# Quality System Requirements Document

# WPQR-9100

Revision: 41

**TITLE**

QUALITY SYSTEMS REQUIREMENTS FOR WOODWARD SUPPLIERS

**Stakeholder(s):**

Purchasing
Product Family Leader

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## PURPOSE

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

## REFERENCES

**Reference documents:**

ISO 9001:2015
4-QCI-08056
AS9100D
AS9115A
3-06-2977
3-OF-04182
4-06-2981
F27950
4-QCI-05357
WPQR-9102

**WISE Screens:**

None

## APPLICABLE SITES

All Woodward Plants

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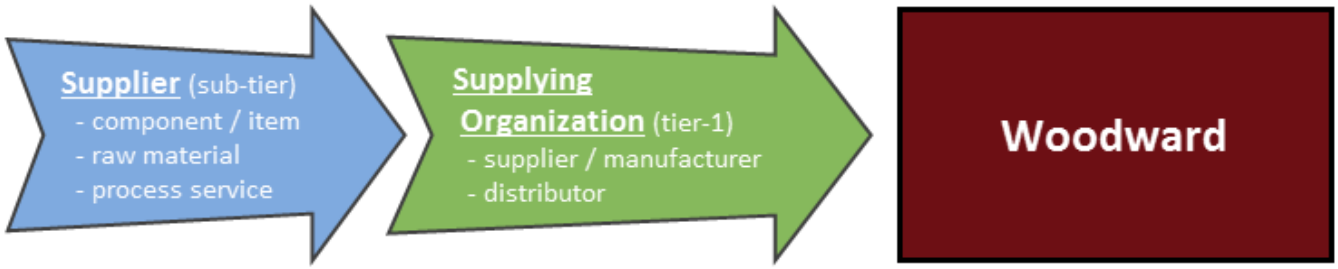
## INTRODUCTION

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.

**NOTE**: Some exceptions MAY apply for suppliers of Commodity Items as defined within this document; see paragraphs 3.8 and 4.4.1 for details. If there is any question as to the applicability of the Commodity Item definition and/or exception, the supplier should contact their Woodward Supply Chain or Supplier Quality representative.

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.

- AS9115A (Quality Management Systems – Requirements for Aviation, Space and Defense Organizations – Deliverable Software (Supplement to 9100) This document supplements the 9100 standard requirements for deliverable software and contains quality management system requirements for organizations that design, develop, and/or produce deliverable software for the aviation, space, and defense industry. This includes, as required, support software that is used in the development and maintenance of deliverable software. The deliverable software may be stand-alone, embedded, or loadable into a target computer.

- AS13100 (Quality Management System Requirements for Aero Engine Design and Production Organizations) Engine manufacturers over the years have developed their own set of

requirements to supplement those already defined in AS9100 or ISO 9001. This standard, created by the SAE G-22 Aerospace Engine Supplier Quality (AESQ), is to establish a common set of Quality Requirements within the Global Aero Engine Supply Chain.

**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 | Supply Chain Process Change Notification (PCN) Process for Woodward Loves Park (01), Zeeland (02), Santa Clarita (11), Niles (16), Niles 6250 (A2), Drake (A1) and Rock Cut (RC) Campus |
| 3-OF-04182 | E&TC Supplier Process Change Notification (PCN) |
| 4-06-2981 | 8D Supplier Report Form |
| F27950 | SNCR Notification form |
| 4-QCI-05357 | AS9115 Audit Checklist |

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) |
| AS9115A | Quality Management Systems – Requirements for Aviation, Space and Defense Organizations – Deliverable Software (Supplement to 9100) (available from Society of Automotive Engineers International at www.sae.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) |
| AS13100 | AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations (available from Society of Automotive Engineers International at www.sae.org) |

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

## 3. TERMS AND DEFINITIONS

### 3.6 Deliverable Software

All software, including software embedded in deliverable products or systems.

### 3.7 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.

3.8 Commodity Items

Purchased materials, Commercial Off The Shelf (COTS) parts, or Catalog Items that are commonly available to the open market at the item level, and

- The organization or supplier manages and owns the drawing and specification for the item,
- The organization or supplier owns engineering and process control for the item,
- The item is typically controlled by a published industry standard,
- The item does not typically have a design record (drawing) within the Woodward system.

Examples of COMMODITY ITEMS are common mechanical or industry standard hardware items (such as nuts, bolts, screws, washers) and common electronics components (resistors, capacitors, wire, connectors).

## 4. CONTEXT OF THE ORGANIZATION

4.1 Understanding the Organization and Its Context

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

d) Grant Woodward, its customers, and regulatory authorities the right of access to applicable areas of all facilities at any level of the supply chain involved in the order and to all applicable records. The organization shall flow down this right of access clause to all sub-tier and raw material suppliers through the supplier's purchasing system.

4.3 Paragraph removed per Revision 40 update

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.***

COMMODITY ITEM EXCEPTIONS:

- ***For suppliers and/or sub-tier suppliers of UNMODIFIED COMMODITY ITEMS where the PO states "Additional aerospace requirements apply", compliance or certification to AS9100D is required at a minimum; (i.e. the additional requirements of WPQR-9100 generally do not apply).***

- For suppliers and/or sub-tier suppliers of UNMODIFIED COMMODITY ITEMS where the PO does **NOT** state "Additional Aerospace requirements apply", compliance or certification to ISO-9001:2015 is required at a minimum.

- For suppliers or sub-tier suppliers of MODIFIED COMMODITY ITEMS defined by a Woodward drawing or specification, all requirements of this document apply; however, for the supplier of the base (unmodified) COMMODITY ITEM, compliance to ISO9001:2015 or AS9100D is required as noted above.

    - Examples of modifications to COMMODITY ITEM include but are not limited to: lock patch, lubricant, or lock-wire holes applied to fasteners; custom identification or obliteration of marking items such as fasteners, seals, O-rings, connectors; and catalog cabinets with additional cutouts or terminal blocks.

- COMMODITY ITEM EXCEPTION EXAMPLE: ABC Supplier adds a lock patch to an industry standard cap screw and provides the modified screw to a Woodward aerospace site; sub-tier supplier XYZ provides an industry standard cap screw (a commodity item) to Supplier ABC for the modification. Supplier ABC is required to be compliant to WPQR-9100 because of their modifications to the commodity item; sub-tier Supplier XYZ is only required to be compliant to AS9100, since they provided an unmodified commodity item to Supplier ABC.

## 5. LEADERSHIP

No additional requirements beyond ISO 9001:2015, ***AS9100D***,

## 6. PLANNING

No additional requirements beyond ISO 9001:2015 or AS9100D.

# 7. SUPPORT

## 7.1 Resources

### 7.1.2 People

***The organization shall ensure that employees are aware of:***

- ***Their contribution to product or service conformity***
- ***Their contribution to product safety***
- ***The importance of ethical behavior***

### 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).***

7.2.1 Competence

The organization shall ensure employees are competent, including any required qualification of persons. Appropriate documented information shall be retained as evidence of competence.

NOTE: Applicable actions can include, for example, the provision of training to, the mentoring of, or the re-assignment of currently employed persons; or the hiring or contracting of competent persons.

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.*

- ***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 AS9115 Quality Management Systems Requirements for Aviation, Space and Defense Organizations – Deliverable Software (Supplement to 9100)*

- 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:

Industrial (5) five years for all records including radiographic records following the delivery of the last Order.
***Aerospace** (40) forty years. Radiographic records shall be retained for a minimum of (11) eleven years.*

NOTE: Critical Safety Items (40) years includes all quality documents including, but not limited to, radiographic film.

## 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.

***8.4.1.4*** *Paragraph removed per Rev 40*

***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.***

***8.4.2.4 Product Acceptance***

***When product acceptance authority media are used (e.g. stamps, electronic signatures, passwords), the supplier shall establish controls for the media appropriate to:***

- ***Avoid misuse***
- ***Establish traceability to the authorized user***
- ***Avoid duplication***
- ***Align to responsibilities and authorities defined within the quality system***
- ***Maintain good condition and legibility***

## 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 (Exception: 3 Years for Plant 04 WLC).

### *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 (Supply Chain Process Change Notification (PCN) Process for Woodward Loves Park (01), Zeeland (02), Santa Clarita (11), Niles (16), Niles 6250 (A2),

Drake (A1) and Rock Cut (RC) Campus) or 3-OF-04182 (E&TC Supplier Process Change Notification (PCN)); 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 Non-Conforming 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.

<u>SNCR Method</u>
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 non-conformity and/or counterfeit part 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 24 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. PEFORMANCE 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.

#### 9.1.2 Customer Satisfaction

The organization is required to review Woodward provided performance metrics. Woodward issues a Supplier Performance Scorecard monthly. The organization is responsible to access their scorecard on the Woodward e-Business Center / supplier portal at www.woodward.com to view the results and take appropriate action to address negative performance in a timely and effective manner.

### 9.2 Internal Audit

For suppliers not holding their ISO9001 or AS9100 certification; 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 |
|---|---|---|---|
| 01-Apr-2024 | **Rev 40:**<br>**Change requested by:** Anita Tucker<br>**Change made:**<br>Change 1 Removed Para 4.3 and Table 2 related to Aero engine components.<br>Change 2 Removed Para 8.4.1.4<br>**Need For Change:**<br>Change 1 The requirements only apply for suppliers providing engine components directly to the engine manufacturers.<br>Change 2 Same as Change 1 need. | Thomas McBee | Anita Tucker<br>Luci Kolkey |
| 12-May-2025 | **Rev 41:**<br>Change requested by: Steve Daub<br>**Change Made:** Added (NOTE: Critical Safety Items (40) years, includes all quality documents including, but not limited to, radiographic film.)<br>**Need For Change**: Internal audit findings showed a need to communicate and drive this requirement per AS13100 | George Garner | Luci Kolkey<br>Brian Gorman<br>Anita Tucker<br>Agnieszka Maciaszek |