

United Technologies Procedure

Operating Procedure: OP-721-01 Revision C

Effective Date: 04-13-2017

Owner Approval: Andrew Adams, Quality Assurance Manager on 04-12-2017

Management Approval: Craig Garneau, President on 04-12-2017

1. PURPOSE

To define those product and quality system requirements specific to United Technologies (UTC) Supplier Quality System Requirements outlined in ASQR-01 and related specifications.

2. ISO REFERENCE

AS9100/AS9120 Clause 7.2.1

3. SCOPE

This procedure applies to all Quality Name Plate, Inc (QNP Inc.) orders where ASQR-01 is invoked.

4. APPLICABLE DOCUMENTS

- 4.1 The following documents of the latest issue form a part of this procedure.
- 4.2 Quality Systems Manual;
- 4.3 Procedures Manual;
- 4.4 UTAS Supplier Authorization and applicable HSM17 specification;
- 4.5 Sections shall apply for all UTAS shipments.

5. RESPONSIBILITIES

5.1 The Quality Manager, or designee, is responsible for maintaining a documented quality system assuring compliance to ASQR-01 and all related customer quality specifications.

6. SPECIFIC REQUIREMENTS

- 6.1 QNP Inc. is responsible for satisfying all UTC purchase order requirements and ensuring the quality of all articles purchased by UTC. QNP Inc. facilities, systems, procedures, and work instructions are subject to UTC's inspection and/or approval. This approval shall not be used as evidence of effective control of quality. In addition, this approval does not absolve QNP Inc. of the responsibility to provide acceptable product or preclude subsequent rejection by UTC.
- 6.2 Must work to latest revision of customer specification.
 - 6.2.1 All UTC Member company specifications must be reviewed at a minimum of three (3) times a year.
- 6.3 Changes that may affect quality will be documented, communicated and approved by UTC. Examples of changes that may affect quality include (but is not limited to) changes in ownership, senior management, manufacturing location, and process or inspection techniques.
- 6.4 Changes to customer document/procedure/specification shall be implemented within 60 days or revision date.
- 6.5 Should there be a change in QNP Inc. AS9100 registration status; QNP Inc. will notify UTC in writing of such change within two business days.
- 6.6 QNP must notify the UTC member company of any changes (e.g. Pratt & Whitney Canada, UTAS, Pratt & Whitney)

- 6.6 All documents, records, gaging, or other customer supplied product will be returned to UTC upon written notification from UTC member or when business with the UTC member has ceased.
- 6.7 Product that has left QNP Inc. quality control system and is known or suspected to be Nonconforming shall be reported to UTC procurement personnel. This notification report shall be made within 24 hours or the next business day after the defect was found. The reports shall be transmitted in a manner directed by UTC, and shall include, as a minimum, the part number, article nomenclature, the nature of the defect, and any other information necessary to isolate and control all articles involved.
- 6.8 As part of the corrective action process for non-conforming products shipped to UTC, QNP Inc. will impose ASQR-01 paragraph 8.3 on our supplier for items being shipped to UTC. ASQR-01 paragraph 8.3 will require QNP Inc. to perform 100% inspection of the rejected characteristic(s) on the next three consecutive lots.
- 6.9 QNP Inc. must perform First Article Inspection (FAI). FAI shall be performed in accordance with SAE AS 9102 and the additional requirements below.
- A replication of product part marking (via photograph or sample) that represents production marking must be included within the FAI Report.
 - QNP Inc. is responsible for assuring completion of the FAI Report for all finished part characteristics.
 - At any time, a UTC member may request a complete FAI to be performed in lieu of a partial (delta) FAI.
 - Additional requirements for AS 9102 FAI Form 1:
 - Field 11, Supplier Code:
Record UTC Member assigned Supplier Code.
 - Field 12, P.O. Number:
Record UTC Member Purchase Order Number.
 - Additional requirements for AS 9102 FAI Form 3:
Field 14, for each characteristic: Record FAI Inspection Measuring Equipment used as a media of inspection. Record FAI inspector identification (e.g., signature, stamp, electronic authorization, etc.) used to signify the person that accomplished the inspection.
- 6.10 For PWC FAI's, approving DQR must stamp the "Reviewed By" line with PWC Final Inspection Stamp.
- 6.11 Sampling Plan: All inspection sampling for UTC will be performed in accordance to ASQR 20.1 Supplier Sampling Requirements.
- 6.11.1 To qualify to use a .65% or 2.5% AQL sampling plan, a minimum of 25 consecutive pieces are required to be inspected and no nonconformance's detected.
- 6.11.2 Additional sampling requirements found in OP-824-02
- 6.11.3 Sample parts are to be randomly selected and representative of the lot population.
- 6.11.4 Additions or Exchanges to the original samples are not permitted.
- 6.11.5 Sampling inspection is not permitted for CHARACTERISTICS affected by rework or repair dispositions.
- 6.11.6 TNR (Tightened, Normal, and Reduced) characteristics switching rule chart, see Appendix 1. AQL levels for tightened and reduced inspection shall be on level above and below .65% for major characteristics and 2.5% for minor characteristics, respectively.
- 6.11.7 Sampling inspection shall begin at Normal. However, Tightened and Reduced levels of inspection are optional. (See Appendix 1)
- 6.12 Functional performance/test data, when required, will conform to the requirements found in ASQR-01.
- 6.13 Verification of Purchased Product
- 6.13.1 QNP Inc. will provide raw materials test reports / certification results / laboratory analysis requirements (e.g., tensile strength, stress rupture, hardness, chemical composition, etc.), as defined by the product definition and/or the purchase order.
- 6.13.2 Where test reports are used to verify purchased product, the data in those reports shall be acceptable per applicable specifications. QNP Inc. shall periodically validate test reports for raw material.

6.13.3 Upon receipt of a UTC Member purchase order requiring Government oversight QNP Inc. shall notify the Government Representative

6.14 QNP shall permit UTC member companies access to all data in OASIS databases including registration documentation, certification, audit reports, findings, corrective actions, etc.

6.15 Delegated Quality Representative (DQR) requirement shall comply with AS9117 in defining its minimum system and personnel requirements. To include the following:

- Request and obtain approval for acceptance in Member DQR program using ASQR-01 Form 8 once every three (3) years
- Request and obtain approval from the Member for DQR candidates using ASQR-01 Form 7
- Candidate must attend and pass AS13001 DQR training provided by third party source
- DQR candidate/personnel must successfully complete supplementary Member product, process and procedural training within the Member required timeframe.

6.16 Management shall conduct compliance audit of ASQR-01 and Member-unique requirements at least once every 12 months. ASQR-01 Form 1 shall be used to complete the audit with appropriate documents identified that demonstrate compliance.

7. SUPPLIER REQUEST FOR INFORMATION:

7.1 QNP Inc. shall submit to the applicable procurement personnel Supplier Request for Information (SRI) ASQR-01 Form 3 for the following items:

7.1.1 An anomaly noted in a drawing or specification that could result in a nonconformance.

7.1.2 Lack of clarity or definition in a drawing or specification. Alternate method to a quality system requirement from the applicable UTC Member.

Note: *SRI's are not to be used for processing non-conformances.*

7.2 QNP Inc. will comply with established SRI's contained on the listing provided by the UTC Member. When a specific Approval of Supplier's Alternate Procedure (ASAP) is no longer required, the UTC Member will be notified.

7.3 Verbal agreements and instructions are not allowed. All communications with UTC customers must be written in the English language. These communications include Quality Systems Manual and Procedures and process documentation which require approval or source qualification by UTC customer.

7.4 QNP Inc. will comply with any UTC Member's material requirements for material and/or special processes when they are referenced in a specification, drawing, or when a purchase order stipulates "Process Approval, e.g., UTAS Report 80/85 etc. lab testing will be performed in accordance with the UTC Member's requirements and approved sources as required.

7.5 QNP Inc. will use only the applicable UTC Member's approved sources to perform NDT inspections specified on the Member's purchase order, engineering drawing, or any other technical data considered part of the contract. The NDT source shall be listed on the packing slip as appropriate.

7.6 QNP Inc. will ensure that personnel, equipment, and processes are certified, where required on a UTC specification, engineering drawing, or purchase order. All employees will receive training appropriate to their job function as necessary.

7.7 QNP Inc. will provide samples when available and inspection results for review when requested by a UTC member. If an inspection review is deemed unsatisfactory, corrective action will be implemented in a timely manner.

7.8 Product not controlled to UTC purchase order requirements or received by a UTC member with authorized non-conformances shall be subject to rejection. In addition, QNP Inc. systems used to meet the purchase order requirements are subject to UTC disapproval. An investigation will be conducted when notified by UTC that discrepancies or potential discrepancies have been found in the company's systems, processes, or product. The results of this investigation will be reported to the appropriate UTC Member's Quality Assurance within the time frame indicated, or 15 days when no time frame is specified.

8. MARKING REQUIREMENTS

- 8.1 Product manufactured for UTC, or UTC end use, will be marked in accordance with the applicable UTC Member's requirements, unless otherwise specified on the engineering drawing or purchase order, e.g., PWA 310, CPW 10, HS 333.
- 8.2 Product manufactured for UTC or UTC end use, will be marked with the appropriate acceptance symbol, when it conforms to all purchase order and engineering drawing requirements.
- 8.3 QNP Inc. shall ensure the UTC registered trademarks is only applied to UTC end use articles. Product identified with a UTC Acceptance Symbol will only be shipped to UTC or a UTC approved destination.
- 8.4 When material substitutions are made as permitted in PWA 301, the material used to produce the article shall be noted on the packing slip.
- 8.5 Corrections to work instructions or documents must be recorded, dated and signed in ink. Original data must still be legible after the correction has been made. Electronic entries will be recorded; original data shall be relievable after the change.
- 8.6 When purchasing material / product from a supplier for a UTC member's end use, QNP Inc. purchase order will stipulate that the order is for the applicable member's end use. All applicable purchase order requirements will be flowed down to the supplier (i.e., ASQR-01).
- 8.7 A copy of the UTC purchase order, less pricing data, will be supplied to suppliers whenever UTC Source Inspection is requested on the purchase order to the supplier.

9. EYE EXAMINATION

- 9.1 Eye examinations (to include visual acuity and color vision, Jaeger Type 2 or equivalent) will be administered to all individuals performing visual inspection by a medically trained person. These examinations shall be administered on an annual basis (as a minimum) and the results of these examinations will be retained as quality records.
- 9.2 Individuals failing to meet the minimum vision requirements shall have their job assignment reviewed by supervision to ensure that their inspection duties can be efficiently and effectively performed.
- 9.3 Results of eye examination will be verified against criteria specified in ASQR-01 listed below
 - Color Perception testing is required one time only. Individuals shall be capable of adequately distinguishing and differentiating colors used in the method for which certification is required, the process being performed or inspection activity. Documentation shall be retained. Records shall be retained for each individual.
 - Individuals performing visual inspection (i.e. calibration, non-weld, in-process, layout, dimensional) shall be compliant with near vision requirements of Snellen 14/18, (20/25), Jaeger at not less than 12 inches.
Note: *Vision tests may be substituted for the options listed above providing the equivalence is verified and documented by a licensed optometrist.*

10. FOD

- 10.1 Foreign Object Damage (FOD) – Damage to product caused by a foreign object
- 10.2 Foreign Object Debris (FOD) – Foreign particles which could potentially cause damage to a product
- 10.3 Examples of FOD may include:
 - Food and beverage control;
 - Part processing and assembly;
 - Proper cleaning on internal cavities;
 - Tool and small part accountability;
 - Critical part openings;
 - Loose objects;
 - Oils or process residue.
- 10.4 ASQR-15.1 defines requirements for Foreign Object Damage/Debris Prevention. Handling, Storage, Packaging, Preservation and Delivery of product, material, or services supplied to a UTC member company.

11. GENERAL

- 11.1 All employees shall be trained to assure compliance with packaging, handling, shipping and storage requirements.

- 11.2 Materials used in the packaging, handling, shipping and storage which have intimate contact with the part shall be free of contamination.
- 11.3 Parts shall be packaged in a manner that will preclude any chance of one item making contact with another during normal handling operations.
- 11.4 Protective and packaging materials shall be chosen based on the ability to adequately protect and prevent tearing from either internal or external sources.
- 11.5 FOD occurrences shall be documented.
- 11.6 QNP must notify PWC of any changes

12 MAINTAINING CLEAN WORK AREAS

- 12.1 All employees must maintain their work areas in a clean, 5S environment. Employees shall take steps to clean the immediate area after work is completed on one job and before another job is started to prevent co-mingling of parts and other items leading to FOD.

13. DETECTION AND REMOVAL OF FOD

- 13.1 At every step in the process, employees will perform a visual inspection to ensure parts are free from FOD. These areas include:
 - In-process inspection
 - Packing
 - Final inspection
 - Dispatch and shipping
- 13.2 Should FOD be detected, the employee will take appropriate action commensurate to the nature and degree of debris or damage found. Such disposition may include:
 - Removing and discarding damaged parts
 - Removing contaminants via sorting and/or cleaning processes
 - Rejecting the parts

14. MEASURING EQUIPMENT

- 14.1 Calibration frequency may be adjusted based on results of previous calibrations. The certification shall be reviewed for indication of wear in comparison to the prior calibration. When a visible trend is identified, the calibration interval may be adjusted to compensate.
- 14.2 The calibration interval must meet a minimum reliability target of 95% for measuring and test equipment in-tolerance at the end of their interval schedule.
- 14.3 The significant out of tolerance condition limit is 200% of that specified by the manufacturer of the piece of equipment and/or inspection measuring and test equipment exceeds 25% of the product tolerance.
- 14.4 QNP Inc. generally selects inspection measuring and test equipment with an accuracy ratio of 10 to 1 (product tolerance to equipment tolerance), unless otherwise specified. (Ref. AS13003)
- 14.5 After evaluation of the out of tolerance condition by the Quality Manager, notification of QNP Inc. findings is forwarded to all customers in receipt of affected audited product. Affected product is determined by reviewing receiving inspection records for listing of out of tolerance equipment's serial number. Residual stock from the same batch, if any, is rechecked using equipment verified to be accurate and proper disposition is made based upon results.
- 14.6 Calibration procedure is in accordance with WI-760-01 – Calibration and ANSI Z540.3
- 14.7 Lighting controls shall be a minimum 100 ft/candles at inspection surface.
- 14.8 Lighting intensity shall be verified with calibrated instrumentation.
- 14.9 Records of verification shall be maintained at a frequency of two (2) times per year

15. NONCONFORMACE PRODUCT

- 15.1 Product that has left QNP Inc. quality control system and is known or suspected to be Nonconforming will be handled as per OP-830-01 (Control of Nonconforming Product), additionally; that shall be reported to UTC procurement personnel. This notification report shall be made within 24 hours or the next business day after the defect was found. The reports shall be transmitted in a manner directed by UTC, and shall include, as a minimum, the part number, article nomenclature, the nature of the defect, and any other information necessary to isolate and control all articles involved.
- 15.2 Containment actions shall remain in place until corrective action is implemented and proven effective.

15.3 As part of the corrective action process for non-conforming products shipped to UTC, QNP Inc. will impose ASQR-01 paragraph 8.3. ASQR-01 paragraph 8.5.2(f) will require QNP Inc. supplier to do 100% inspection of the rejected characteristic(s) on the next three consecutive lots.

15.4 Articles deemed scrap will be handled as indicated in OP-830-01 (Control of Nonconforming Product). Articles deemed scrap must be clearly identified and rendered unusable within 30 days of final disposition unless otherwise instructed, in writing, by the applicable Member.

15.5 Nonconforming product that can be reworked to meet all product requirements within the existing manufacturing process are not required to be submitted to Member for disposition.

15.6 All rework shall have documented work instructions

15.7 UTC Member Company must approve prior to any shipments made.

15.8 In the event of a significant escape, repeated escapes or concessions, Member may assign Key Characteristic requirements as specified in UTCQR 09.1

16. Records

16.1 All electronic records are to be retained, retrievable and readable on storage media capable of maintaining the data integrity for the full retention period.

16.2 Corrections to the records are to be recorded, dated, and traceable to the qualified person making the change using a permanent marking method with original data being legible and retrievable after the change

16.3 The retention periods for the records pertaining to the following part types are as follows:

- All Tier 1 (e.g. UTC Member Company) records – 10 years
- Manned space program hardware – 30 years
- All other quality records will be maintained as indicated in OP-424-01 (Control of Quality Records).

16.4 Types of Quality Records and retention periods are to be maintained within FM-423-01, Master Document List

17. Control of Software

17.1 Control of Software is per ASQR 07.5.

17.2 Coding standards shall be defined and include but not limited to:

- Software naming conventions (e.g. modules and executable software)
- Naming conventions including developmental and production file names
- Header information with unique identifier and revision as a minimum

17.3 Changes in code shall trace to requirements. The change history for modifications shall be documented in the program header or supporting version control system.

17.4 Provide the operator (Test, Manufacturing or Engineering) with the ability to verify that the correct software has been loaded. This can be done by verifying the following type of software identification software:

- Name or unique identifier
- Version
- Date
- Time

17.5 CMM program verification phase – Prior to releasing the software to production the following applies:

- All verification or test documentation, including results, shall be retained (e.g., electronically or manually) and placed under configuration control as objective evidence that “Verification” or “Test” has been performed prior to production use
- Software for automated inspection (CMM) shall be verified by correlation of the test results with the results from an independent method of inspection (e.g., Optical Comparator, Micrometer, Caliper, etc.)
- For Pratt & Whitney end use product, acceptable correlation requires the difference to be within 10% of the tolerance for each characteristic.
- Variable data will be recorded within File Maker database “Program Verification”
- A different person other than the person who created the CMM program shall perform the verification.

18. Product Verification Testing

18.1 On an annual basis the Quality Manager will select, at random, a sample piece of raw material to be sent out to an approved laboratory for verification.

18.2 At a minimum the testing shall include the following:

- Material Specification, Revision, Designation or Type
- Temper (if applicable)
- Testing Specification
- Request for Chemical Analysis
- Request for Mechanical Properties identification (e.g. Hardness, Tensile, Yield Strength, etc)

18.3 Accreditation by either Nadcap, American Association for Laboratory Accreditation (A2LA) or by signatories to the International Laboratory Accreditation Cooperation (ILAC) is required for materials testing laboratories

18.4 All special process suppliers shall be Nadcap accredited for the following special processes:

- Chemical Processing
- Coatings
- Heat Treating
- Material Testing Laboratories
- Nondestructive Testing

19 Control of Work Transfers

19.1 Control of work transfers is applicable to QNP and its supply chain when the following occurs (but is not limited to):

- Manufacturing location changes
- Changes in a Sub-Tier's manufacturing location (i.e.: address change)
- Change in sub-tier supplier.
- Location of machine that impacts or affects Fit, Form or Function

19.2 When applicable QNP will request and obtain approval from UTC Members using ASQR-01 Form 4 prior to any planned work transfers.

19.3 For Pratt & Whitney Canada, PWC Form 11165 shall be used to document Control of Work Transfer.

19.4 QNP shall submit PWC Form 11165 to PWC SQAR and if applicable: resourcingrequest@pwc.ca for approval.

19.5 QNP shall notify UTC Member thirty (30) days or more prior to any planned change implementation.

19.6 QNP shall verify the conformity of the work to internal, customer, and/or industry standard requirements during receiving inspection.

20 RELATED DOCUMENTATION

- OP-830-01 (Control of Nonconforming Product)
- OP-824-02 (Tier 1 Inspection Procedure)
- OP-424-01 (Control of Quality Records)
- FM-423-01 (Master Document List)
- WI-760-01 (Calibration Work Instructions)
- AS13000 (Problem Solving Requirements for Suppliers)
- AS13001 (Supplier Self Release Training Requirements)
- AS13003 (Measurement System Analysis Requirements for the Aero Engine Supply Chain)
- ASQR-01 (Supplier Quality System Requirements)
- ASQR 07.5 (Control of Software)
- ASQR 15.1 (Handling, Storage, Packaging, Preservation and Delivery)
- ASQR 20.1 (Supplier Sampling Requirements)

REVISION HISTORY

REV	CHANGE DESCRIPTION	REVISED BY	DATE
C	REVISED TO UPDATE PARA 6.11 TO MEET ASQR20.1	ANDREW ADAMS	4/12/17
B	REVISED TO MEET THE REQUIREMENTS OF ASQR-01 REV 10	ANDREW ADAMS	3/27/2016
A	FIRST ISSUE	ANDREW ADAMS	5/4/2015

Appendix 1 Switching Rule Chart

