



AEROSPACE STANDARD

AS13100™**REV. A**Issued 2021-03
Revised 2025-04

Superseding AS13100

(R) AESQ Quality Management System Requirements
for Aero Engine Design and Production Organizations

RATIONALE

This standard has been revised to update requirements, document structure, and clear up ambiguity. Additional changes to the definitions, tables, and associated notes were incorporated in response to stakeholder inputs.

FOREWORD

To assure customer satisfaction, the aviation, space, and defense industry organizations have to produce and continually improve safe, reliable products that equal or exceed customer and regulatory authority requirements.

The globalization of the industry and the resulting diversity of regional/national requirements and expectations have complicated this objective. End-product organizations face the challenge of assuring the quality of and integration of product purchased from suppliers throughout the world and at all levels within the supply chain. Industry suppliers face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

The SAE G-22 Aerospace Engine Supplier Quality (AESQ) Technical Committee was established under the SAE Aerospace Council to develop, specify, maintain, and promote quality standards relating to the aerospace engine supply chain. The principles defined within this standard may be applicable to other segments of the aviation, space, and defense industries.

The AESQ strategy is to promote defect prevention approaches across the supply chain including those associated with advanced product quality planning and process control to enable the supply chain to achieve zero defects.

INTRODUCTION

For an overview of the linkage between AS13100 and other industry standards, [Figure A1](#) shows the relationship between the current quality management system (QMS) standards and AS13100. It can be noted that 9100 follows the structure of ISO 9001 and adds its own industry specific supplemental requirements.

AS13100 now does the same by building on the elements of 9100 and 9145 to add the aero engine manufacturers' specific requirements that are not covered in the other standards.

To help demonstrate the alignment with these standards the AS13100 supplemental requirements follow the same numbering sequence (clause numbers; see [Figure 1](#)) as 9100 in [AS13100 - Chapter A](#) and 9145 in [AS13100 - Chapter B](#).

When there is a supplemental requirement to 9100 or 9145 in this document, the 9100 or 9145 clause number and title is listed.

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Management Standards		Clause Numbers									
ISO9001	Any Industry Quality Management Standard	1	2	3	4	5	6	7	8	9	10

9100	Aviation, Space and Defense Industry Quality Management Standard	1	2	3	4	5	6	7	8	9	10
		Defines supplementary requirements to ISO9001. ISO 9001 requirements are included within 9100 in full.									

9145	APQP / PPAP Standard for Aviation, Space and Defense Industry		Clause Numbers						
			0.1	0.2	1	2	3	4	5

AS13100	Aero Engine Quality Management System Standard	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
		Defines supplementary requirements to 9100 and/or ISO9001										Defines supplementary requirements to 9145						

Figure 1 - AS13100 standard relationship to other quality management system standards

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1. SCOPE

This SAE Aerospace Standard (AS) establishes supplemental requirements for 9100 and 9145 and applies to any organization receiving it as part of a purchase order or other contractual document from a customer.

AS13100 also provides details of the reference materials (RM13xxx) developed by the SAE G-22 AESQ committee and listed in [Section 2](#) that can also be used by organizations in conjunction with this standard.

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS5553	Counterfeit Electrical, Electronic, and Electromechanical (EEE) Parts; Avoidance, Detection, Mitigation, and Disposition
AS6174	Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel
AS9100*	Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations
AS9102*	Aerospace Series - First Article Inspection Requirements
AS9103*	Aerospace Series - Quality Management Systems - Variation Management of Key Characteristics
AS9115*	Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations - Deliverable Software (Supplement to 9100:2016)
AS9116*	Aerospace Series - Notice of Changes (NOC)
AS9117*	Delegated Product Release Verification
AS9120*	Quality Management Systems - Requirements for Aviation, Space, and Defense Distributors
AS9145*	Aerospace Series - Requirements for Advanced Product Quality Planning and Production Part Approval Process
AS9146*	Foreign Object Damage (FOD) Prevention Program - Requirements for Aviation, Space, and Defense Organizations
AS9162*	Aerospace Operator Self-Verification Programs
AS13001	Delegated Product Release Verification Training Requirements

NOTE: *Internationally harmonized standards developed under the authority of the IAQG and listed here as SAE International AS publications. Equivalent versions may be published by other standards bodies (e.g., European Committee for Standardization [CEN], Japanese Standards Association/Society of Japanese Aerospace companies [JSA/SJAC]).

2.2 AESQ Publications

The AESQ reference manuals have been created to support the requirements of AS13100 by providing examples of preferred means of compliance. These documents provide methodologies, templates, and case studies of the application of key processes required by the standard.

Copies of RM13xxx documents are available online at <https://aesq.sae-itc.com/supplemental-material>.

RM13000	Problem Solving Methods including 8D
RM13002	Alternate Strategies to 100% Inspection
RM13003	Measurement Systems Analysis (MSA)
RM13004	Defect Prevention Quality Tools to support Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP)
RM13005	Quality Audit Methods
RM13006	Process Control Methods
RM13007	Sub-tier Management
RM13008	Design Work
RM13009	AS13100 Compliance Matrix
RM13010	Human Factors
RM13011	Managing Rework and Production Repair
RM13102	First Article Inspection Requirements (FAIR)
RM13145	Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP)

2.3 ISO Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ISO 9001	Quality Management Systems - Requirements
ISO 31000	Risk Management - Guidelines
ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories

2.4 EASA Publications

Available from European Union Aviation Safety Agency, Konrad-Adenauer-Ufer 3, D-50668 Cologne, Germany, Tel: +49 221 8999 000, www.easa.europa.eu.

CS-E515	EASA Certification Specification - Engine Critical Parts
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2.5 VDA/EN Publications

Copies of these documents are available online at <https://www.en-standard.eu/>.

VDA 6.3	Quality Management - Automotive Industry - Process Audit
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3. TERMS AND DEFINITIONS

3.1 Background

In this SAE Aerospace Standard (AS), the following verbal forms are used:

- “Shall” indicates a requirement.
- “Should” indicates a recommendation.
- “May” indicates a permission.
- “Can” indicates a possibility, or a capability.

Information marked as “NOTE:” is for guidance in understanding or clarifying the associated requirement.

A list of acronyms has been provided (see [Appendix C](#)).

3.2 Terms and Definitions

For the purpose of this standard, the terms and definitions apply as documented in the AESQ Quality Dictionary available on the AESQ website: <https://aesq.sae-itc.com/supplemental-material>.

AS13100 - Chapter A
9100 Quality Management Systems - Requirements for Aviation, Space, and Defense
Organizations - AESQ Supplemental Requirements

4. CONTEXT OF ORGANIZATION

4.1 Understanding the Organization and Its Context

4.2 Understanding the Needs and Expectations of Interested Parties

4.2.1 Understanding the Needs and Expectations of Interested Parties - Supplemental Requirements

4.2.1.1 The organization shall ensure on-site right of entry to its customers and their respective governmental and regulatory agencies, third parties mandated by the customer and contracting parties accompanying the customer's representatives including access to documented information and the ability to conduct audits, review of quality investigations, and to verify product and processes.

4.2.1.1.1 Right of entry includes access to the applicable areas of organization facilities as well as related supplier and business partner facilities.

4.2.1.2 Where access is restricted due to export control technical requirements or organization intellectual property concerns, the organization shall facilitate to allow the customer or regulatory agency to fulfill their mandate.

4.2.1.3 Where required, the organization shall provide language translation capabilities to support such reviews.

4.3 Determining the Scope of the Quality Management System

4.3.1 Determining the Scope of the Quality Management System - Supplemental Requirements

4.3.1.1 [Table 1](#) contains the minimum requirements per organization type and shall be complied with in conjunction with additional customer requirements. It shows the applicability of the AS13100 Standard clauses to the organization's scope of approval.

4.3.1.2 [Table 1](#) takes into consideration the certification requirements in [Table 2](#). The organization shall ensure that the applicable requirements of this standard are included within their QMS.

4.3.1.3 Any significant changes shall be communicated to the customer.

4.3.1.4 For "production shop assist only" organizations, the applicable elements of AS13100 requirements shall be as defined by the customer, based upon the scope of the work undertaken.

4.3.1.5 For organization types not listed in [Table 1](#), refer to specific customer requirements.

4.3.1.6 The flowcharts can be used to illustrate how the requirements of this standard apply to the different organization types defined in [Table 1](#) of this standard; see [Figures B1](#) (hardware providers) and [B2](#) (service providers).

4.3.1.7 For the organization types and how the requirements of this standard apply, see [Tables 1](#) and [B1](#).

4.3.1.8 The flowcharts (see [Figures B1](#) and [B2](#)) can also be used by supplier (sub-tier) where AS13100 is a contractual flow down.

Table 1 - AS13100 supplemental requirements applicability

AS13100 Paragraph Reference	Organization Type					
	Type 1: Make to Print	Type 2a: Design and Manufacture	Type 2b: Design Only	Type 3: Distributor	Type 4: Special Process	Type 5: Raw Material
4.2.1	X	X	X	X	X	X
4.3.1	X	X	X	X	X	X
4.3.2	X	X	X			
4.3.3-4.3.5	X	X	X	X	X	X
4.4.3	X	X	X	X	X	X
5.1.1.1	X	X	X	X	X	X
5.2.1.1	X	X	X	X	X	X
5.3.1	X	X	X	X	X	X
6.1.3	X	X	X	X	X	X
7.1.3.1	X	X	X	X	X	X
7.1.5.1.1- 7.1.5.1.5	X	X			X	
7.2.1	X	X	X	X	X	X
7.2.2	X	X	X	X	X	X
7.2.3	X	X		X	X	X
7.2.4	X	X	X	X	X	X
7.3.1	X	X	X	X	X	X
7.5.2.1	X	X	X	X	X	X
7.5.3.3	X	X	X	X	X	X
7.5.3.4		X	X			
7.5.3.5	X	X	X	X	X	X
8.1.3.1	X	X	X	X	X	X
8.1.4.1	X	X		X	X	X
8.2.1.1	X	X	X	X	X	X
8.2.2.1	X	X	X	X	X	X
8.2.3.3	X	X	X	X	X	X
8.3.1.1-8.3.6.1		X	X			
8.4.1.2-8.4.1.3	X	X			X	
8.4.1.4	X	X		X	X	
8.4.2.1	X	X	X	X	X	X
8.4.2.2-8.4.2.4	X	X		X	X	X
8.4.2.5	X	X			X	X
8.4.2.6	X	X		X	X	X
8.4.3.1	X	X		X	X	X
8.5.1.1.1	X	X			X	X
8.5.1.2.1	X	X	X		X	X
8.5.1.4	X	X			X	X
8.5.1.5	X	X	X		X	
8.5.1.6	X	X				



AS13100 Paragraph Reference	Organization Type					
	Type 1: Make to Print	Type 2a: Design and Manufacture	Type 2b: Design Only	Type 3: Distributor	Type 4: Special Process	Type 5: Raw Material
8.5.1.7	X	X			X	
8.5.1.8	X	X			X	X
8.5.1.9	X	X		X	X	X
8.5.2.1	X	X				X
8.5.4.1	X	X		X	X	X
8.5.6.1	X	X	X		X	X
8.6.1	X	X			X	X
8.7.1.1	X	X			X	X
9.1.1.1-9.1.1.3	X	X			X	X
9.1.2.1	X	X	X	X	X	X
9.2.3-9.2.4	X	X	X	X	X	X
9.3.2.1	X	X	X	X	X	X
9.3.3.1	X	X	X	X	X	X
10.2	X	X	X	X	X	X
10.2.4	X	X	X	X	X	X
10.3.1	X	X		X	X	X

- 4.3.2 Organizations whose products are deliverable software, or contain deliverable software, shall comply with 9115 when planning and evaluating the software design, development, or management activities of the organization.
- 4.3.3 The organization shall be certified by an industry recognized and accredited QMS certification body for the associated scope(s) of work in accordance with [Table 2](#).
- 4.3.3.1 The organization shall cascade these certification requirements to its suppliers in accordance with [Table 2](#).
- 4.3.3.2 For Nadcap certifications, the accreditation is administered by the Performance Review Institute (PRI).
- 4.3.4 The organization shall provide access to relevant data within Online Aerospace Supplier Information System (OASIS) and provide data from the Nadcap databases (e.g., registration documentation, certification, audit reports and findings, corrective actions) to its customers.
- 4.3.5 The organization shall conduct an AS13100 compliance self-assessment to ensure that the scope of its management system includes the full scope of this standard; refer to RM13009 for recommendations on how to complete a compliance self-assessment.
- 4.3.5.1 The AS13100 compliance self-assessment review shall be reviewed at a minimum annually and updated as applicable and provided to the customer on request (refer to RM13009).
- 4.3.5.2 The organization shall identify any compliance gaps that they are unable to address and bring these to the attention of the customer for resolution.

Table 2 - QMS certification requirements

Organization Type	QMS Approval (Minimum Requirement)
Type 1: Make to print Type 2A: Design and manufacture Manufacture, inspect, test, and certify the conformance of semi-finished and/or finished products (installed on aerospace engines or a component of such a product) to proprietary engineering drawings whether customer design, or organization design. Includes castings and forgings produced to a proprietary design.	9100 registration.
Type 2B: Design only Contracted design responsible organization/partner/supplier tasks organizations.	As defined by customer's requirements.
Type 3: Distributor	9120 registration.
Type 4: Special process As part of an organization's manufacturing scope and/or special process houses.	Nadcap or customer's requirements.
Type 5: Raw material Manufacture, inspect, test, and certify the conformance of raw material to proprietary engineering specifications.	ISO 9001 registration or customer requirements.
Production shop assist only. Offload of planned manufacturing operations.	Customer defines requirements
External calibration or laboratory service provider.	ISO/IEC 17025, or the standards are traceable to national standards, e.g., UKAS, COFRAC, NIST.

4.4 Quality Management System and Its Processes

4.4.3 Quality Management System and Its Processes - Supplemental Requirements

4.4.3.1 The organization's QMS shall include management of human factors in its processes (see [5.1.1.1](#)) including:

- a. Training of employees.
- b. An open reporting culture, encouraging the sharing of mistakes without fear of retribution.
- c. Considering human factors in investigations.
- d. Considering human factors in the reporting of performance and identifying improvement plans.

4.4.3.2 Consideration of human factors shall be included in product and service design, manufacturing/assembly, and product servicing.

NOTE: For details on the deployment of human factors within the organization, refer to RM13010.

5. LEADERSHIP

5.1 Leadership and Commitment

5.1.1 General

5.1.1.1 General - Supplemental Requirements

Top management shall demonstrate a commitment to human factors in accordance with [4.4.3](#) and [7.3.1](#); refer to RM13010.

5.2 Policy

5.2.1 Establishing the Quality Policy

5.2.1.1 Establishing the Quality Policy - Supplemental Requirements

5.2.1.1.1 The organization shall have a policy that includes human factors which promotes:

- a. Open reporting.
- b. Continually improving the maturity of human factor deployment within the organization.

5.3 Organizational Roles, Responsibilities, and Authorities

5.3.1 Organizational Roles, Responsibilities, and Authorities - Supplemental Requirements

5.3.1.1 Personnel responsible for conformity to product requirements shall have the authority to stop and correct quality problems.

5.3.1.2 Where the process design prevents immediate shutdown upon detection of a quality problem, then the product or service shall be contained so that it is prevented from being delivered to the customer.

6. PLANNING

6.1 Actions to Address Risks and Opportunities

6.1.3 Actions to Address Risks and Opportunities - Supplemental Requirements

6.1.3.1 The organization shall implement a risk management process, e.g., ISO 31000, across their organization and ensure they:

- a. Carry out a robust assessment of risks, in particular those that could threaten future performance, and detail these in a risk register.
- b. Carry out a review of the effectiveness of their risk management system (including internal controls), at least annually.
- c. Ensure appropriate risk mitigation is in place (including internal controls) that is appropriate to the risks identified.

6.1.3.2 The organization shall establish a crisis management and business continuity plan and inform its customer purchasing representative within 3 working days of becoming aware of an issue regarding the following:

- a. Major incidents affecting the organization that impact the organization's ability to meet customer commitments.
- b. Risks that could impact the continuity of the organization's business/operations, particularly single points of failure.
- c. Changes to QMS certification, including lapse/withdrawal/major audit findings to the relevant customer.
- d. Change of the nominated quality representative (usually the most senior quality leader within the organization).
- e. Significant change to the QMS.
- f. Change in ownership or discontinuation of business activities.
- g. Significant issues of breaches of information technology (IT) security systems (cyber security).
- h. Risks with the supply of materials used in the production or physical make-up of products, due to laws and regulations concerning the control or use of such materials.

7. SUPPORT

7.1 Resources

7.1.3 Infrastructure

7.1.3.1 Plant, Facility, and Equipment - Supplemental Requirements

7.1.3.1.1 The organization shall use a cross-functional approach to develop project plans when implementing a new plant, facilities, or equipment.

7.1.5 Monitoring and Measuring Resources

7.1.5.1 General

7.1.5.1.1 Measurement Systems Analysis (MSA) - Supplemental Requirements

7.1.5.1.1.1 MSA guidance is available (refer to RM13003) and should be applied in conjunction with the requirements defined in this section. The organization shall obtain customer approval for equivalent methods; refer to RM13003.

7.1.5.1.1.2 The organization shall assess when to apply MSA in accordance with [Table 3](#) and provide justification when MSA is not applied.

7.1.5.1.1.3 All MSA studies shall be conducted under production conditions or equivalent (see [7.1.5.1.2](#)).

7.1.5.1.1.4 MSA is required for KCs on all Events as described in [Table 3](#). Applicability of MSA for KCs is applied independently from the classification due to the importance of KCs.

NOTE: For MSAs, apply [Table 4](#) acceptance criteria, based on KC classification of critical, major, or minor.

Table 3 - When to apply measurement capability assessment

Event	Event Description	Requirement per Characteristic Classification				Action
		KC	Critical	Major	Minor	
1	New product or characteristic	Required	Required	Required	Recommended	Perform MSA
2	New verification device or method.	Required	Required	Required	Recommended	Perform MSA
3	Any significant change to the current verification method.	Required	Required	Required	Recommended	Evaluate existing MSA and/or perform a new MSA
4	Following a product quality escape or audit finding suspected to be from the verification system.	Required	Required	Recommended	Recommended	Evaluate existing MSA and/or perform a new MSA
5	Product requirements changed (e.g., specification limit[s] changed, KC).	Required	Required	Recommended	Recommended	Evaluate current MSA
6	As part of a FAI following a lapse in use.	Required	Recommended	Recommended	Recommended	Evaluate current MSA
7	If a process monitoring method is promoted to product acceptance method.	Required	Required	Required	Recommended	Perform MSA
8	To verify a verification system meets requirements from Table 4 before applying Alternate Strategies to 100% Inspection (see 9.1.1.2).*	Required	Required	Required	Recommended	Evaluate existing MSA and/or perform a new MSA *Requirement of MSA, does not supersede any requirements in 9.1.1.2 .
9	New computer driven measurement system (CDMS) part program.	Required	Required	Required	Required	Perform CDMS study
10	Revision to computer driven measurement system (CDMS) part program	Required	Required	Required	Required	Evaluate current or perform CDMS study. Refer to RM13003 for more details.

Note: "Evaluate current or perform" is defined as reviewing any existing MSA studies to ensure it meets the requirements of this standard. Capturing additional data, rerunning the calculation on new data, applying new tolerances, or performing a new MSA study to prove the measurement system capable.

7.1.5.1.2 Conduct MSA as Planned - Supplemental Requirements

7.1.5.1.2.1 The following MSA requirements shall be met (refer to RM13003):

- a. Ensure that the personnel assigned to perform product verification activities are trained and competent in the use of the monitoring/measuring equipment.
- b. Ensure MSA tests align to industry-recognized techniques.
- c. The MSA study must follow the planned production process, and where this includes part constraint that must be included in the study.
- d. Ensure production parts, representative parts, or artifacts that represent the manufacturing process, tolerances, and dimensions are used.
- e. Ensure personnel, resources, and environment replicate the conditions in the production process and during the trial personnel do not have visibility of study results.

7.1.5.1.3 Confirm Acceptance - Supplemental Requirements

7.1.5.1.3.1 The organization shall have objective evidence to demonstrate compliance to [Table 4](#).

7.1.5.1.3.2 Use the flow diagram in RM13003 to clarify which tests are required to form a complete MSA submission.

7.1.5.1.3.3 When MSA results fail to meet the requirements in [Table 4](#), mitigation action shall be initiated to improve the measurement system. Where improvement is not practical, a containment plan that assures product conformity shall be documented and approved by the customer.

NOTE: RM13003 provides examples of mitigation action.

7.1.5.1.3.4 Customer requirements may override the values.

7.1.5.1.3.5 Where characteristic classification is unknown, assume “major” column for acceptance criteria, unless noted otherwise by the customer.

7.1.5.1.3.6 As a default, all calculations use ± 3 standard deviations (99.7% confidence). Deviations from this shall be documented and approved by customer.

7.1.5.1.3.7 For MSAs, apply [Table 4](#) acceptance criteria for KCs based on characteristic category of critical, major, or minor.

Table 4 - MSA acceptance limits

MEASUREMENT PROCESS PROPERTY		CHARACTERISTIC CATEGORY			COMMENTS
		CRITICAL	MAJOR	MINOR	
Continuous Measurement Systems - Gauge Selection	Resolution	$\leq 10\%$ of total tolerance			
	Accuracy ratio or percent	$\geq 10:1$ or $\leq 10\%$		$\geq 4:1$ or $\leq 25\%$	
Continuous Measurement Systems Analysis	Bias	$\leq 10\%$ of total tolerance			Tolerance of less than 0.05 mm are difficult to achieve; refer to RM13003 for risk mitigation.
	Repeatability (Type 1 Gauge)	$\leq 10\%$ of tolerance	$\leq 20\%$ of tolerance	$\leq 30\%$ of tolerance	Requires Customer Approval; refer to RM13003 for detail.
	Gauge Repeatability & Reproducibility (GR&R)	$\leq 10\%$ of tolerance	$\leq 20\%$ of tolerance	$\leq 30\%$ of tolerance	Required for approval unless using CDMS.
	CDMS Study (GR&R)	$\leq 10\%$ of tolerance		$\leq 20\%$ of tolerance	Used for CMM, 3D structured light, vision systems, X-Ray, etc. See above for Bias.
	Linearity	$\leq 1\%$ of total tolerance			
Attribute study: pass/fail	Overall Kappa	≥ 0.8			All appraisers agreed within and between themselves.
	Appraiser consistency	$\geq 90\%$			Appraiser agrees with himself.
	Appraiser to Appraiser	$\geq 80\%$			Appraisers between each other.
	Appraiser to Standard	$\leq 25\%$ False Fail (failing a good part) $\leq 5\%$ False Pass (passing a bad part)			For each appraiser, compare appraiser to the reference and separation between good and bad parts.
Attribute study: ordinal or count (more than two groups)	Overall ICC	ICC ≥ 0.75			Refer to RM13003.

7.1.5.1.4 Agreed to Improvement Actions - Supplemental Requirements

The organization shall define and implement actions to resolve gaps in measurement system capability including mitigation actions to protect the customer.

7.1.5.1.5 On-Going MSA Requirements

The organization shall document a plan for continuing MSA needs (see [Table 3](#)).

7.2 Competence

7.2.1 Competence Achieved by On-the-Job Training - Supplemental Requirements

7.2.1.1 The organization shall provide on-the-job training in appropriate requirements.

7.2.1.2 In addition to the organization's employees, on-the-job training shall include contract or agency personnel.

7.2.2 Auditor Competence - Supplemental Requirements

7.2.2.1 The organization shall have a documented procedure to set and maintain the qualifications for all auditors that is compliant to [Tables 5, 6, and 7](#) (refer to RM13005).

NOTE: The auditor requirements of [Tables 5, 6, and 7](#) have been aligned with the four audit types identified in [9.2.3](#).

7.2.2.2 Documented information of auditor qualification shall be maintained and updated.

Table 5 - Minimum requirements for quality system auditors

Initial Training	Requirement
Lead Auditor Qualification	The Lead Auditor shall be trained in a QMS Lead Auditor training course adequate for the organization's certification level (e.g., 9100, ISO 9001, 9120) with documented content and examination. NOTE 1: This level of training is required for auditors that will be leading internal and/or supplier audits. NOTE 2: Training preferably delivered by an external body according to industry standards.
Auditor Qualification	Auditors shall be trained in audit methods and applicable industry QMS standards, by an external body, or by a qualified Lead Auditor that has successfully passed a QMS Lead Auditor training course. NOTE: It is recommended using a training provider that utilizes experienced QMS auditors, minimum 2 days, and contains audit methods and QMS standard overview.
9100 Overview Training	For all auditors that have received training against a standard that is not 9100, completion of the AS13100 Supplemental Quality Management System Requirements course (Course: PD532104) may be utilized to satisfy the requirements for both 9100 Overview Training and AS13100 Audit Proficiency.
AS13100 Audit Proficiency	All auditors shall receive training on all aspects of the AS13100 standard and the defect prevention tools (e.g. 8D, Design FMEA, Process FMEA, MSA) applicable to the scope of the auditor's audit activities.
Government or Airworthiness Authority Regulations (as applicable)	All auditors shall receive training (internal or external) on the applicable regulations.
Experience	Requirements
General Knowledge	All auditors shall have a minimum of 1 year of appropriate education and/or work experience in the application of quality management systems.
Customer-Specific Requirements	Auditors shall have a demonstrated working knowledge of the customer requirements (which may include government or airworthiness requirements) that are applicable to the product/process that is being audited. or The organization establishes checklists that include the customer requirements (which may include government or airworthiness requirements), and the auditor has been trained on the utilization of these checklists.
Quality Systems Audit Experience	Prior to an auditor completing audits alone, the auditor shall: • Witness a minimum of one Quality System audit. • Conduct a minimum of one Quality System audit evaluated by an existing qualified auditor or other subject matter expert as documented in the organization's QMS.
Maintenance	Requirements
Audit Frequency	Qualified auditors shall complete a minimum of one audit per year. NOTE: This requirement can be satisfied with a combination of internal and supplier audits.
Refresher Training	The organization's documented auditor qualification process shall ensure that all auditors receive timely refresher training when there are changes to the scope of QMS audits (e.g., customer requirement changes, industry standard changes).

Table 6 - Minimum requirements for production process or product auditors

Initial Training	Requirement
Auditor Qualification	Auditors shall be trained in audit methods and applicable QMS requirements (e.g., containment, control of nonconforming product, document control, inspection techniques) for the production process/product being audited.
9100 & AS13100 Overview Training	All auditors shall receive awareness training on the 9100 and AS13100 standards and the defect prevention tools (e.g., 8D, PPAP, Process FMEA, APQP) applicable to the scope of the auditor's audit activities. (Refer to RM13000 and RM13004.)
Experience	Requirements
Technical Knowledge	All auditors shall have a minimum of 1 year of technical knowledge of the production process or product being audited. NOTE: Additional technical knowledge may be needed for more complex production processes or products.
Process or Product Audit Experience	Prior to an auditor completing audits alone, the auditor shall: • Witness a minimum of one Process or Product audit. • Conduct a minimum of one Process or Product audit evaluated by an existing qualified Auditor or other subject matter expert as documented in the organization's QMS.
Customer-Specific Requirements	Auditors shall have a demonstrated working knowledge of the customer requirements that are applicable to the production process or product being audited. or The organization establishes checklists that include the customer requirements, and the auditor has been trained on the utilization of these checklists.
Maintenance	Requirements
Audit Frequency	Qualified auditors shall complete a minimum of one audit per year unless otherwise defined in the organization's QMS. NOTE: This requirement can be satisfied with a combination of internal and supplier audits.
Refresher Training	The organization's documented auditor qualification process shall ensure that all auditors receive timely refresher training when there are changes to the scope of audits (e.g., customer requirement changes, industry standard changes).

Table 7 - Minimum requirements for special process auditors

Initial Training	Requirement
Auditor Qualification	Auditors shall be trained in audit methods and applicable QMS requirements (e.g., containment, control of nonconforming product, document control, inspection techniques) for the special process being audited.
9100 & AS13100 Overview Training	All auditors shall receive awareness training on the 9100 and AS13100 standards and the defect prevention tools (e.g., 8D, PPAP, Process FMEA, APQP, Process control Methods) applicable to the scope of the auditor's audit activities. (Refer to RM13000 and RM13004.)
Experience	Requirements
Technical Knowledge	All auditors shall have a minimum of 5 years of combined theoretical and practical experience in the special process being audited. NOTE: Third-party special process auditors can be used to meet this requirement.
Customer-Specific Requirements	Auditors shall have a demonstrated working knowledge of the customer requirements that are applicable to the special process being audited. or The organization establishes checklists that include the customer requirements, and the auditor has been trained on the utilization of these checklists.
Special Process Audit Experience	Prior to an auditor completing audits alone, the auditor shall: • Witness a minimum of one Special Process audit. • Conduct a minimum of one Special Process audit evaluated by an existing qualified auditor or other subject matter expert as documented in the organization's QMS.
Maintenance	Requirements
Audit Frequency	Qualified auditors shall complete a minimum of one audit per year (either internal or supplier).
Refresher Training	The organization's documented auditor qualification process shall ensure that all auditors receive timely refresher training when there are changes to the scope of audits (e.g., customer requirement changes, industry standard changes).

7.2.2.3 Where it is not possible to satisfy the minimum technical knowledge and auditor qualifications in [Tables 5, 6, and 7](#) with the same individual, then the auditor shall be supported in the audit by a technical expert(s) as necessary.

7.2.2.4 Auditors shall not be assigned to, nor agree to perform any audits that they do not have the capability to properly conduct (e.g., insufficient experience and/or knowledge, conflict of interest); refer to RM13005.

7.2.3 Delegated Product Release Verification (DPRV) Representative Training - Supplemental Requirements

7.2.3.1 DPRV personnel shall be trained and certified in accordance with AS13001.

7.2.4 AS13100 Requirements Training and AESQ Quality Foundations Training - Supplemental Requirements

7.2.4.1 The organization shall define a cross-functional training plan for the organization to demonstrate that it has the right competencies to effectively implement the requirements of AS13100 and its supporting activities.

As a minimum, the training plan should include AS13100 Requirements and AS13100 Foundations Course for relevant personnel.

Employees who are responsible for implementing and maintain key quality tools should also receive formal training and development in order to demonstrate competence. The following subjects should be considered:

- a. RM13000 Problem Solving Methods (8D)
- b. RM13002 Alternate Strategies to 100% Inspection
- c. RM13003 Measurement System Analysis
- d. RM13004 Defect Prevention Quality Tools
- e. RM13005 Quality Audit Methods
- f. RM13006 Process Control Methods
- g. RM13007 Sub Tier Management
- h. RM13008 Design Work
- i. RM13009 Compliance Assessment (with Form) - Gap Assessment
- j. RM13010 Human Factors
- k. RM13011 Rework and Production Repair of Nonconforming Products
- l. RM13102 First Article Inspection

7.3 Awareness

7.3.1 Human Factors Awareness - Supplemental Requirements

The organization (see [5.1.1.1](#)) shall provide an appropriate program of training and awareness of human factors based on role; refer to RM13010.

7.5 Documented Information

7.5.2 Creating and Updating

7.5.2.1 Creating and Updating Documented Information - Supplemental Requirements.

7.5.2.1.1 When creating and updating documented information, the organization shall record, date, and ensure traceability to a responsible person making the change (e.g., name, signature, stamp, electronic signature), with a permanent marking method and the original information being legible and retrievable after the change.

7.5.2.1.1.1 Where the documented information is stored electronically, sufficiently detailed electronic records shall be maintained pertaining to the changes.

7.5.2.1.2 Documented Information such as records shall not be altered without proper traceable documented information permitting the alteration.