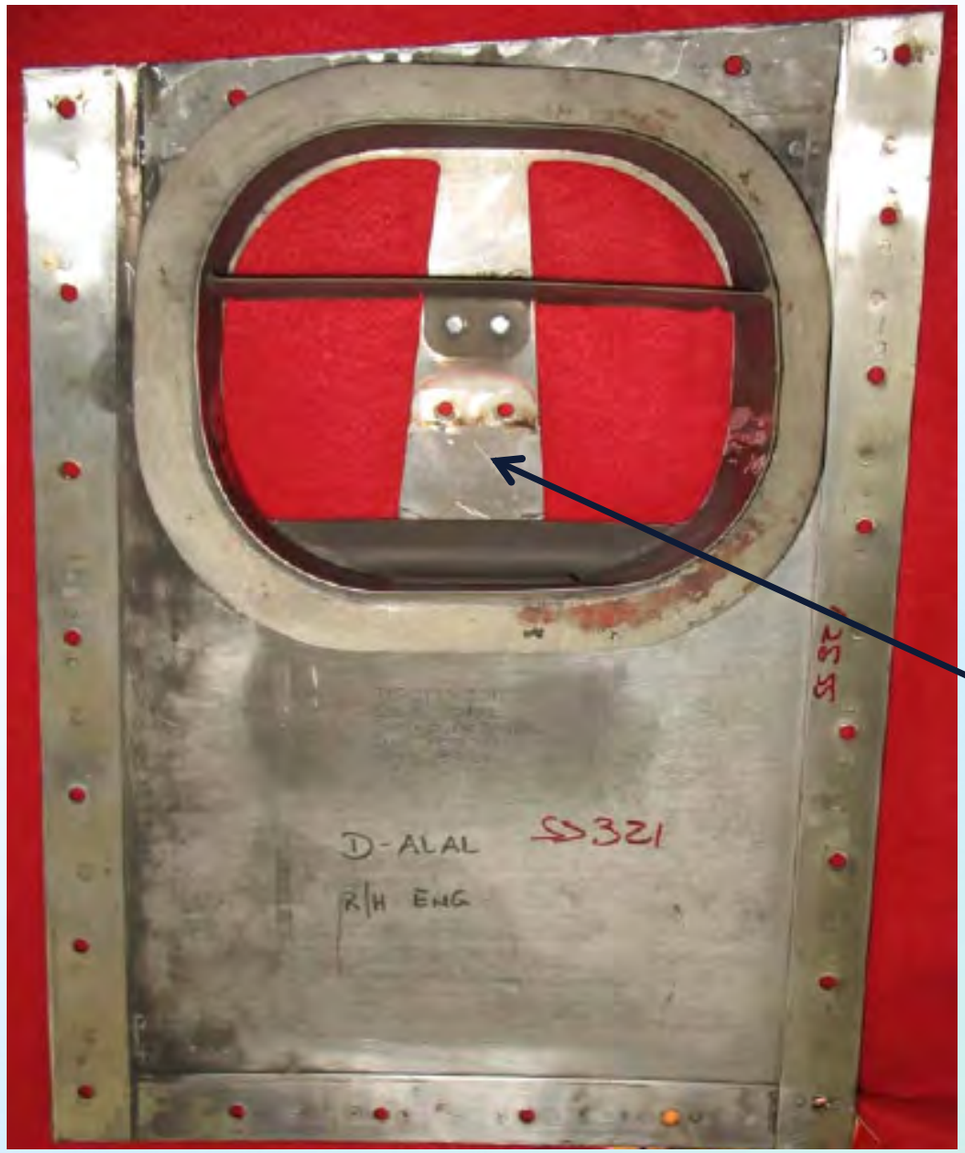
Fab by Maintenance



Missing Spar

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What Rules Apply to MRPs?

Much depends on WHO is accomplishing the Modification Replacement Part tasks!

- **Repair Stations**:

14 CFR Part(s): 43.13, CFR Part(s): 21.8, 21.9 and the specific product design rules [i.e. Part 25, Part 33 etc.]

Order(s) 8110.4C, 8110.42D, 8110.37E, 8900.1, 8100.13, 8300.16, and 8110.54.

AC 43–18 Chg. 2, AC 33.8, AC 33 -9 Repair, AC 23.1309-1C, AC 25.1309-1B, AC 25.571, AC 33.75-1, AC 20-62E, AC21-47, & AC 120-77.

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What is the Status of DER Acceptance in EASA Member states?

FAA and EASA Reciprocal Acceptance of Repair Data within the United States and European Union

Presented to: Workshop on the Implementation of Annex 2 (Maintenance) to the Agreement between USA and EU

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FAA & EASA RECIPROCAL AGREEMENT

- The FAA and EASA have agreed to reciprocal acceptance of repair data.
  - Implemented through the new US/EU Aviation Safety Agreement, effective May 1, 2011
    - Annex 1, paragraph 3.2.7
    - Technical Implementation Procedures, paragraph 3.3
  - Implemented prior to May 2011 through Bilateral Aviation Safety Agreements Implementation Procedures for Airworthiness with 6 EU member states.

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TECHNICAL IMPLEMENTATION PROCEDURES

FOR

AIRWORTHINESS AND ENVIRONMENTAL

CERTIFICATION

BETWEEN THE

FEDERAL AVIATION ADMINISTRATION
OF THE
UNITED STATES OF AMERICA

AND THE

EUROPEAN AVIATION SAFETY AGENCY
OF THE
EUROPEAN Union

Revision 5
September 15, 2015

REPAIR ACCEPTANCE BY EASA & FAA

- **FAA and EASA will accept each others approved repair design data regardless of State of Design of the component/product.**

Two processes established:

- Streamlined Reciprocal Acceptance of repair data for non-critical components and critical components developed by the TC/STC holder
- Formal approval of critical component repair data developed by a third party

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Process 1: Streamlined acceptance of repair data

US to EUROPE:

- **EASA has certificated/validated the product or appliance, i.e. the product has an EASA TC/STC or ETSO approval.**
- **FAA is the authority of the State of Design for the repair design data.**
- **Data approved using the FAA system, major repair data approval via an FAA letter, FAA Form 8110-3, 8100-9 or 337**

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Process 1: Streamlined acceptance of repair data (continued)

EUROPE to US:

- **FAA has certificated/validated the product, part, appliance or component (i.e. the product has an FAA TC/STC or TSO approval).**
- **EASA is acting on behalf of the State of Design for the repair design data.**

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Process 1: Streamlined acceptance of repair data (continued)

EUROPE to US continued:

- **EASA repair design data approval is substantiated via an EASA repair design approval letter or a repair design approval issued under a Design Organisation Approval (DOA), and**
- **The repair is not in an area that is subject to an FAA AD, unless the AD allows for acceptance of an EASA repair design approval**

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Acceptance of repair data

FAA and EASA have agreed to accept each other's systems for the classification and approval of repair data.

- **Data must have a local approval.**
  - **FAA approval for repairs designed in the US system;**
  - **EASA approval for repairs designed in the EU system**

Remember, FAA or EASA must approve/accept the repair design data under its own system before the other bilateral partner can accept it.

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Process 2: CRITICAL COMPONENTS

Formal Approval of Critical Component Repair Data (by other than the TC/STC holder)

- **Make application through FAA/EASA:**
  - **Fast track process when the FAA or EASA can confirm that the applicant has entered into an arrangement with the TC/STC holder for this data.**
  - **Validation process is required when there is no arrangement with the TC/STC holder.**
  - **FAA or EASA will issue its own approval of the critical component repair.**

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EASA & FAA AGREEMENT SUMMARY

- FAA and EASA will accept each others approved repair design data regardless of State of Design of the component/product.
- Critical components will require additional review.

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MAINTENANCE ANNEX GUIDANCE

BETWEEN THE

FEDERAL AVIATION ADMINISTRATION

for the UNITED STATES OF AMERICA

AND THE

EUROPEAN AVIATION SAFETY AGENCY

for the EUROPEAN UNION

Effect On Repairs

Version #	Date	Revision Description	Prepared By
Change 6	06/01/2016	Updated to include technical and editorial changes (identified by change bars on the left margin). Significant changes include the following: • Changed oversight system to Safety Assurance System. • Redefined coordinator roles regarding the IFO position. • Updated office AFS symbols. • Corrected repair station/AMO references. • Re-write of Section B (paragraph 10) and Section C (paragraph 7). • Changed references to (EU) 3121/2014. • Updated Section C to reflect switch to e-mail process for OpSpecs.	Daniel Reyes

MAG 6 [Cont.]

MAG-6
Changes from MAG-5

Version #	Date	Revision Description	Prepared By
Change 6	06/01/2016	Updated to include technical and editorial changes (identified by change bars on the left margin). Significant changes include the following: • Changed oversight system to Safety Assurance System. • Redefined coordinator roles regarding the IFO position. • Updated office AFS symbols. • Corrected repair station/AMO references. • Re-write of Section B (paragraph 10) and Section C (paragraph 7). • Changed references to (EU) 3121/2014. • Updated Section C to reflect switch to e-mail process for OpSpecs.	Daniel Reyes

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c) **Acceptability of Component.** Describe procedures regarding the acceptability of components authorized for use during maintenance, which should comply with the following requirement. Only the following new and used serviceable components may be fitted during maintenance.

(1) New Components

(a) New components must be traceable to the Production Approval Holder (PAH) and be in a satisfactory condition for installation. An authorized release document, as detailed below, must accompany the new component.

i) For new components released by a U.S.-PAH, release must be documented on FAA Form 8130-3 as a new part.

NOTE: New parts that were received into inventory prior to October 1, 2016, at a minimum, have a document or statement (containing the same technical information as an FAA Form 8130-3) issued by the PAH or supplier with direct ship authority. Parts currently in inventory, documented with the required information, will be grandfathered and remain suitable for installation, provided the certification/release date on these parts is prior to October 1, 2016.

ii) For new components released by an EU-PAH, release must be on an EASA Form 1 as a new part.

iii) For new components released by a Canadian PAH, release must be on the Transport Canada Civil Aviation (TCCA) Canadian Form One as a new part.

iv) Parts fabricated by an appropriately rated, EASA-approved Part-145 AMO in accordance with EASA Part145.A.42, are not subject to the foregoing provisions.

v) Standard parts meeting the requirements of 14 CFR part 21, section 21.9(a)(3), (such as a nut or bolt, manufactured in compliance with a government or established industry specification) are not subject to the forgoing provisions, provided such parts are accompanied by a conformity statement and be in a satisfactory condition for installation.

vi) PMA parts may only be accepted as detailed in subparagraph 7(c)(1)(a)(i) above and in the Technical Implementation Procedures (TIP).

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vii) New components provided by a U.S. air carrier shall have documentation in accordance with the U.S. air carrier's Continuous Airworthiness Maintenance Program (CAMP).

(2) Used Components

(a) Used components must be traceable to FAA- and/or EASA-certificated facilities that are approved and authorized to certify the maintenance, preventive maintenance, and/or alterations which they have performed. In the case of life limited parts, the life used must be documented. The used component must be in a satisfactory condition for installation and be eligible for installation as stated in the PAH parts catalogue or aviation authority (AA) approval document. An authorized release document, as provided below, must accompany the used component.

i) An EASA Form 1 issued as a dual maintenance release must accompany used components from EU-based 14 CFR part 145 repair stations.

ii) Used components from a EASA-approved part 145 AMO not FAA-approved must not be used even if accompanied by an EASA Form 1

iii) An FAA Form 8130-3 (14 CFR § 43.9 release) issued as a maintenance release must accompany used components from a 14 CFR part 145 Repair Station.

iv) Used components provided by a U.S. air carrier shall have documentation in accordance with the U.S. air carrier's CAMP.

v) A Canadian Form One issued as a maintenance release should accompany used components from a Canadian-based AMO.

vi) Used components that have been issued a triple release (i.e., certifying compliance with FAA, EASA, TCCA requirements) on an EASA Form 1 as a maintenance release are acceptable.

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d) **Possible Cases.** The following table is a summary of possible cases:

Privileges of the dual EASA and FAA certificated maintenance organization			
United States		**Europe**	
Release Document of Final Assembly: **8130-3 Dual Release**		Release Document of Final Assembly: **EASA Form 1 Dual Release**	
Acceptable New Products/Articles: EASA Form 1 NEW 8130-3 NEW C of C Standard Parts		**Acceptable New Components**: EASA Form 1 NEW 8130-3 NEW C of C Standard Parts	
USED Products/Articles: Acceptable Used Products/Articles Release Document (input)	Final Assembly Release document (output)	**USED Components:** Acceptable Used Components Release Document (input)	Final Assembly Release document (output)
8130-3 Single	8130-3 Single	Form 1 Single	Form 1 Single
8130-3 Dual	8130-3 Dual	Form 1 Dual*	Form 1 Dual*
Form 1 Dual*	8130-3 Dual	8130 Dual	Form 1 Dual*
Form 1 Single	Form 8130-3 (see below U.S.)	8130 Single	Form 1 (see below Europe)

* For the purpose of the table above, triple release mentioned in subparagraph vi above has the same status as EASA Form 1 Dual.

11. MAJOR REPAIRS AND MAJOR ALTERATIONS.

a) **Automatically Approved Data.** All repair design data approved by EASA and/or organizations/persons approved under EASA Part 21 for use on a U.S.-registered aircraft and related articles are considered FAA-approved (FAA Order 8130.2). This does not apply to critical component repair design data developed by organizations/persons that are not the type certificate (TC)/supplemental type certificate (STC) holder.

NOTE: A critical component is defined as a part identified as critical by the design approval holder during the validation process, or otherwise by the exporting authority. Typically, such components include parts for which a replacement time, inspection interval, or related procedure is specified in the Airworthiness Limitations Section or certification maintenance requirements of the manufacturer's maintenance manual or instructions for continued airworthiness.

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TECHNICAL IMPLEMENTATION PROCEDURES

FOR

AIRWORTHINESS AND ENVIRONMENTAL

CERTIFICATION

BETWEEN THE

FEDERAL AVIATION ADMINISTRATION
OF THE
UNITED STATES OF AMERICA

AND THE

EUROPEAN AVIATION SAFETY AGENCY
OF THE
EUROPEAN Union

Revision 5
September 15, 2015

e.g. type design changes involving a component internal to the fuselage.

3.2.11 Procedures for Approval of Changes to Approved Manuals. The FAA and EASA may authorize the review and approval of changes to approved manuals, or approved parts of manuals, on behalf of each other as follows, in order to facilitate their timely approval.

(a) The CA shall forward the application and provide a statement of compliance to the VA requirements to the VA of changes to the existing limitations, performance, weight and balance, or procedures of Approved Manuals that are applicable to the VA type design. The VA shall review the changes, notify the CA of completion of its review, and may authorize signature on its behalf to the CA. The VA and the CA may agree that notification is not required on certain changes on an individual certificate holder basis.

(b) The CA shall review editorial, administrative, and other minor changes on behalf of the VA, and shall ensure that those changes meet the VA's requirements. Such revisions shall be submitted promptly for the VA's record, but the VA may authorize signature on its behalf to the CA without prior notification.

3.3 Approval of Design Data Used in Support of Repairs.

3.3.1 Design data used in support of repairs must be approved or accepted, as appropriate, by the exporting authority (State of Design). The following describes the process that shall be followed by FAA and EASA so that repair design data can be approved or accepted. Repair designs requiring the production of new parts that would constitute a design change, are not eligible for acceptance under these Implementation Procedures. However, it is permissible to fabricate parts that will be used in the repair of the individual aircraft, engine, propeller, or appliance.

3.3.2 FAA and EASA Repair Design Data Approval Process.

(a) FAA shall approve design data in support of major repairs in accordance with FAA Order 8110.4 *Type Certification;* FAA Order 8110.37, *Designated Engineering Representative Guidance Handbook;* FAA Order 8100.15, *Organization Designation Authorization Procedures*; and FAA Order 8300.16, *Major Repair and Alteration Data Approval".* Minor repairs are made in accordance with "acceptable" data, in accordance with 14 CFR Part 43.

(b) EASA shall approve design data in support of repairs in accordance with EASA Part 21 Subpart M-Repairs and EASA's procedure *Airworthiness of Type Design*. A design approval shall be issued for all repair design data.

3.3.2.1 FAA Acceptance of EASA Repair Design Data.

(a) General.

(1) Except as provided in (b) below, the FAA shall accept EASA approved design data produced under EASA Part 21 Subpart M used in support of major or minor repairs regardless of the State of Design of the product, part, or appliance, if:

(i) the FAA has certificated/validated the product or appliance, and

(ii) EASA is acting on behalf of the State of Design for the repair design data, and

(iii) EASA repair design data approval is substantiated via a repair design approval letter or a repair design approval issued under a DOA. For repair data approved prior to September 28, 2003, in France, Germany, Italy, the Netherlands, Sweden, and the United Kingdom, FAA shall accept either the AA approval document, or equivalent, or a repair design approval issued under a former national DOA as evidence of the approval, and

3.3.2.2 EASA Acceptance of FAA Repair Design Data.

(a) Non-Critical Components.

(1) EASA shall accept data used in support of major repairs regardless of the State of Design of the product, part or appliance, if:

(i) EASA has certificated/validated the product or appliance, and

(ii) the FAA is the authority of the State of Design for the repair design data, and

(iii) the FAA repair design data approval is substantiated via an FAA letter, FAA Form 8110-3, FAA Form 8100-9, FAA Form 337 or a signed cover page of a repair specification.

(2) EASA shall also accept data used in support of minor repairs when:

(i) EASA has certificated/validated the product or appliance, and

(ii) the FAA is the authority of the State of Design for the repair design data, and

(iii) the repair design data has been provided by the U.S. TC, STC, PMA, or TSOA holder, or

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(iv) the repair is not in an area that is subject to an FAA AD, unless the AD allows for acceptance of an EASA repair design approval.

(2) In these circumstances, repair design data are considered to be approved by the FAA following its approval under EASA's system. This process does not require application to the FAA or compliance findings to the FAA certification basis.

(b) For major repair design data for critical components by other than the TC/STC holder:

(1) The applicant shall submit an application to EASA with a request that the application and required information be forwarded to the applicable FAA Directorate Standards Staff as listed in Appendix A.

(2) In cases where the applicant has entered into an arrangement with the TC/STC holder, EASA shall confirm this to the FAA. FAA shall issue a letter approving the major repair based on EASA's repair data approval without further technical review.

(3) In cases where the applicant has not entered into an arrangement with the TC/STC holder, EASA shall ensure that each application

(iv) for minor repairs from other than the U.S. TC, STC, PMA, or TSOA holder, the determination that data are acceptable (under 14 CFR Part 43) has been made by a U.S. maintenance organization under FAA's authorized system,

Note: An EASA approved maintenance organization must use EASA Part 21 for the approval of repair data for use on an EU-registered aircraft, unless the data for a minor repair has been previously used to repair an N-registered aircraft.

(3) In these circumstances, repair design data are considered to be EASA-approved following its approval or acceptance under FAA's system. This process does not require application to EASA or compliance findings to the EASA certification basis.

(b) Critical Components

(1) EASA shall accept any critical component repair design data from a TC/STC holder, regardless of the State of Design of the product, if.

(i) EASA has certificated/validated the product, and

(ii) the FAA is the authority of the State of Design for the

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contains the following:

(i) drawings, specifications and other data necessary to define the configuration and design features of the repair;

(ii) a compliance summary that identifies the applicable airworthiness standards, methods of compliance, and compliance results;

(iii) substantiation for continued applicability of existing ICAs or supplemental ICAs, if any; and

(iv) an EASA statement that the approved repair brings the product or part back to an airworthy condition.

(4) FAA shall then issue a letter approving the major repair design following issuance of EASA's repair design approval.

repair design data.

(iii) In these circumstances, repair design data are considered to be EASA-approved following its approval under FAA's system. This process does not require application to EASA or compliance findings to the EASA certification basis.

(2) EASA shall approve critical component repair design data by other than the TC/STC holder, regardless of the State of Design of the product, as follows:

(i) The applicant shall submit an application to the FAA with a request that the application and required information be forwarded to EASA, as listed in Appendix A. The application for approval of the repair design data shall be made to EASA in the manner prescribed on EASA's website.

(ii) In cases where the applicant has entered into an arrangement with the TC/STC holder, the FAA shall confirm this to EASA. EASA shall issue a major repair design approval based on the FAA's letter without further technical review.

(iii) In cases where the applicant has not entered

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into an arrangement with the TC/STC holder, the FAA shall ensure that each application contains the following:

(a) drawings, specifications and other data necessary to define the configuration and design features of the repair;

(b) a compliance summary that identifies the applicable airworthiness standards, methods of compliance, and compliance results;

(c) substantiation for continued applicability of existing ICAs or supplemental ICAs, if any;

(d) the applicant's justification that an arrangement is not necessary;

(e) a statement of FAA concurrence to the applicant's justification; and

(f) an FAA statement that the approved repair brings the product or part back to an airworthy condition.

(iv) EASA shall then issue a major repair design approval based on FAA's statement.

Summary

- **Benefits of DER Approved Repairs**
  - ✓ Often deliver benefit of reduced maintenance costs
  - ✓ Many times improve availability of parts, getting your aircraft back into revenue sooner
  - ✓ Offer the potential for design improvements that enhance aircraft utilization and lower operating cost

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QUESTIONS?

Contacting DERS Group Svc LLC

- Those requesting the available Training Certificate for FSDO Credit under AC65.25C can make a request below, or through WWW.Gorham-Tech.com

- WWW.DERS-GROUP.COM
- Office Phone: 812-645-4864
- Email: faader@ders-group.com

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