

Quality System Requirements Document

WPQR-9100

Revision: 30

TITLE

QUALITY SYSTEMS REQUIREMENTS FOR WOODWARD
SUPPLIERS

Stakeholder(s):

Purchasing
Product Family Leader

TABLE OF CONTENTS

PURPOSE.....

REFERENCES

SITUATIONAL REQUIREMENTS

DEFINITIONS

DOCUMENT REQUIREMENTS

APPENDIX

REVISION RECORD

PURPOSE

This specification defines for all Woodward sites and businesses the Woodward supply base quality management system requirements.

REFERENCES

Reference documents:

ISO 9001:2015
AS9100D
3-06-2977
3-OF-04182
4-06-2981
F27950

WISE Screens:

None

SITUATIONAL REQUIREMENTS

7.4 Purchasing

APPLICABLE SITES

Aken
Kempen-PS
Krakow
Niles
Prestwick
Rockford
Sofia

Stuttgart
Suzhou
Tianjin
Zeeland
Campinas
Zurich
Santa Clarita
Colorado
Duarte
Greenville
Hoofddorp
India
Japan
Kempen

*****NOTICE*****

THIS DOCUMENT AND ALL OF ITS REQUIREMENTS GO INTO EFFECT IMMEDIATELY WITH DEMONSTRATED COMPLIANCE NO LATER THAN SEPTEMBER 15, 2018.

UNTIL THAT DATE, COMPLIANCE WITH THIS REVISION IS PREFERRED, BUT COMPLIANCE WITH THE PREVIOUS REVISION IS REQUIRED AS A MINIMUM.

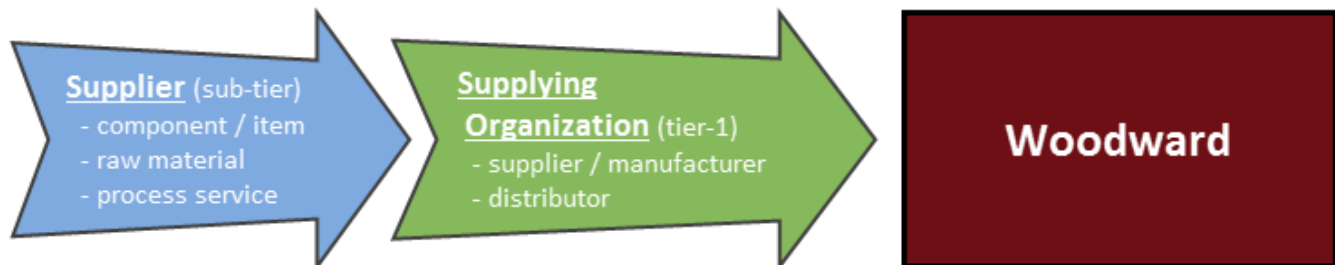
FOR SANTA CLARITA SITE SPECIFIC SUPPLIERS, THIS DOCUMENT AND ALL ITS REQUIREMENTS ARE EFFECTIVE IMMEDIATELY, REPLACING HRT QUALITY SYSTEM REQUIREMENT HRQP 5.210, WITH DEMONSTRATED COMPLIANCE NO LATER THAN SEPT 15, 2018.

Table of Contents

| | |
|--|----|
| INTRODUCTION | 6 |
| QUALITY MANAGEMENT SYSTEMS - REQUIREMENTS | 7 |
| 1. SCOPE | 7 |
| 1.1 GENERAL | 7 |
| 2. NORMATIVE REFERENCES | 7 |
| 3. TERMS AND DEFINITIONS | 8 |
| 3.4 KEY CHARACTERISTIC | 8 |
| 3.5 DELIVERABLE SOFTWARE | 8 |
| 3.6 NON-DELIVERABLE SOFTWARE | 8 |
| 4. CONTEXT OF THE ORGANIZATION | 8 |
| 4.1 QUALITY MANAGEMENT SYSTEM AND ITS PROCESSES | 8 |
| 5. LEADERSHIP | 9 |
| 6. PLANNING | 9 |
| 7. SUPPORT | 9 |
| 7.1 GENERAL | 9 |
| 7.2 COMPETENCE | 10 |
| 7.5 DOCUMENTED INFORMATION | 10 |
| 8. OPERATION | 11 |
| 8.2 REQUIREMENTS FOR PRODUCTS AND SERVICES | 11 |
| 8.4 CONTROL OF EXTERNALLY PROVIDED PROCESSES, PRODUCTS, AND SERVICES | 12 |
| 8.5 PRODUCTION AND SERVICE PROVISION | 12 |
| 8.6 RELEASE OF PRODUCTS AND SERVICES | 14 |
| 8.7 CONTROL OF NONCONFORMING OUTPUTS | 14 |
| 9. PERFORMANCE EVALUATION | 15 |
| 9.1 MONITORING, MEASUREMENT, ANALYSIS, AND EVALUATION | 15 |
| 9.2 INTERNAL AUDIT | 15 |
| 10. IMPROVEMENT | 16 |
| 10.2 NON-CONFORMITY AND CORRECTIVE ACTION | 16 |
| REVISION RECORD | 17 |

INTRODUCTION

This specification defines the Woodward supply base quality management system requirements and is applicable to supplying organizations and all members of their supply chain who provide production materials and services to Woodward or Woodward customers.



The supplying organization (i.e.; organization, seller - recipient of Woodward purchase order, tier-1 supplier to Woodward) is responsible for compliance with all applicable requirements of this specification. The supplying organization is also responsible for ensuring that their suppliers comply with the applicable requirements of this specification.

The Woodward requirements listed in this document are IN ADDITION TO the requirements established within the ISO 9001:2015 and AS9100D standards.

Additional quality requirements may be flowed as part of the contract or purchase order.

- ISO 9001:2015 (Quality Management Systems) is the international standard that provides a set of generic requirements for quality management systems that are intended to be applicable to all organizations, regardless of type, industry, sector (private or public), size, or product provided.
- AS9100D (Quality Management Systems - Requirements for Aviation, Space and Defense Organizations) is the widely adopted and standardized international quality management system requirements for the aviation, space, and defense industries. AS9100D is based on ISO 9001:2015 and specifies additional / supplemental requirements relating to quality and safety.

NOTE: Any paragraph of the published standards for which Woodward does not have additional requirements has been left out of this document entirely; therefore, paragraph numbers within this document are not always sequential.

QUALITY MANAGEMENT SYSTEMS - REQUIREMENTS

1. SCOPE

1.1 GENERAL

The supplying organization shall establish, document, implement, and maintain a quality management system that conforms to the requirements of ISO 9001:2015.

Requirements Format:

- Woodward requirements that apply to all supplying organizations are shown in normal text.
- *Supplemental aviation, space, and defense industry requirements, definitions, and notes, as required by Woodward, are shown in bold italic text.*
 - *Woodward aviation, space, and defense requirements, definitions, and notes are applicable when the Woodward purchase order states:*

“Additional aerospace requirements apply.”

2. NORMATIVE REFERENCES

The following documents are referenced within this specification and apply to the extent referenced.

When a document date or revision level is listed, only the dated edition or listed revision applies. The latest editions of undated documents apply.

Woodward documents - available from Woodward e-Business Center (www.woodward.com):

| | |
|------------|--|
| WPQR-9102 | Supplier PPAP Submission Content and Acceptance Requirements Specification |
| 3-06-2977 | AS/ATS Supplier Process Change Notification (PCN) |
| 3-OF-04182 | ICS Supplier Process Change Notification (PCN) |
| 4-06-2981 | 8D Supplier Report Form |
| F27950 | SNCR Notification form |

Other documents:

ISO 9001:2015 Quality management systems – Requirements (available from International Organization for Standardization at www.iso.org)

AS9100D **Quality Management Systems - Requirements for Aviation, Space and Defense Organizations** (available from Society of Automotive Engineers International at www.sae.org)

RTCA DO-178 Software Consideration in Airborne Systems and Equipment Certification (available from Radio Technical Commission for Aeronautics at www.rtca.org)

ANSI/NCSL Z540 Requirements for the Calibration of Measuring and Test Equipment
(available from American National Standards Institute at www.ansi.org)

ISO 10012 Measurement management systems - Requirements for measurement processes and measuring equipment (available from International Organization for Standardization at www.iso.org)

ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories (available from International Organization for Standardization at www.iso.org)

Notes are for guidance only and are not part of the requirements of the document.

3. TERMS AND DEFINITIONS

3.4 KEY CHARACTERISTIC

Key Characteristics – The features of a material, process, or part whose variation has a significant influence on product fit, performance, service life, or manufacturability.

3.5 DELIVERABLE SOFTWARE

Deliverable Software – All software, including software embedded in deliverable products or systems.

3.6 NON-DELIVERABLE SOFTWARE

Non-Deliverable Software – Software used in the design, manufacture, inspection, test acceptance, or calibration that has a direct effect on a deliverable product. Examples include, but are not limited to:

- Computer Aided Design (CAD)
- Computer Aided Engineering (CAE)
- Computer Aided Manufacturing (CAM)
- Computer Aided Inspection (CAI)
- Computer Numeric Control (CNC) or machine control data
- Automated Test System (ATS) or other computer-aided software to control production, test, or inspection related processes.

4. CONTEXT OF THE ORGANIZATION

4.1 QUALITY MANAGEMENT SYSTEM AND ITS PROCESSES

For each Woodward site / location to which the organization provides products or services, the organization shall:

- a) Submit current quality system certificates of registration / accreditation certificates to Woodward Supplier Quality Engineering,

- b) Report any change of quality system certification status (or change in approved / permitted exclusions) to Woodward Supplier Quality Engineering within 48 hours,
- c) Provide a written statement to Woodward Supplier Quality Engineering that identifies the details of any significant change that may affect the organization's business or approved quality system within 15 days of the change.

Examples of changes requiring communication / notification:

Ownership

Senior Management (e.g., President / CEO and leadership staff)

Quality Manager

Location / address

Industry focus

Third Party Quality System or NADCAP Registration

Customer or Regulatory Issued Sanctions

- 4.4.1 The organization shall establish, implement, maintain, and continually improve a quality management system, including the processes needed and their interactions, in accordance with the requirements of ISO 9001:2015 and meets the requirements of this document that appear in normal text.

When providing product to a Woodward site / location and the Woodward purchase order states, "Additional aerospace requirements apply", the organization shall establish, implement, maintain, and continually improve a quality management system, including the processes needed and their interactions, in accordance with the requirements of AS9100D and all the requirements of this document.

5. LEADERSHIP

No additional requirements beyond ISO 9001:2015 or AS9100D.

6. PLANNING

No additional requirements beyond ISO 9001:2015 or AS9100D.

7. SUPPORT

7.1 GENERAL

7.1.3 Infrastructure

Unless otherwise defined by process specification, inspection activities should be performed in areas with work surface illumination of 100 foot-candles (1076 Lux) or greater.

Illumination values less than 100 foot-candles (1076 Lux) shall be substantiated and documented.

NOTE: Inspection devices such as microscopes, ring lights and optical comparators have fixed light sources. By design, they may not meet the 100 foot-candles (1076 Lux) illumination value. Evaluation of these inspection devices shall be done to ensure they are suitable for use.

7.1.5 Measuring and Monitoring Resources

Measuring equipment shall be maintained within a calibration system that is compliant to the requirements defined in ANSI/NCSL Z540 or ISO 10012.

7.2 COMPETENCE

The organization shall implement a documented process to ensure that all individuals performing visual inspection and/or other product acceptance activities have an annual eye examination administered by a medically qualified / trained person.

Vision examination requirements:

- ***Near Vision - Snellen 14/18, (20/25), Jaeger 2 at not less than 12 inches.***
- ***Color Vision - Must be able to distinguish and differentiate between colors used during the product acceptance or certification process.***

If vision correction is prescribed, each individual shall use the required corrective lenses when performing visual inspection and/or other product acceptance activities. If an individual is not able to meet the color vision requirements, the individual's work limitations shall be defined based on the need for color perception with specific processes/tasks.

Records of eye examination results shall be retained (see 7.5.3.2-d below).

7.5 DOCUMENTED INFORMATION

7.5.1 General

The organization shall make available for Woodward review and approval: drawings, associated lists, and other engineering documentation establishing the design configuration of products produced for Woodward. Documentation deemed proprietary by the organization shall be appropriately identified and made available for Woodward review in accordance with the governing proprietary / non-disclosure agreement.

Additionally, the organization or organization's representative shall make quality records available for evaluation for the contractually agreed period. Records shall be available for review by Woodward and regulatory authorities in accordance with contract or regulatory requirements.

7.5.2 Creating and Updating

Records may be in the form of any type of media, such as hardcopy or electronic media, and shall be documented using permanent methods, remain legible, readily identifiable and retrievable.

Records containing blank entries shall be considered incomplete unless specifically defined in applicable procedures or work instructions.

Temporary Changes and Error Correction - The only acceptable method of correcting paperwork is by drawing one straight line through the incorrect portion of the entry. Original data must be legible after the correction. The correct entry should be made by any permanent suitable means adjacent to the incorrect entry, along with the date and the signature of the employee making the correction.

Software:

- ***Deliverable Software*** – *For deliverable software and software contained in deliverable articles used in flight applications, the organization shall comply with all elements of the current version of the Radio Technical Commission for Aeronautics (RTCA) DO-178 as a guide during development, production, inspection and service of airborne software in addition to all Woodward specified requirements defined by the SOW (Statement of Work) or purchase order.*
- ***Non-deliverable Software*** - For non-deliverable software the organization shall create and maintain records and procedures which control configuration and accuracy of software used to manufacture, test, or inspect product. These documents shall be provided to Woodward on request.
- The organization shall develop a Software Quality Approval Plan (SQAP) or maintain detailed records that, as a minimum, address the following requirements:
 - Development requirements
 - Verification / Validation Testing
 - Documentation, including purpose
 - Change / Revision Control
 - Storage / Preservation / Security

7.5.3 Control of Documented Information

7.5.3.2-d Retention and Disposition

Unless otherwise specified by the Woodward purchase order or contract, quality records shall be retained for a minimum of (30) thirty years. Radiographic records shall be retained for a minimum of (10) ten years.

8. OPERATION

8.2 REQUIREMENTS FOR PRODUCTS AND SERVICES

8.2.3.1-e In the event of conflicting requirements, the Woodward purchase order takes precedence followed by Woodward Engineering Drawing requirement / specification

drawing(s) referenced by the purchase order. Purchase order specification references are intended to supplement engineering or quality system requirements.

8.2.4 Whenever a specification appears on the drawing or is listed as a requirement on the purchase order, the organization must use the latest revision of that document or, follow the direction given in that document for replacement / supersession to the active applicable version of that specification, unless otherwise specified.

8.2.4 As applicable, additional conformance or compliance verification requirements may be required and shall be communicated through the Woodward purchase order.

8.4 CONTROL OF EXTERNALLY PROVIDED PROCESSES, PRODUCTS, AND SERVICES

Woodward reserves the right to impose source inspection requirements at the supplying organization's facility.

8.4.2 Type and Extent of Control

8.4.2-d The organization shall institute an audit testing plan to assure data received is representative of the raw material, heat treating, plating and other special processes and the material is in conformance with requirements.

Audit testing is to be performed by a testing laboratory other than the one used by the material source.

8.5 Production and Service Provision

8.5.1 Control of Production Service and Provision

8.5.1.1 Control of Production Equipment, Tools, and Software Programs

When software programs are developed by the organization, coding guideline documentation (e.g., naming conventions, comments, etc.) and approval required for release shall be defined.

Storage requirements, including secure locations and periodic preservation / condition checks, shall be defined for production equipment, tooling, and numeric control (NC) software programs in storage.

8.5.1.2 Validation and Control of Special Processes

Subcontracted special process requirements are applicable when a special process is required for a part / product as indicated by the Woodward drawing or specification:

- ***Special Processes defined by a Woodward specification shall be performed by a source approved by Woodward for that process.***
- ***Processes otherwise defined shall be performed by a source certified by NADCAP or approved by Woodward for that process.***

NOTE: The Woodward approved source list for subcontracted special processes can be found on the Woodward e-Business Center / supplier portal (www.woodward.com).

8.5.1.3 Production Process Verification

Evidence of compliance shall be submitted to Woodward in accordance with WPQR-9102 (Supplier PPAP Submission Content and Acceptance Requirements Specification). PPAP shall be re-accomplished and submitted when a lapse in production of 2 or more years of time has occurred.

8.5.2 Identification and Traceability

The organization shall establish and maintain a system that provides traceability of material and processes throughout product realization that is capable of identifying:

- ***the material lot(s) used in the production of any product***
- ***acceptance records of the production material***
- ***all product manufactured from a given lot of material***

The traceability system shall provide sufficient means to maintain current revision, specification, and quality requirements from raw material through finished product (per Woodward purchase order) for all materials and processes used by the organization and its suppliers.

Serialized parts / assemblies and detail parts used in assemblies shall be traceable to the manufacturing lot(s) in which they were produced, as well as the material(s) used to produce them.

NOTE:

- ***Duplication of serial numbers for the same product supplied to Woodward is strictly prohibited.***
- ***The traceability requirements of this section do not apply to organizations that supply product or services that support production but are not intended for use in the end product (e.g. organizations supplying shipping containers, protective closures, undefined assembly and test aids, etc.).***

8.5.3 Property Belonging to Customers or External Providers

In the event that Woodward issues materials or components to a work order done by an organization, and that content becomes part of the delivered product to Woodward, the organization shall ensure that the issued material is used on that work order only.

NOTE: Woodward property can include tools / equipment or intellectual property, including Woodward furnished data used for design, production, and/or inspection.

8.5.4 Preservation

The organization shall incorporate good commercial standard practices and methods for the preservation, packaging, and shipment to preclude damage to products during shipment to Woodward or deterioration while in storage at the supplying organization or Woodward.

Appropriate protective wear such as gloves, finger cots, barrier creams, etc., shall be used to prevent damage resulting from staining or rusting.

Divided containers or individual packaging, etc., shall be used for material susceptible to damage from part-to-part contact. Use of staples, paper clips, or other potential sources of Foreign Object Damage / Foreign Object Debris (FOD) is prohibited in packaging.

8.5.4-e The organization shall segregate products by manufacturing lot / cure date for shipment to Woodward.

8.5.6 Control of Changes

The organization shall make no changes in design, materials, manufacturing location, manufacturing processes / technologies, or sources of supply without notifying Woodward, for approval prior to implementation, of any changes that affect the approved configuration as defined in either 3-06-2977 (AS/ATS Supplier Process Change Notification) or 3-OF-04182 (ICS Supplier Process Change Notification); refer to those documents for details on supplier and Woodward plant applicability.

8.6 Release of Products and Services

When required by specification or quality plan, performance records and functional test data shall, as a minimum, include the following:

- test specification number and revision,
- part / product number and revision,
- part / product serial number,
- date the test was performed
- actual test readings
 - Where results are not quantifiable, attribute statements are acceptable (e.g., "PASS", "No Leakage", etc.)
- technician / operator identification
- approval status

8.7 Control of Nonconforming Outputs

Unless otherwise instructed by Woodward in writing, the organization shall obtain formal, documented approval from Woodward prior to shipping non-conforming material.

Woodward reserves the right to reject any shipment of non-conforming product.

Nonconforming product shall be reviewed in accordance with documented procedures. It may be:

- a) Reworked to meet the specified requirements;
- b) Accepted with or without repair - formal Woodward approval required;

- c) Re-graded for alternative applications - formal Woodward approval required;*
- d) Rejected or scrapped.

Depending on a site's individual quality requirements, Woodward has two standard methods for reviewing non-conforming material--an "SNCR" method and a "Concession" method (each one is summarized below). Refer to the Woodward site's specific procedure or the PO for details on requesting review and approval from Woodward to ship non-conforming product; or, contact your Woodward Quality or Supply Chain representative for a detailed procedure.

SNCR Method

The organization shall obtain formal approval to ship a non-conformance by requesting an SNCR (Supplier Non-Conformance Record) utilizing the Woodward e-Business supplier portal. After receiving the appropriate approval to ship, the organization shall complete and submit SNCR notification form F27950 (SNCR Notification) and a copy of the approved SNCR with any shipment of Woodward approved nonconforming material. Refer to the Woodward e-Business supplier portal at www.woodward.com for form F27950 and an SNCR submittal tutorial.

CONCESSION Method

The organization shall obtain formal approval to ship a non-conformance by requesting approval of a CONCESSION to ship form. After receiving the formal approval to ship, the organization shall complete and submit a copy of the approved CONCESSION form as well as any related documentation along with any shipment of Woodward approved nonconforming material.

In the event a condition is discovered that affects previously delivered product (including a latent defect), the organization shall notify Woodward in writing of the delivered nonconforming product condition within 48 hours of discovery. Notification shall be sent to the attention of Woodward Supplier Quality Engineering at the affected sites / locations. The notification must include, to the extent known, all pertinent information concerning the condition (i.e., part numbers, serial numbers, quantities, time frame, affected deliveries, description of condition, etc.), the containment / corrective action taken, and the potential impact of the defect to the function and reliability of the product.

9. PERFORMANCE EVALUATION

9.1 Monitoring, Measurement, Analysis, and Evaluation

9.1.1 General

Quality Costs - The supplying organization shall establish and maintain a financial measurement system that evaluates the cost of quality (categories may include prevention, appraisal, internal loss and external loss). This information shall be reviewed and shall be given consideration when making assessments of the effectiveness of the Quality System.

9.2 Internal Audit

Internal quality audits shall cover all elements of the quality system. The frequency between internal audits on any element shall not exceed 18 months.

10. IMPROVEMENT

10.2 Non-conformity and Corrective Action

10.2.2

All responses to Woodward corrective action requests (CAR) shall include objective evidence that the direct, contributing and root causes have been identified on form 4-06-2981 (8D Supplier Report Form) or equivalent.

In the event that supplier corrective action attempts have been unsuccessful in eliminating non-conformances, Woodward reserves the right to invoke additional process control measures to drive process improvement and ensure product conformance. When necessary, the additional process controls will be specified on the purchase order.

REVISION RECORD

DOCUMENT CHANGE HISTORY

| Date | Change Summary / Reason / Requested By | Changed by | Approved by |
|-------------|---|-------------------|--------------------|
| 30-Apr-2018 | Rev 30: -Restructured to match the formats of ISO 9001:2015 and AS9100D -Content of doc contains only Woodward's additional requirements to ISO 9001:2015 and AS9100D -Applicable Sites: added Santa Clarita | John Stencel | Jennifer Williams |
| | | | |