



Federal Aviation Administration

Memorandum

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To: ACO Managers

Cc: ACMT

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Subject: Authorization and Delegation of Functions Related to the Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety Rule (EAPAS/FTS)

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This memo replaces the 12/13/07 memo on the same subject and provides guidance for utilizing Designated Engineering Representatives (DERs) and delegated organization engineering Unit Members (UMs) to support implementation of the Title 14 Code of Federal Regulations (CFR) part 25 and part 26 requirements in the Enhanced Airworthiness Program for Airplane Systems/Fuel Tank Safety (EAPAS/FTS) Rule. This memo describes the proper use of delegated functions and authorized areas related to Electrical Wiring Interconnection Systems (EWIS) for Electrical Systems (Chart C2) DERs/UMs or any other DERs/UMs who are authorized to make findings to wire flammability requirements. The guidance in this memo should be shared with all relevant DERs and delegated organizations.

The part 25 and part 26 requirements treat electrical wiring and associated components as a system and mandate that wiring designs meet specific requirements as supported by analysis, installation, and maintenance requirements. It is very important that design approval holders address the continued airworthiness of wiring. This includes developing EWIS-related Instructions for Continued Airworthiness (ICA) that are FAA-approved. Although DERs and delegated organizations cannot approve these ICA, they can significantly reduce the FAA burden by providing recommendations for approval to the FAA through their technical involvement. Each Aircraft Certification Office (ACO) and Aircraft Evaluation Group (AEG) should use their established procedures for coordinating ICA and follow the additional policy provided in the AIR-100 memo dated 4/6/10 regarding EWIS ICA approval: "Approval of Electrical Wiring Interconnection System (EWIS) Instruction for Continued Airworthiness (ICA) Using an Enhanced Zonal Analysis Procedure (EZAP for Holders of Type Certificates, Amendments to Type Certificates, and Supplemental Type Certificates, Including Changes to Supplemental Type

Certificates." In case existing office procedures conflict with the guidance contained in the policy memorandum, the procedures in the memorandum take precedence.

Electrical Systems (Chart C2) DERs and corresponding delegated organization UMs can be authorized with specific delegated EWIS authority under the delegated functions of Detail Design and Installation, and Safety Analysis. Each of these functions can include multiple EWIS-specific compliance activities.

Existing DERs/UMs can apply for expansion of their existing authority to include EWIS related requirements as listed in Attachment 1. Each DER/UM with the delegated functions of Detail Design and Installation and/or Safety Analysis would then be specifically authorized for the EWIS areas of Design, Analysis, Installation and/or Maintenance, as suitable to their qualifications. Because of the complexity of the EWIS certification requirements it is rare that a DER/UM will fully qualify in all areas of EWIS-delegated authority. The Transport Airplane Directorate has developed criteria that will help define how to properly set up the authorization scope for a DER/UM. This information is provided in Attachments 1 and 2 to this memo.

The EWIS rules may be delegated as shown in the Attachment 1 Table. Section 25.1701 is the definition of EWIS and does not require a finding of compliance. However, a determination that the system meets the definition of 25.1701 would be made through the finding of compliance of the other requirements that are applicable to EWIS. In other words, it is expected that the EWIS undergoing certification would first be identified in the compliance plan using the definition in 25.1701 before compliance to EWIS-related requirements can be found. The compliance plans required by the design approval holder (DAH) § 26.11 cannot be delegated. Also, the FAA does not delegate findings of compliance to the part 26 EWIS requirements and certain areas of authority are limited to only recommend approval (R). As EWIS ICA arise from technical data, they can be delegated for recommend approval, but approval is reserved for the ACO.

The table in Attachment 1 should be tailored for each DER/UM who will have EWIS authority. The tailored table will show the specific delegated authority for each DER/UM. For DERs, this table and any associated limitations or specific delegations should be provided to the DER and also captured in the Designee Information Network (DIN) as an attachment under "additional information."

The delegation information in this memo will be included in future revisions to FAA Order 8110.37, *Designated Engineering Representative (DER) Guidance Handbook*; Order 8110.54, *Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents*; and Order 8100.8, *Designee Management Handbook*. We expect that this guidance will serve to standardize all future DER/UM appointments that involve the EWIS related delegated functions and authorized areas, as well as their use in EWIS ICA approvals.

Attachment 1: Qualifications and Areas of Delegated Authority for EWIS Designees

Attachment 2: Extra Application Requirements for EWIS-Related Delegation Authority

Attachment 1

Qualifications and Areas of Delegated Authority for EWIS Designees

Qualifications for DERs/UMs with Delegated Functions Related to EWIS Areas

An applicant for the delegated functions related to EWIS must satisfy the general requirements for delegated authority specified in FAA Order 8100.8, *Designee Management Handbook*, and have the specific qualifications described below. The applicant's qualifications must include a work history that demonstrates "hands-on" experience in performing and reviewing various aircraft EWIS activities at the detailed level. We expect that it will be rare for a DER/UM to not have any limitations in the approved areas delegated to him. The limits in authority should compensate for any deficiencies in the qualifications needed for EWIS authority. An applicant's knowledge and experience with each of the applicable regulations and each applicable advisory circular must be considered when determining the specific authority that will be delegated.

An applicant for EWIS related delegated authority must complete the forms in Attachment 2 to this memo and include them in the application package. The applicant must attach supporting evidence of his experience and familiarity that meets the specific requirements in each area requested. This supporting evidence should demonstrate his working knowledge and understanding of the specific part 25 sections related to EWIS, and the applicable advisory circulars. An applicant should also be able to demonstrate that he understands why we are treating electrical wiring and its associated components as a system.

Areas of EWIS Delegated Authority

Any applicant for EWIS-related delegated authority must specify the areas for which he is seeking authorization and must meet all of the requirements for those areas. The table below shows the four EWIS areas that are available for authorization and delegation.

Examples of activities involving each of the four areas of delegation in the table are provided below for the purpose of justifying experience in each area:

Design – activities such as system/component power requirement assessment, wire sizing/selection, wire bundle design considering the environment effects, duty cycle, altitude, and other de-rating factors, etc.

Installation – activities such as wire routing, wire bundle fabrication, installation drawing preparation, wire length determination, form boards, etc.

Analysis – activities such as developing and reviewing electrical load analysis, zonal and enhanced zonal analysis, system safety analysis, failure mode and effect analysis, etc.

Maintenance – activities such as developing/performing maintenance tasks, ICA, standard wiring practice manual, etc.

Note 1: To satisfy the compliance needs for each regulation listed in the Table, statements must exist for each area marked "X." An "R" in the column indicates that only a "recommend approval" may be submitted to the ACO. Only the ACO may approve EWIS ICA. For instance, compliance statements for Design, Analysis, and Installation are required for § 25.1709; and recommend approval compliance

statements from the designees with delegation authority in EWIS areas of Design, Installation, and Maintenance are required for § 25.1729.

Note 2: the note column indicates that the DER/UM must apply for delegated authority. Refer to “Additional Application Requirements for EWIS Related Authority” attachment for minimum qualification, Attachment 2.

Table: EWIS Areas of Delegated Authority

	Electrical Wiring Interconnection Systems (EWIS)				
	Design	Installation	Analysis	Maintenance	Note
Part 25, Subparts D,E,F					
25.611(b)	X	X			Note 2
25.855(j)	X	X		X	Note 2
25.869(a)	X	X			Note 2
25.899	X	X			current HIRF/ Lightning / EMC delegation authority.
25.1203 (h)	X	X			Note 2
25.1301(b)	X	X	X		Revised FAR can be added to current delegation authority.
25.1309(f)	X	X	X		Revised FAR can be added to current delegation authority.
25.1310	X	X	X		Revised FAR can be added to current delegation authority.
25.1353	X	X	X		No new authorization is necessary. Designee’s current delegation authority is sufficient.
25.1357	X		X		No new authorization is necessary. Designee’s current delegation authority is sufficient.
25.1360(a)	X	X			Note 2
25.1362	X	X			Note 2
25.1365	X	X	X		Note 2
Part 25, Subpart H					Note 2
25.1701	N/A	N/A	N/A	N/A	Note 2
25.1703	X	X		X	Note 2
25.1705	X	X	X		Note 2
25.1707	X	X	X	X	Note 2
25.1709	X	X	X		Note 2
25.1711	X	X		X	Note 2
25.1713	X	X			Designees who currently find compliance to 25.869 may find compliance to 25.1713 without further qualification.

25.1715	X	X		X	Note 2
25.1717	X	X			Note 2
25.1719	X	X			Note 2
25.1721	X	X		X	Note 2
25.1723	X	X			Note 2
25.1725	X	X			Note 2
25.1727	X	X			Note 2
25.1729	R	R		R	Note 2
25.1731	X	X			Note 2
25.1733	X	X			Note 2
Part 25, Appendix H					Note 2
H25.4	X			R	Note 2
H25.5(a)(1)	R	R	R	R	Note 2
H25.5(a)(2)	R	R		R	Note 2
H25.5(a)(3)	R	R		R	Note 2
H25.5(a)(4)	R			R	Note 2
H25.5(a)(5)	R		R	R	Note 2

Attachment 2

Additional Application Requirements for EWIS-Related Delegation Authority

Any applicant for EWIS-related authority must complete this sheet in addition to 8100.8 requirements when requesting EWIS-related delegated functions. Provide supporting evidence of experience/familiarity in each required area.

Name _____

Date _____

Describe experience that demonstrates thorough working knowledge and understanding of the EWIS rules. This includes a thorough understanding of the intent of the regulations.

Qualifications for each of the specific authorized areas for EWIS (attach supporting information for each):

DESIGN

- | | | |
|------------|-----------|---|
| Yes | No | Have an Engineering degree plus four years employment experience in aircraft wiring design. |
| Yes | No | Have a thorough working knowledge and experience in each of the following areas: |
| | | 1. electrical systems types and characteristics for transport airplanes |
| | | 2. designing wiring in a factory setting for transport airplanes |
| | | 3. developing test producers for testing and inspecting electrical wiring |
| | | 4. wire and cable selection |
| | | 5. wire connection and associated hardware |
| | | 6. aspects of DO-160 and Advisory Circular (AC) 43.13-1B |

INSTALLATION

- | | | |
|------------|-----------|--|
| Yes | No | Have a minimum of 4 years employment with practical experience in wiring installations for aircraft. |
| Yes | No | Have a thorough working knowledge and experience in each of the following areas: |
| | | 1. wire installations in a factory setting in transport airplanes |
| | | 2. performing wiring inspection |
| | | 3. aircraft wire types and their unique characteristics. |
| | | 4. aircraft zones and unique characteristics. (e.g., temperature, vibration, moisture, etc.). |
| | | 5. wire connection and installation hardware |
| | | 6. aircraft wiring separation standards and wiring best practices |

ANALYSIS

- | | | |
|------------|-----------|---|
| Yes | No | Have an Engineering degree. |
| Yes | No | Have a thorough working knowledge and experience that includes the application or development of each of the following: |
| | | 1. aircraft electrical load analysis |
| | | 2. safety analysis |
| | | 3. industry EWIS design standard |
| | | 4. aircraft Functional Hazard Assessments |
| | | 5. system Functional Hazard Assessments |
| | | 6. System Safety Assessments (Fault Tree Analysis/Dependence Diagrams) |
| | | 7. Failure Modes and Effects Analysis Common Cause Analyses (Zonal Analysis/Common Mode Analysis) |

MAINTENANCE

- | | | |
|------------|-----------|---|
| Yes | No | Have a minimum of 4 years employment with a thorough working knowledge and experience in each of the following areas: |
| | | 1. performing electrical wiring maintenance at a maintenance facility |
| | | 2. performing wiring tests, inspections, troubleshooting, |
| | | 3. wire and cable selection |

4. wiring components and installation hardware
5. Standard Wiring Practice Manual
6. aircraft zonal analysis
7. wiring inspection techniques (e.g., visual inspection, detailed visual inspection, etc.).
8. Understanding of and experience with the aspects Advisory Circular (AC) 43.13-1B