



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
National Policy

Order
8110.55A

Effective Date:
11/15/2011

SUBJ: How to Evaluate and Accept Processes for Aeronautical Database Suppliers

- 1. Purpose of This Order.** This order explains how Federal Aviation Administration (FAA) aircraft certification service staff can evaluate and accept the aeronautical data processes of a data supplier who meets the criteria of Advisory Circular (AC) 20-153A, *Acceptance of Aeronautical Data Processes and Associated Databases*. We describe procedures for aircraft certification service staff to grant acceptance through a FAA Letter of Acceptance (LOA) to aeronautical data suppliers.
- 2. Audience.** All aircraft certification office (ACO) staff involved in issuing an LOA to aeronautical data suppliers.
- 3. Where Can I Find This Order?** You can find this order on our website at http://www.faa.gov/regulations_policies/orders_notices/.
- 4. Cancellation.** FAA Order 8110.55, issued on September 30, 2005, is cancelled.
- 5. Summary of Major Changes and Scope.** This order:
 - a.** Expands the scope of LOAs to include terrain, obstacle, and airport map databases.
 - b.** Establishes skills and knowledge criteria for selection and training of ACO project engineers assigned to an LOA project.
 - c.** Provides additional guidance on the conduct of an LOA audit and materials to more effectively support project engineers in training for, planning, establishing, and maintaining an LOA.
- 6. Who Receives an LOA?** We grant a Type 1 or Type 2 LOA, defined in AC 20-153A, to a data supplier in support of an operator who requires evidence of compliance with RTCA/DO-200A, *Standards for Processing Aeronautical Data*, for operational approval. The LOA can also be used in support of a maintenance task per the instructions for continued airworthiness.
- 7. Skills and Training.** Project engineers assigned to an LOA project should satisfy the following criteria:
 - a.** Have a basic level of skill and competency, acquired through previous experience or obtained through additional training in at least two of the following areas:
 - Audit team leadership or previous audit team participation (e.g., previous LOA audits, internal auditing, quality management auditing, etc.).

- Previous type certification experience using RTCA/DO-200A, *Standards for Processing Aeronautical Data*.
- Knowledge of basic International Organization for Standardization (ISO) quality management concepts and/or auditor training.
- RTCA/DO-200A tool qualification concepts and review methods (experience in RTCA/DO-178B or RTCA/DO-254 tool qualification concepts is also acceptable).
- Aircraft Certification Systems Evaluation Program (ACSEP) training or experience.
- Software Engineering Institute Capability Maturity Model (SEI CMM) assessment.

b. If an LOA project engineer needs additional training to augment their current technical knowledge and skills, then the training courses referenced in appendix A, paragraph 1.c of this order should be considered.

8. Establishing a FAA LOA for Aeronautical Data Suppliers. An ACO has the following responsibilities toward LOA applications:

a. The ACO in the geographic area of the applicant's processing facility should accept the LOA application from a data supplier. The ACO will evaluate the LOA application, make audit preparations, conduct the audit, process the audit results with the applicant, and maintain the LOA.

b. If the data supplier is outside the United States, we will not issue an LOA.

c. Non-U.S. data suppliers may show their data processes meet RTCA/DO-200A, or the direct equivalent EUROCAE ED-76, to their responsible national authority. Their authority's approval of these processes may be considered acceptable and equivalent to the LOAs in AC 20-153A. Data suppliers should identify the relevant authority and approval method (for example, a European Aviation Safety Agency LOA) to their data customers. A Type 2 LOA application may involve a Type 1 foreign data supplier. In this case, the FAA verifies the foreign supplier's approval is legitimate, and endorses that legitimacy in the LOA (see AC 20-153A, appendix 2, paragraph 7 of figures 1, 2, and 3).

9. Preparing for the Audit.

a. Upon receipt of an initial LOA application, experience has shown approximately 30 days is usually needed for the project engineer to review a data supplier's application package, conduct audit planning, assemble and schedule an audit team, and develop an audit plan prior to conducting an audit of the applicant's facility. To schedule the audit, the project engineer will need to assemble an audit team, produce an agenda for the audit with the applicant, and ensure that audit team members are also able to review the data supplier's application package prior to the audit.

b. **Compose the Audit team.** For a first-time LOA application, the project engineer will compose the audit team, which may include, but is not limited to, ACO engineers, manufacturing inspectors, plus directorate and headquarters staff. A typical audit team usually consists of 2-5 people, and should include at least one member familiar with the avionic systems using the data

(e.g., navigation), and at least one additional member familiar with RTCA/DO-200A tool qualification and review methods.

c. Audit team members should review the data supplier's application described in RTCA/DO-200A, section 2.2 to verify whether the data quality requirements and processing standards meet AC 20-153A. Verify the scope of the data to be covered by the LOA.

d. Ensure the applicant submitted a statement certifying a quality management system (QMS) is established as required by AC 20-153A. Evaluate the data submitted as evidence of compliance.

10. Steps for Auditing the Facility.

a. Evaluate and audit the applicant's facility before issuing an LOA. The initial audit should be conducted at the applicant's facility, but subsequent audits may be off-site or accomplished with documentation review. This audit should be conducted at the applicant's facilities where database processing takes place to ensure the applicant meets the criteria of AC 20-153A.

b. Base the audits on how the applicant demonstrates compliance with AC 20-153A and RTCA/DO-200A focusing on areas which have a higher risk if erroneous data is produced. RTCA/DO-200A section 3 highlights the use of an audit as the means of demonstrating compliance.

c. Type 2 LOAs for Existing Systems. For data suppliers seeking a Type 2 LOA using compliance to RTCA/DO-200, *Preparation, Verification and Distribution of User-Selectable Navigation Data Bases*, the data package requirements must be modified as specifically prescribed in AC 20-153A, paragraph 9.b.(4) using the alternative means guidance described in AC 20-153A, paragraph 19.a.

d. Send a letter to the applicant notifying them of a facility audit no less than 15 working days before the audit. The letter should explain the audit's expectations and objectives, and inform the applicant what staff must be on site during the audit.

e. Evaluate the interfaces between data originators, type design holders, airline operators, and any end-user. Audit the means by which recipients tell the originator that they received erroneous or inconsistent data. Evaluate the applicant's procedures for rapid and effective corrective action.

(1) Where questionable data cannot be resolved, audit the applicant's method for handling this issue. Make sure the applicant has effective controls to prevent the release of an unsafe product, and the impact of questionable data to end-users is communicated.

(2) For interfaces with type design holders, audit the communication procedures to ensure the equipment type design holders talk to applicants about compatibility issues and constraints between equipment and their databases.

(3) For airline operators and end user applicants, audit the procedures to learn how the operator or end user handles originated (e.g., tailored) data, and whether they have procedures for confirming the data comes from a technically competent and valid source.

f. Audit the Objectives, Procedures, and Reports. Auditors should be looking for objective evidence of how each compliance objective is accomplished and the corresponding reference in the applicant's documentation. If an objectives matrix from appendix 3 of AC 20-153A is submitted by the applicant, it should be used by auditors to determine how and where AC 20-153A and RTCA/DO-200A objectives are met. At the end of each day, the lead auditor should meet with the facility managers, report and discuss any issues, and set the agenda for the next day's assessment. The final audit report should be compiled and issued prior to leaving the applicant's facility. The final audit report should list audit findings to the objectives of AC 20-153A (see appendix 3 of AC 20-153A) as follows in descending order of severity:

- Non-Compliances – NC (must be fixed prior to issuance or may result in suspension of LOA),
- Deficiencies – D (requires agreed upon timeline prior to issuance of LOA or further action), and
- Observations – O (professional judgment or opinion issues for highlight and suggestion).

The final audit report should also list or discuss:

- Special emphasis items (i.e., taskings, required follow-ups, clarification actions, etc.),
- Corrective actions, and
- Recommendations for FAA acceptance, or conditions required for acceptance.

g. The lead FAA auditor and facility leader sign the report, and the auditor files it in the project folder.

11. Recording and Distributing the LOA.

a. New LOA numbers should follow the numbering convention for existing projects. The number should be unique for each LOA holder, and carried on all subsequent supplements to it. One means to number is to compose with the prefix "LOA," followed by a format similar to that used for Supplemental Type Certificates (STCs), a four-digit number (unique to each LOA), and add two alpha digits to identify the project ACO (see FAA Order 8110.4C, *Type Certification*, appendix 1, figure 5). To illustrate, "LOA0018LA" represents the 18th LOA issued by the Los Angeles ACO. After reviewing the applicant's aeronautical data process and QMS, an ACO representative will sign the LOA affirming FAA acceptance of the aeronautical data process. See AC 20-153A, appendix 2 for samples of Type 1 and 2 LOAs.

b. Prepare the acceptance letter for all initial LOAs, and transmittal letter for all subsequent LOAs, in triplicate. Give the original to the applicant. Keep one copy at the issuing office. Send one copy to the Avionics Systems Branch (AIR-130), 470 L'Enfant Plaza, Suite 4102, Washington, DC 20024.

12. Post LOA Activity.

a. An ACO may have to reevaluate an applicant's QMS when an LOA holder transfers their data production facilities, including supplier facilities delegated with major inspection functions, or when an LOA holder expands operations to include more production facilities at other locations.

b. An LOA is not transferable to another person, company, or location. While actual production and distribution of databases may be done by a third party under license, the responsibility for the terms and conditions of a particular LOA remain with the holder of the LOA.

c. The ACO project engineer should inspect the LOA holder's facilities periodically to ensure the holder continues to meet the criteria of AC 20-153A and RTCA/DO-200A.

d. The ACO can revoke the LOA if the LOA holder does not resolve outstanding deficiencies from an audit report, comply with the specified terms and conditions of their LOA, or satisfactorily remedy non-compliance issues within an agreed timeframe.

13. Use of Designated Engineering Representative (DERs) in LOA Projects. DERs do not have authority to issue LOAs for the aeronautical data process, or to alter the issued LOA.

14. Authority to Change This Order. The issuance, revision, or cancellation of the material in this order is the responsibility of the Aircraft Engineering Division (AIR-100).

15. Suggestions for Improvement. If you find deficiencies, need clarification or want to suggest improvements to this order, send FAA Form 1320-19, *Directive Feedback Information*, (written or electronically) to the Aircraft Certification Service, Administrative Services Branch, AIR-510, Attention: Directives Management Officer. You can also send a copy to the Aircraft Engineering Division (AIR-100), 950 L'Enfant Plaza, 5th Floor, Washington, DC 20024, Attention: Comments to Order 8110.55. If you urgently need an interpretation, you can contact the Avionics Systems Branch, AIR-130 at 202-385-4630 or Avionics Systems Branch (AIR-130), 470 L'Enfant Plaza, Suite 4102, Washington, DC 20024. Always use Form 1320-19 to follow up each verbal conversation.

16. Records Management. See FAA Order 0000.1, *FAA Standard Subject Classification System*, Order 1350.14, *Records Management*; and Order 1350.15, *Records, Organization, Transfer, and Destruction Standards*, or see your office Records Management Officer/Directives Management Officer for guidance on retaining or disposing of records.



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APPENDIX A**References****1. Related References.** All references to FAA documents in this order are to the current version.

a. FAA ACs. You can get copies from our website at www.faa.gov/regulations_policies/advisory_circulars/.

- (1) AC 20-115, RTCA, Inc., Document RTCA/DO-178B.
- (2) AC 20-153A, *Acceptance of Aeronautical Data Processes and Associated Databases*.

b. FAA Orders. You can get copies from our website at http://www.faa.gov/regulations_policies/orders_notices/.

- (1) FAA Order 0000.1, *FAA Standard Subject Classification System*.
- (2) FAA Order 1350.14, *Records Management*.
- (3) FAA Order 1350.15, *Records, Organization, Transfer, and Destruction Standards*.
- (4) FAA Order 8110.4C, *Type Certification*.

c. FAA Training Courses. You can take online courses, register for training, and view your training history from our website at <https://elms.dot.gov/>.

- (1) FAA Course 27200036, *Letter of Acceptance (LOA) Audit for Project Engineers*.
- (2) FAA Course 30030006, *Lead Auditor – Quality Management System (QMS)*.
- (3) FAA Course 28463, *Basic Compliance Auditing for AVS Personnel*.
- (4) FAA Course 24915, *ISO Internal Auditor Course*.
- (5) FAA Course 21030, *Software Fundamentals*.
- (6) FAA Course 21045, *Software Job Functions*.

d. RTCA, Inc. Documents. You can order copies of RTCA documents from RTCA, Inc., 1150 18th Street NW, Suite 910, Washington, D.C. 20036. Telephone: (202) 833-9339. Also, order copies online at <http://www.rtca.org>.

- (1) RTCA/DO-178B, *Software Considerations in Airborne Systems and Equipment Certification*, dated December 1, 1992 and its equivalent, EUROCAE document ED-12B, *Software Considerations in Airborne Systems and Equipment Certification*.

(2) RTCA/DO-200, *Preparation, Verification and Distribution of User Selectable Navigation Data Bases*, dated November 28, 1988.

(3) RTCA/DO-201, *User Recommendations for Aeronautical Information Services*, dated November 28, 1988.

(4) RTCA/DO-200A, *Standards for Processing Aeronautical Data*, dated September 28, 1998 and its equivalent, EUROCAE document ED-76, *Standards for Processing Aeronautical Data*.

(5) RTCA/DO-201A, *Standards for Aeronautical Information*, dated April 19, 2000 and its equivalent, EUROCAE document ED-77, *Standards for Aeronautical Information*.

(6) RTCA/DO-236B, *Minimum Aviation System Performance Standards: Required Navigation Performance for Area Navigation*, dated October 28, 2003.

(7) RTCA/DO-254, *Design Assurance Guidance for Airborne Electronic Hardware*, dated April 19, 2000.

(8) RTCA/DO-272B, *User Requirements for Aerodrome Mapping Information*, dated April 14, 2009 and its equivalent, EUROCAE document ED-99B, *User Requirements for Aerodrome Mapping Information*.

(9) RTCA/DO-276A, *User Requirements for Terrain and Obstacle Data*, dated August 3, 2005 and its equivalent, EUROCAE document ED-98A, *User Requirements for Terrain and Obstacle Data*.

(10) RTCA/DO-291A, *Interchange Standards for Terrain, Obstacle and Aerodrome Mapping Data* dated April 14, 2009 and its equivalent, EUROCAE document ED-119A, *Interchange Standards for Terrain, Obstacle and Aerodrome Mapping Data*.

e. Airlines Electronic Engineering Committee (AEEC), ARINC, Inc. Documents. Order copies of ARINC documents from ARINC Incorporated, 2551 Riva Rd., Annapolis, MD, 21401. Telephone +1 800-633-6882, fax +1 410-956-5465. You can also get copies online at www.arinc.com.

(1) ARINC Specification 424, *Standard, Navigation System Data Base*.

(2) ARINC Specification 816, *Embedded interchange Format for Airport Mapping Database*.