



AEROSPACE STANDARD

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Technically equivalent writings exist in all IAQG sectors.

Superseding AS9101F

(R) Requirements for Conducting Audits of
Aviation, Space, and Defense Quality Management Systems

RATIONALE

This standard has been revised to align with the latest revision of the International Aerospace Quality Group (IAQG) 9104-1 standard, incorporating inputs received from interested parties, standard clarifications, and Other Party Management Team (OPMT) resolutions.

FOREWORD

Industry established the IAQG, with representatives from Aviation, Space, and Defense (ASD) companies in the Americas, Asia/Pacific, and Europe, to implement initiatives that make significant improvements in quality and reductions in cost throughout the value stream.

This document has been prepared by the IAQG and standardizes the requirements for conducting audits of ASD Quality Management Systems (QMS). It can be used at all levels of the supply chain by organizations around the world.

This document supplements the existing International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17021-1 conformity assessment standard and provides requirements for an audit and reporting process, based on the:

- Process and continual improvement approach defined in 9100-series standards;
- Specific ASD additions in 9100-series standards;
- Use of common audit tools; and
- Uniform, transparent, and standardized reporting of audit results.

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Documents

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In this standard, the following terms are used:

- “Shall” indicates a requirement;
- “Should” indicates a recommendation;
- “May” indicates a permission;
- “Can” indicates a possibility or capability; and
- “Days” are calendar days.

Words “example” or “e.g.” indicate suggestions given for guidance, and information marked “NOTE” is for guidance in understanding or clarifying the associated requirement.

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INTRODUCTION

0.1 General

Auditing is a basic tool to assess effective implementation of and conformity to QMS requirements. In addition to assessing conformity, this standard focuses on the evaluation of effectiveness (refer to ISO 9000 clause 3.7.11) of the QMS and its associated processes.

An organization is not only required to be in conformity with QMS requirements, but to be effective in meeting customer expectations and delivering products and services that meet those expectations.

0.2 Auditing Approach

This standard supports the engagement and evaluation of an organization's QMS process approach, as required by the 9100-series standards. When evaluating an organization's QMS, there are basic questions that should be asked of every process, for example:

- a. Is the process appropriately determined?
- b. Are responsibilities assigned?
- c. Are the processes adequately implemented and maintained?
- d. Is the process effective in achieving the desired results?

The collective answers to these and other associated questions will contribute to the evaluation results.

In addition, product and service quality (as delivered), customer satisfaction, and QMS effectiveness can be considered as interrelated. This relationship should be reflected in the audit process and associated results.

0.3 Audit Documented Information

This standard defines the documented information to be generated, during the audit process. The documented information is critical in providing the organization and its customers with objective evidence on the conformity and effectiveness of the QMS (including process effectiveness), and reporting the audit results in a standard format/structure.

AUDIT REQUIREMENTS

1. SCOPE

1.1 General

This standard defines requirements for the preparation and execution of the audit process. In addition, it defines the content and composition for the audit reporting of conformity and process effectiveness to the 9100-series standards, the organization's QMS documentation, and customer and statutory/regulatory requirements.

The requirements in this standard are additions or represent changes to the requirements and guidelines in the standards for conformity assessment, auditing, and certification as published by ISO/IEC (i.e., ISO/IEC 17000, ISO/IEC 17021-1). When there is conflict with these standards, the requirements of the 9101 standard shall take precedence.

NOTE 1: In this standard, the term “9100-series standards” comprises of the 9100, 9110, and 9120 standards; developed by the IAQG and published by various national standards bodies.

NOTE 2: In addition to this standard, the IAQG publishes deployment support material on the IAQG website (see <http://www.iaqg.org>) that can be used by audit teams, when executing the audit process.

1.2 Application

This standard shall be used for audits of 9100-series standards by Certification Bodies (CBs) for certification of organizations, under the auspices of the ASD industry certification scheme [also known as the Industry Controlled Other Party (ICOP) scheme]. The ICOP scheme requirements are defined in the 9104-series standards (i.e., 9104-1, 9104-2, 9104-3).

NOTE: Relevant parts of this standard can also be used by an organization in support of internal audits (1st party) and external audits at suppliers (2nd party).

2. REFERENCES

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or resolutions) applies. When a conflict in requirements between this document and the referenced standards exist, the requirements of this document shall take precedence.

9100*	Quality Management Systems – Requirements for Aviation, Space, and Defense Organizations
9110*	Quality Management Systems – Requirements for Aviation Maintenance Organizations
9120*	Quality Management Systems – Requirements for Aviation, Space, and Defense Distributors
9104-1*	Requirements for Certification of Aviation, Space, and Defense Quality Management Systems
9104-2*	Requirements for the Oversight of Aerospace Quality Management System Registration/Certification Programs
9104-3*	Requirements for Aviation, Space, and Defense Auditor Training, Development, Competence, and Authentication

IAQG Procedure 105.6IAQG Forms Management

*As developed under the auspice of the IAQG and published by various standards bodies [e.g., AeroSpace and Defense Industries Association of Europe – Standardization (ASD-STAN), SAE International, European Committee for Standardization (CEN), Japanese Standards Association (JSA)/Society of Japanese Aerospace Companies (SJAC), Brazilian Association for Technical Norms (ABNT)].

ISO 9000:2015 Quality management systems – Fundamentals and vocabulary

ISO/IEC 17000:2020 Conformity assessment – Vocabulary and general principles

ISO/IEC 17021-1:2015 Conformity assessment – Requirements for bodies providing audit and certification of management systems – Part 1: Requirements

3. TERMS AND DEFINITIONS

Definitions for general terms can be found in ISO 9000, ISO/IEC 17000, 9100-series, 9104-series, and the IAQG International Dictionary (located on the IAQG website). An acronym log for this document is presented in Appendix A. For the purpose of this standard, the following definitions apply:

3.1 Containment

Action to control and mitigate the impact of a nonconformity to protect the customer, organization, or product (i.e., stop the problem from getting worse); includes immediate action, immediate communication, and verification to ensure that the nonconforming situation does not further degrade.

3.2 Key Performance Indicator (KPI)

Measures associated with goals or targets showing how well an organization is achieving its objectives or critical success factors. KPIs are used to objectively define a quantifiable and measurable indication of performance.

3.3 Major Nonconformity

The requirements of ISO/IEC 17021-1 clause 3.12 shall apply.

In addition, a major nonconformity can be one or more of the following situations:

- A nonconformity where the effect is judged to be detrimental to the integrity or safe use of the product or service;
- The absence of or total breakdown of a system to meet a 9100-series standard requirement, a customer QMS requirement, or documented information defined by the organization;
- Any nonconformity that can result in the probable delivery of nonconforming product or service; and
- A condition that can result in the failure or reduce the usability of the product or service for its intended purpose.

3.4 Minor Nonconformity

The requirements of ISO/IEC 17021-1 clause 3.13 shall apply.

In addition, a minor nonconformity can be a single system failure or lapse in conformity to meet a 9100-series standard requirement, customer QMS requirement, or documented information defined by the organization.

3.5 Nonconformity Report (NCR)

A document that provides details of the nonconformity, organization's planned actions, and auditor verification/closure (see Form 4).

3.6 Planned Activities

The criteria and methods by which the organization plans to achieve the intended results of, and conformity to, a given process to meet requirements.

3.7 Planned Results

The intended performance of a process as determined and measured by the organization. Performance measures include product/service conformity and On-time Delivery (OTD), and may include other measures related to the process defined by the organization.

3.8 Process Effectiveness Assessment Report (PEAR)

A document that provides details of a given process, process results, process realization, and the level of process effectiveness (see Form 3).

3.9 Repeat Nonconformity

A trend of identical nonconformities reported against the same requirement, indicating that previous corrective action attempt(s) failed to prevent recurrence of the nonconforming situation.

4. AUDITING AND REPORTING

4.1 General

4.1.1 The audit and reporting process established to assess conformity, including the determination of QMS effectiveness to the 9100-series standards, shall meet the requirements of ISO/IEC 17021-1, as stated in each relevant clause of this standard.

4.1.2 For Integrated Management System (IMS) audits, the requirements of 9104-1 clause 8.5.2 apply.

4.1.3 The audit program and associated activities (see 4.2) shall be followed when auditing and certifying organizations to 9100-series standards in the ASD industry.

4.1.4 The audit process requirements consist of three main parts:

- a. The phases of the audit process (see 4.2.1);
- b. The common audit activities (see Section 5) used to support each audit phase; and
- c. The specific requirements for each audit phase (see Section 6).

4.2 Audit Program

4.2.1 The audit program consists of the following phases:

- a. Pre-audit activities (see 6.2);
- b. Stage 1 audit (see 6.3);
- c. Stage 2 audit (see 6.4);
- d. Surveillance audit (see 6.5); and
- e. Recertification audit (see 6.6).

4.2.2 Pre-audit activities and Stage 1/Stage 2 audits are applicable for initial certification. A Stage 1 audit can also be utilized for recertification audits and during CB transfer.

NOTE 1: Although 'Special Audit' is not listed as a part of the audit program, it can be applicable after initial certification, when directed by special request. The requirements for special audits are defined in 6.7.

NOTE 2: The requirements for certification are defined by the 9104-1 standard.

4.3 Audit Reporting

4.3.1 Audit reporting requirements are defined in Table 1.

Table 1 - Audit reporting requirements

Audit Report(s) \ Audit Phase	Stage 1 (see 6.3)	Stage 2 (see 6.4)	Surveillance (see 6.5)	Recertification (see 6.6)	Special (see 6.7)
Stage 1 Audit Report (see Form 1)	Required				
QMS Process Matrix Report (see Form 2)		Required; per site or combined, as appropriate (see 4.3.3)			See 4.3.2
Process Effectiveness Assessment Report (PEAR) (see Form 3)					
Nonconformity Report (NCR) (see Form 4)		Required (as applicable)			
Audit Report (see Form 5)		Required			

4.3.2 A QMS Process Matrix Report (see Form 2) and PEAR (see Form 3) shall be issued dependent upon the reason for the special audit, as defined in Table 2.

4.3.3 Recording of process information may be combined into a single PEAR and QMS Process Matrix Report for multi-site organizations, provided that the process is common across the sites. Information recorded shall reflect each site included in the PEAR and QMS Process Matrix Report. The process effectiveness level shall reflect the lowest single value of the various sites assessed.

4.3.4 All audit reporting, defined within this standard, shall be managed electronically within the Online Aerospace Supplier Information System (OASIS) database, including the audit reports defined in Table 1.

NOTE: In accordance with IAQG Procedure 105.6, representations of the 9101 forms are presented in Appendix B for reference only. These forms and supporting instructions are accessible via the IAQG website.

Table 2 - Special audit reporting requirements

Reason for Special Audit	QMS Process Matrix Report (see Form 2)	Process Effectiveness Assessment Report (PEAR) (see Form 3)
Transferring certification from one CB to another	Not required	
Reducing an organization's certification scope, or number of sites and/or locations		
Verification of evidence to support application of Performance Based Surveillance/Recertification Process (PBS/RP)		
Change to an organization's certification structure	Required	Required, if special audit activity is conducted against 9100-series standard clause 8
Investigate a complaint or serious issue		
Follow up from an organization's suspension		
Expanding an organization's certification scope, or number of sites and/or locations		

5. COMMON AUDIT ACTIVITIES

5.1 General

5.1.1 Common audit activities shall be undertaken for each phase of the audit program as defined in Table 3.

5.1.2 Stage 1, Stage 2, surveillance, and recertification audit activities shall be described in the audit program established during the 'Pre-audit Activities' phase (see 6.2).

5.2 Audit Planning

5.2.1 The requirements of ISO/IEC 17021-1 clause 9.2 shall apply.

5.2.2 Audit teams shall plan audits in accordance with 9104-1 clause 8.5.5.

5.2.3 Process names shall be consistent in the audit plan, QMS Process Matrix Report (see Form 2), and PEAR (see Form 3) and shall correspond to the process names defined by the organization.

5.2.4 The audit team leader shall use the organization's customer feedback requests, including those received through the OASIS database (see 9104-1 clause 8.5.12), to assist with audit planning for surveillance and recertification audits, and special audits (when appropriate).