

System Wiring Policy

System Wiring Policy for Certification of Part 25 Airplane



Greg Dunn

***FAA, Transport Airplane Directorate,
Airplane & Flight Crew Interface***

Seattle, Washington November 6, 2001

Background

- **System Wiring Policy published in Federal Register, July 2, 2001**
- **No Negative Comments received from public**
- **Applicable to TC, STC Projects**
 - **Not applicable to one-only STC's**
- **New Expectations on Quality of Type Design Data submitted for Certification**
- **Projects started prior to July 2nd encouraged to comply**
 - **FAA discretion in compliance with policy**

Why This Policy?

- ➔ **Ambiguous Definition of Configuration**
 - **Wire Routing**
 - **Lack of Installation Details**
- ➔ **System Safety Assessment**
 - **Lack of wire bundle failure analysis**
 - **Other airplane system effects often neglected**

Why This Policy?

→ Reference to General Practices

- “Wire according to practices in AC 43-13”
- “Wire in accordance with industry practice”

→ Omission of Manufacturing Process Specs

- Poor specification led to lack of standardization
- Undefined Processes

Why This Policy?

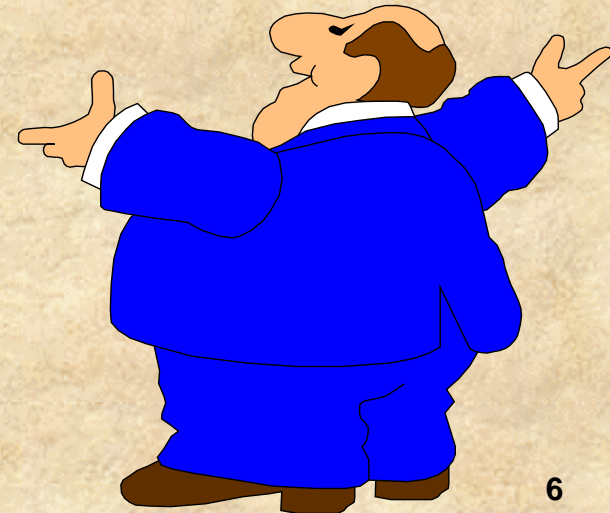
- ➔ **Modification not compatible with Original Type Design Standards**
 - brackets, clamping
 - wire
 - separation standards
- ➔ **Instructions for Continuing Airworthiness**
 - wire in conduits
 - harsh environments (vibration, temp, contamination)
 - over reliance on visual inspections

Statement of FAA Policy on System Wiring

→ Unambiguous Definition of Configuration

- Wiring Diagrams showing source and destination
- Installation Drawings showing
 - equipment location
 - wiring routing
 - mounting and supporting details

⇒ Ensures consistent, repeatable installation practices



Statement of FAA Policy on System Wiring

→ System Safety Assessment

- ensure that wiring failures do not constitute an unacceptable hazard
- failures of system wire do not jeopardize continued safe flight and landing
- failures of wire and wire bundles due to fire should be assessed

⇒ requires understanding of airplane manufacture's wire installation design rules, especially separation



Statement of FAA Policy on System Wiring

→ Specific Installation Drawing Expectations

- Avoid general references to wiring installation details
- Precise description of wiring installations expected
- Installation Drawings and Wiring Diagrams are expected

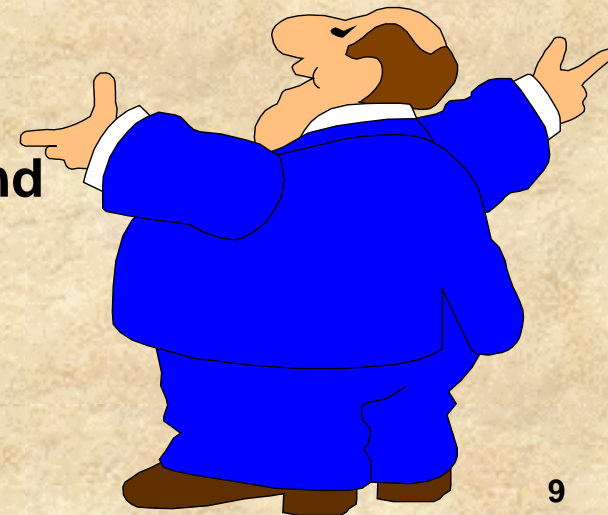


Statement of FAA Policy on System Wiring

→ Process Specifications

- specification of parts used in wire installation need to be defined so that:
 - conformity can be verified
 - characteristics for test or analysis may be determined
 - includes specs for wire, mounting hardware, connectors, ground terminations, etc

Example: drawings define material specs, including heat treat, corrosion protection, and all other important material properties



Statement of FAA Policy on System Wiring

→ Modifications Compatible with Original Standards

- Compatible or consistent with Original Airplane Manufacture's design philosophy
- Wire separation, wire types, bundle sizes, brackets, and clamping should be consistent with approved type certified standards

⇒ require familiarity with OAM maintenance manuals,(standard practices airframe, engine, wiring)



Statement of FAA Policy on System Wiring

→ Instructions for Continued Airworthiness

- Wire condition relies heavily on visual inspection
- Modifiers should understand limitations of this technique and address inspectability in conduits and hard to inspect areas

⇒ in situ techniques which do not require visual inspection are being developed



Concluding Remarks

- ➔ **This Wiring Policy is not a regulatory requirement**
- ➔ **Modifiers and Certification personnel should attempt to follow this policy**
- ➔ **Certification personnel have discretion to determine the extend of compliance required**
- ➔ **Issues related to non-compliance should be addressed via an issue paper**



Comments/Questions

