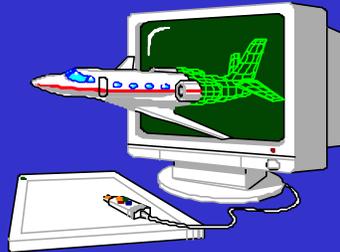


FAA National Software Conference Software Conformity Inspection and Review



Software Conformity Notice 8110.86



Software Standardization
Conference
August 8 - 11, 2000

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Based in Rule

- **14 CFR Part 21, Section 21.33 Inspection and Tests (b):**
 - *“(2) That materials and products conform to the specifications in the type design; (3) That parts of the products conform to the drawing in the type design; and (4) That the manufacturing processes, construction and assembly conform to those specified in the type design.”*

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Amplified in FAA Order

- **FAA Order 8110.4B, Paragraph 2-11f: Conformity & witnessing of Tests**
 - *“The conformity of the test article, test setup, test procedures used, and the validity of the test results **must be established** for each test conducted to show compliance with a type certification requirement . . .”*



Amplified in FAA Order

- **FAA Order 8110.4B, Paragraph 2-11g: Conformity Inspections**
 - *“A conformity inspection is required to ensure that the product being certificated complies with the type design. . . . An FAA conformity inspection should be successfully conducted before any official FAA tests (ground or flight) are conducted. . . .”*

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Order 8110.4B & RTCA DO-178B

- Order 8110.4b
 - “... establishes procedures for accomplishing the **evaluation and approval** of aircraft type design data ...”
- RTCA DO-178B
 - “... provide guidelines for the **production** of software for airborne systems and equipment that performs its intended function with a level of confidence in safety ...”



Notice 8110.86

- GUIDELINES FOR SOFTWARE CONFORMITY INSPECTION AND SOFTWARE CONFORMITY REVIEW
 1. Purpose
 2. Distribution
 3. Related Publications
 4. Background
 5. *Discussion and Procedures*
 6. Conclusion

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Official FAA Tests

- “... *An FAA conformity inspection should be successfully conducted **before any official FAA tests** (ground or flight) are conducted. . . .”*
- Another words, any test in which certification credit is taken



Baseline

- **RTCA DO-178B**
 - “The approved, recorded configuration of one or more configuration items, that thereafter serves as the basis for further development, and that is changed only through a change control process.”

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Loose Interpretation

- **Black Label**
 - Final baseline
- **Red Label**
 - Any baseline that precedes final baseline



Discussion & Procedures

- **Design Assurance Software Conformity Inspection**
- **Installation Conformity Inspection**
- **Software Conformity Review**

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Design Assurance Software Conformity Inspection

- To ensure that the test configuration of the software complies with its test baseline before a test for **Certification credit** is executed
 - Development Workstation
 - Test Laboratory
 - Aircraft



Design Assurance Software Conformity Inspection (cont.)

- DO-178B SCM process utilized for assurance
 - Integral process
 - Plan and records in place
 - Visibility to a defined and controlled configuration
 - Known point of review
 - Evidence of approval
 - Control, archival, and recovery

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Design Assurance Software Conformity Inspection (cont.)

- **Requires:**
 - Baseline identifies relevant software life cycle data
 - Development/Verification tools
 - Procedures used for retention, archival, & retrieval is compliant to the SCMP



Design Assurance Software Conformity Inspection (cont.)

- **Requires:**
 - ACO ASE has concurred the baseline complies to its requirements and approved software plans. Or,
 - DER approval via FAA Form 8110-3
 - (unchanged code is not effected, changed code does not impact unchanged code and is of a design appropriate for its intended function)

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Software Installation Conformity Inspection

- **When?**
 - After a Design Assurance Conformity Inspection
 - During or after the software is loaded
 - System containing the software is installed on the aircraft
- Before any **official** FAA ground or flight test



Software Installation Conformity Inspection (cont.)

- **WHY? To assure:**
 - Approved & controlled software version
 - Loads successfully I/A/W approved procedures
 - Successfully initializes

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Software Installation Conformity Inspection (cont.)

- **One of two methods:**
 - **Witness:**
 - loading of correct software to the actual system
 - Integrity check used to verify load
 - Successful execution of initialization procedure
 - **Review of manufacturing records**
 - documented results
 - Identification
 - Traceable



Software Conformity Review

- **RTCA DO-178B Section 8.3**
- **Applicant's responsibility**
- **Not performed by an ASE, ASI, or Designee**