



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

**ORDER
4040.26C**

National Policy

Effective date:
10/05/2021

SUBJ: Aircraft Certification Service Flight Test Risk Management

- 1. Purpose of this Order.** This order establishes flight test risk management program requirements for the Federal Aviation Administration (FAA) Aircraft Certification Service (AIR). Anyone participating in certification flight test activities must observe all elements of this order. This order is designed to complement FAA Order 8040.4, *Safety Risk Management*.
- 2. Audience.** This order applies to all individuals involved in AIR Flight Test activities, and their managers. For the purposes of this order, both aviation safety engineers (ASE) and human factors (HF) specialists whose duties include flight testing are referred to as flight test engineers (FTE). The term “flight test” includes certification ground and flight tests as well as research activities. This order also applies to aircraft certification project applicants, other FAA Lines of Business (LOBs) involved in flight test activities, designated engineering representatives (DER), and organization designation authorization (ODA) holders in their conduct of FAA certification flight test activities.
- 3. Where I Can Find this Order.** This order can be accessed on the Web at: http://www.faa.gov/regulations_policies/orders_notices/.
- 4. Cancellation.** This order cancels FAA Order 4040.26B, *Aircraft Certification Service Flight Safety Program*, dated January 31, 2012.
- 5. Explanation of Changes.** This change includes significant revisions throughout the document due to the AIR realignment effected in 2017 and implementation of a safety management system (SMS) within the AIR Flight Test Program.
- 6. Organizational Structure, Roles, and Responsibilities.** The AIR flight test organization reports to the Director of the Aircraft Certification Service Compliance and Airworthiness Division (AIR-700), and supports aircraft certification activities across multiple divisions of the FAA’s Aircraft Certification Service. The organization has the majority of the flight test personnel under the AIR Flight Test Branch (AIR-710). The AIR-710 Manager is also the Flight Test Program Manager (FTPM). AIR Flight Test program crewmembers consist of Flight Test Pilots (FTPs) and Flight Test Engineers (FTEs). Personnel who are not part of the AIR Flight Test program may support the organization’s flight test activities. All AIR flight test personnel are accountable to the FTPM with regard to flight test activities. The Flight Test Branch consists of six regional sections throughout the country, each with two assigned Section Flight Safety Officers (SFSO). The Flight Safety Program is overseen by the Flight Test Program Flight Safety Officer (FTPFSO) who reports directly to the Flight Test Program Executive (FTPE), who is also

the Director of the Aircraft Certification Service Compliance and Airworthiness Division (AIR-700).

7. Flight Test Risk Management.

a. General. The AIR Flight Test Program's Risk Management (RM) program is implemented in accordance with FAA Order 8040.4, *Safety Risk Management*, and is an integral part of the AIR Flight Test Program's SMS. The RM program ensures that hazards are identified, eliminated, or their causes are sufficiently mitigated to an acceptable level. The AIR Flight Test Program RM process as described in Appendix C must be performed and documented for all ground and flight tests (such as certification, validation, familiarization, research flight activities, etc.) conducted under a Type Inspection Authorization (TIA) or Letter of Authorization (LOA). The RM process applies not just to certification flight tests flown by FAA flight test crews but also those that are delegated to DER test pilots and flight analysts, since they must follow applicable orders. In addition, this process applies when FAA certification flight tests are conducted by a delegated organization in accordance with a TIA. Applicants who will be conducting flight tests under an ODA must include in their ODA procedures manual a Flight Test RM process that complies with this order.

b. RM Procedures. The RM process and principles are detailed in Appendix C. Essentially it consists of three steps.

(1) Determine the Risk for the testing. This consists of the following steps:

- (a) Determine the tests to be performed.
- (b) Identify the hazards for those tests and consequences if the hazard occurs.
- (c) Estimate the probability of those hazards occurring.
- (d) Determine mitigations and emergency procedures for those hazards.

(e) Estimate the Risk level for the test based on the probability and consequence of the hazard occurring.

(2) Approve and document the RM plan. Management will approve the RM plan as adequate to eliminate or minimize the specific risk associated with planned testing. Test plan approval does not constitute RM plan approval. While the RM Plan may be included in a test plan or stand-alone document, the RM plan approval does not occur until TIA or LOA approval. RM must be documented within or attached to the TIA or applicable LOA. Appendices D and E contain examples of accepted RM documentation forms; however, other formats may be acceptable.

Approval Authority. RM approval/signature must be commensurate with the pre-mitigation risk level. A Flight Test Section Manager has the discretion to retain RM plan approval for all risk levels, however, the authority to sign an RM approval may be delegated as follows:

- Low Risk - The project pilot or project FTE.
- Medium Risk - An SFSO or another FAA test pilot or FTE not involved with developing the RM Plan. The test pilot or FTE flying the test shall not approve their own RM plan for Medium risk tests.
- High - A Flight Test Section Manager (If the manager is flying the test, then another Section manager or higher level AIR-710 manager can approve).

(3) Accept risk for flight test execution. Risk acceptance for FAA personnel is an inherent responsibility of FAA flight test managers. For FAA flight test crews participating in ground or flight testing, the FAA will document acceptance of the residual risk via a specific Letter of Authorization (LOA). An LOA template for both TIA and non-TIA flights is provided in Appendix E.

c. Requirements. Applicants who are regularly engaged in activities requiring FAA certification flight tests should be encouraged to develop an FAA-accepted RM process.

(1) Projects involving applicants with an FAA-accepted RM process.

(a) To be found acceptable by the cognizant FAA Flight Test organization, the applicant's RM process must comply, at a minimum, with the requirements of this order. The FAA should ensure that appropriate items of the FAA Flight Test Briefing Guide (Appendix B) are incorporated in company-developed briefing guides. Acceptance of an applicant's RM process must be formally documented (see Appendix F for an example).

(b) Order or company process changes: When changes to this order are made, previously accepted company RM processes should be reviewed to ensure they are still compliant with this order. If an applicant makes changes to their FAA-accepted RM process, then the applicant must forward the new process to the FAA to verify it still complies with this order.

(c) Project review. Acceptance of a company RM process does not relieve the FAA or an ODA of responsibility to review each project's risk assessment in order to evaluate the possibility of additional hazards and/or mitigations.

(d) Operations. In cases where flight testing is conducted with a company that has an accepted RM process, all AIR flight test crewmembers are expected to follow that company's process. Flight test managers and/or crews, however, always have the option to raise an issue with any flight test profiles, procedures, and/or limitations as necessary to satisfy FAA safety concerns. The FAA always has the option to halt testing if it is felt the tests are not being conducted safely. The approved risk level will dictate the level of review required to resume testing following settlement of the issue.

(2) Projects involving applicants without an FAA-accepted RM process. For those certification flight test projects where the applicant has no accepted RM process, the procedures specified in this order should be used to ensure proper RM. The RM process should be a collaborative effort between the applicant and the FAA.

d. References. In addition to the above-mentioned documents, the following resources are available when establishing a flight test risk management program:

- (1) Flight Test Safety Committee website (<http://www.flighttestsafety.org/>).
- (2) Flight Test Safety Database website (<https://ftsdb.grc.nasa.gov/>)
- (3) Society of Experimental Test Pilots (SETP) website (<https://www.setp.org/>)
- (4) Society of Flight Test Engineers (SFTE) website (<http://sfte.org/>)

(5) FAA Order 8000.369B, *Safety Management Systems*. (<https://drs.faa.gov/>), search for 8000.369B **Definitions**. The terms used within this order are defined in Appendix A.

8. Safety Event Reporting. AIR is dedicated to providing the highest level of safety while accomplishing all flight operations. A key element in promoting safety is sharing lessons learned and/or recommendations with all flight test personnel. Throughout AIR, flight test crewmembers must report not only accidents and incidents, but must also report Safety Significant Events (SSEs) in accordance with this order and the AIR Flight Test SMS. Below are details of the various reports.

a. SSE Report. The SSE report is the main reporting tool used to report all flight test safety events. An SSE is any flight test safety related event determined to be of significance to the flight test community. This includes accidents and incidents as defined in 49 CFR part 830, *Initial Notification of Aircraft Accidents, Incidents, and Overdue Aircraft*. It is also used to pass on any safety lessons learned for the flight test community. DERs, ODAs, and applicants with an FAA-accepted risk management process are strongly encouraged to submit SSEs in accordance with this order. To ensure all certification flight test personnel are kept informed of SSEs, DERs and ODAs are to report any SSE through the AIR flight test section responsible for their oversight. DERs and ODAs may use the AIR-710 SSE Report format (available from the SFSO), or a suitable alternate format mutually agreed upon between the SFSO and the DER/ODA. The primary focus of SSE reporting is to expeditiously raise awareness of a potentially unsafe condition, to restart the RM process (as required), document and disseminate critical safety information, and preclude a repeat occurrence. Personal and applicant identifying information will be removed to ensure the confidentiality of SSE submitters. Proprietary data cannot and will not be shared outside the FAA. In the interest of sharing safety data, the FAA should also share their SSE data with applicants. Events to be reported include:

- (1) Accidents or incidents as defined by 49 CFR part 830.
- (2) Ground or flight events whose outcome:
 - (a) Affected the safety of a crewmember and/or test participant.
 - (b) Exposed an increase from the assessed and approved level of risk.
 - (c) Was unexpected and developed, or could have developed, into an unsafe condition.

- (d) Resulted in aircraft damage.
- (e) Resulted in injury to personnel, damage to equipment or property, loss of material, or loss of use.
- (f) Produced lessons learned or recommendations which could be beneficial to the FAA and flight test community.

b. National Transportation Safety Board (NTSB) Reports. [49 CFR part 830](#) identifies unplanned or unexpected events that must be reported immediately to the NTSB. See 49 CFR part 830 for details of what data are required to be reported. If there is doubt as to “reportable,” a courtesy notification is prudent. Contact the NTSB Response Operations Center (<http://www.nts.gov>) and describe the event.

9. Accident Response Plan (ARP). All flight test operations must be conducted under an approved AIR ARP by Section or otherwise approved by AIR-710. The accident response plan reflects the pertinent steps to be taken by various office personnel in case of an accident involving FAA personnel. The accident response plan should be flexible enough to accommodate variations in the appropriate response. The plan should also account for variations in the organizational structure of the office or facility involved, and the resources available to those personnel tasked with implementing the response plan. In order to assure currency of contacts and procedures, a desktop exercise of the accident response plan must be performed annually and documented by memorandum to the FTPFSO.

10. FAA Personnel Participation in Flight Testing. Only qualified flight test crewmembers can participate in the full range of flight test activities conducted by the FAA. Qualified flight test crewmembers include FTPs, FTEs, and HF Specialists in the Flight Test Flight Program who are current in accordance with Flight Test Operations Manual (FTOM) requirements. These requirements include medical certification, physiological, survival, and specific flight test training. Only qualified flight test crewmembers may participate on high-risk tests as defined in this order. FAA personnel (AIR ASEs, technical specialists, etc.) who are not qualified Flight Test Program crewmembers may only participate on medium- and low-risk tests if all of the following requirements have been met:

- a. Clear justification for the participation of those personnel.
- b. For any flight conducted prior to completion of pressurization system certification requirements or where pressurization envelope may be a concern, those personnel must have completed physiological training, to include either altitude chamber or Portable Reduced Oxygen Training Enclosure.
- c. Hold at least an FAA Class III Medical certificate.
- d. All personnel participating in the flight must attend the preflight briefing, to include specific emphasis on emergency and egress procedures.

b. List of Potential Attendees for an SRB and reviewers for a Desktop RM Review

- RM Review chairperson (person(s) authorized to approve the level of risk identified for the testing)
- Project manager and/or project engineer
- Project flight test crew (FTP and FTE) and other flight test personnel who will be participating in the test
- Other flight test section representative(s) (if assigned project pilot or FTE are unavailable)
- FAA discipline engineers (propulsion, airframe, systems, etc.)
- Independent SMEs that may be outside observers with the appropriate experience to provide an independent review of safety issues
- Project manufacturing inspection district office (MIDO) or manufacturing inspection satellite office (MISO) specialist
- Applicant representative(s)
 - Main project POC
 - Applicant flight test personnel
- Flight Test Designees (when delegated)
- Project Aircraft Evaluation Division (AED) pilot, if appropriate
- SFSO

c. Blended PFTCB/SRB Agenda If a Blended PFTCB/SRB is proposed, the FAA Program Manager and SRB Chairperson should consider the following agenda:

(1) Program Overview (PFTCB) - Led by Program Manager

- Description of Modification
- Engineering Status
- Company Flight Test Data
- Design Maturity Review
 - System/Aircraft Safety Assessment (2X.1309)
 - Qualification testing
 - Iron bird/systems integration testing
 - Software testing
 - AEH testing

(2) Test Plan Review(PFTCB) - Led by flight test team

- Purpose and Objectives
- Method of Test
- Success Criteria
- Technical Go / No-Go Criteria
- Schedule

(3) Test Article (PFTCB) - Led by Program Manager

- Configuration
- Airworthiness Status

(4) Safety Review (SRB) - Led by SRB Chairperson

- Test Hazard Analysis Review
- Risk Assessment

Appendix I. Administrative Information

1. **Distribution.** This order is distributed to the branch level in AIR.
2. **Authority to Change This Order.** The issuance, revision, or cancellation of the material in this order is the responsibility of the AIR Compliance and Airworthiness Division (AIR-700).
3. **Suggestions for Improvements.** Please forward all comments on deficiencies, clarifications, or improvements regarding the contents of this order to:
 - a. The AIR Directives Management Officer at 9-AWA-AVS-AIR-DMO@faa.gov or
 - b. The FAA Directive Feedback System at <https://ksn2.faa.gov/avs/dfs/Pages/Home.aspx>.

Your suggestions are welcome. FAA Form 1320-19, *Directive Feedback Information*, is located in Appendix J of this order for your convenience.

4. **Records Management.** Refer to FAA Order 0000.1, *FAA Standard Subject Classification System*; FAA Order 1350.14, *Records Management*; or cognizant Records Management Officer (RMO)/Directives Management Officer (DMO) for guidance regarding retention or disposition of records.

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Appendix J. Directive Feedback Information

Please submit any written comments or recommendation for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: FAA Order 4040.26C, *Aircraft Certification Service Flight Test Risk Management*

To: 9-AWA-AVS-AIR-DMO@faa.gov or
complete the form online at <https://ksn2.faa.gov/avs/dfs/Pages/Home.aspx>

Please check all appropriate line items:

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows:

In a future change to this Order, please cover the following subject:
(Briefly describe what you want added.)

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____

Telephone Number: _____ Routing Symbol: _____

FAA Form 1320-19 (10-98)

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