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Standard Specification for Quality Assurance for Manufacturers of Aircraft Systems¹

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1. Scope

1.1 This specification establishes the minimum requirements for a Quality Assurance System (QAS) for manufacturers of an aircraft article(s) that is covered by the scope of Committee F39 on Aircraft Systems.

1.2 This specification applies to the manufacturing of aircraft articles or systems and provides information and describes criteria for establishing and maintaining a quality system.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Terminology

2.1 Definitions:

2.1.1 *article, n*—a material, part, component, process, or appliance.

2.1.2 *direct to stock (DTS), n*—parts that are accepted into inventory without inspection.

2.1.3 *manufacturer's statement of conformity, n*—a document certifying that the article meets the manufacturer's design requirements.

2.1.4 *quality assurance manual (QAM), n*—a document that provides an overview of the quality policies and key requirements of the QAS. The QAM is a basic source of reference and overview of the QAS.

2.1.5 *quality assurance record (QAR), n*—the record showing compliance with the QAS for each article produced.

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2.1.6 *quality assurance system (QAS), n*—a system of processes and controls used by a manufacturer to verify and validate that the article meets its specified requirement.

2.2 Abbreviations:

2.2.1 *DTS*—Direct to Stock

2.2.2 *MRB*—Material Review Board

2.2.3 *QA*—Quality Assurance

2.2.4 *QAA*—Quality Assurance Administration

3. Quality Assurance System

3.1 A QAS shall ensure that each process and service is performed in accordance with specifications containing definitive standards of quality. Manufacturers shall develop and implement a QAS in accordance with the requirements established within this specification. The elements of the QAS established herein include the following:

3.1.1 Quality Assurance Manual (QAM),

3.1.2 Document Control,

3.1.3 Product Configuration Control,

3.1.4 Supplier Control,

3.1.5 Product Change Management,

3.1.6 Calibration and Test Equipment,

3.1.7 Material Control,

3.1.8 Inspections,

3.1.9 Identification and Handling of Nonconforming Material,

3.1.10 Assignment of QA Duties,

3.1.11 Self Evaluation (Audit), and

3.1.12 Quality Assurance Record (QAR).

3.2 *Quality Assurance Manual (QAM)*—Each manufacturer shall document their QAS in the form of a QAM.

3.2.1 The QAM includes the quality policy and an overview of the key requirements contained in 3.1.2 through 3.1.12. It is the source of reference for all matters dealing with the QAS.

3.2.2 The manufacturer shall define the system and procedures for each key requirement of the QAS contained in 3.1.2 through 3.1.12. The key requirements of the QAS may be in separate documents or may be contained in a single document.

3.2.3 The QAM itself and each of the QAS elements included or referenced shall be controlled as production documentation in accordance with 6.6.

3.3 Quality Assurance Administration (QAA)—The manufacturer’s administration that is charged with the implementation of the QAS may consist of one or more employees, officials or manufacturer’s agents, consultants, or assigns.

3.3.1 The Accountable Executive is responsible for the quality of the product produced. These roles and responsibilities may be delegated. If Accountable Executive has been delegated, then **3.3.2 and 3.3.3** are required. These roles may be demonstrated in an org chart. The Accountable Executive is assumed to be owner/operator unless otherwise designated.

3.3.2 The title of the individual(s) who make up the QAA shall be identified within the QAM.

3.3.3 The manufacturer shall maintain a roster of the member(s) of the QAA authorized to attest final conformity of the article to the design.

4. Quality Assurance Record (QAR)

4.1 QARs are the record(s) necessary to show compliance with the organization’s QAS. The QAR includes (as applicable):

4.1.1 The records required by the QAS.

4.1.2 Individual article records shall consist of:

4.1.2.1 Completed final records and inspections from the manufacturing and assembly operations.

4.1.2.2 Test documentation from the production acceptance testing procedures. This includes items such as checklists or sign-off sheets showing acceptance and completion of applicable production acceptance test requirements, or both.

4.1.2.3 The configuration of each system at its point of delivery including associated parts lists and software, if applicable.

4.2 All QARs shall be kept for a minimum of three years beyond the date of sale.

4.2.1 The records required by **4.1.2.3** shall be retained for a minimum of five years.

5. Product Marking

5.1 The article shall be marked with manufacturer’s name, trademark, or symbol; and part number. If the part or article is too small or otherwise impractical to mark with any of the information required by this part, the manufacturer shall attach that information to the part or its container. If an article has a serial number or other serialized code, this shall be included in the part marking.

6. Engineering, Design, and Manufacture

6.1 During development and as required, manufacturer shall perform and record engineering design and development reviews.

6.2 Record of Compliance—The manufacturer shall keep a record of the documentation used to show compliance of each conforming aircraft articles or system produced to all applicable consensus standards and regulatory requirements in effect at the time of manufacture.

6.3 Configuration Control and Change Management:

6.3.1 Revisions to documentation affecting compliance shall be tracked and the change process for developing, reviewing, and incorporating revisions to compliance documentation shall be controlled.

6.3.2 The manufacturer must ensure and verify the use of the proper revision of any compliance document.

6.4 Production Documentation—The manufacturer shall maintain a record of all production documentation pertinent to product compliance, including revisions. Production documentation shall include the following types of documents:

6.4.1 Parts lists,

6.4.2 Component and assembly engineering drawings (engineering definition),

6.4.3 Manufacturing processes,

6.4.4 Work instructions,

6.4.5 Specifications,

6.4.6 Specialty tooling and gauge identification (including calibrated tools and test equipment), and

6.4.6.1 All items requiring calibration shall be calibrated annually or at manufacturer’s specified interval.

6.4.6.2 A policy shall be in place for action to be taken if calibrated equipment is found to be out of calibration.

6.4.7 Manufacturer’s statement of conformity, which is a document certifying that the supplied article meets the manufacturers design requirements.

6.5 A procedure shall be in place for nonconforming product, which includes addressing causes of nonconformity, action to eliminate nonconformity, and record of action taken.

6.6 All records required in Section 6 shall be retained for a minimum of five years.

NOTE 1—Any document or information necessary to show compliance to any section of any consensus standard is pertinent to product compliance and is intended to be documented and controlled as compliance/production documentation in accordance with Section 6.

7. Material Control

7.1 Material control procedures shall be established and documented to assure that materials, processes, and components, including raw materials, are in accordance with the manufacturer’s applicable specifications. The material control procedures shall include:

7.1.1 Procurement procedures to ensure that requirements for all items ordered are clearly specified.

7.1.2 Receiving procedures for incoming material and components.

7.1.3 Stock management procedures so that material in stock can be properly identified for future use.

7.1.4 For outsourced processes or manufacturing/fabrication, a supplier management procedure to verify that the work or item meets the manufacturer’s specifications.

7.1.5 A procedure for non-conforming materials disposition.

8. Inspections

8.1 Manufacturers shall implement and document a system of inspections to verify conformity of product to all applicable engineering requirements and production requirements.