Precision Air & Land Systems

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Title:	Requirements for Suppliers to Ultra Electronics Precision Air & Land Systems ***(for JSF Pratt & Whitney Product Related Suppliers)***
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AMENDMENT RECORD

Issue	Reason for change	Date
1	Formal Issue	Jan 2014
2	Addition of Para 2.4 Quality Management Systems requirements for Stockists	Nov 2014
3	Minor text changes for clarification which include: Section 3.2 introduced. Paragraph numbering re-aligned. Change Request BMC026-15 refers.	Mar 2015

Security

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1. INTRODUCTION

1.1 Scope

This document defines the methodology, policies, objectives, quality assurance (QA) requirements and approval process employed at Ultra for the selection and control of suppliers for the Pratt & Whitney JSF Programme.

This document should be read in conjunction with PUR-SOPS 003 – requirements for Suppliers. Where conflict arises between this document and PUR-SOPS 003, this document will take presidence. Where conflict arises between this document and the purchase order; the Purchase Order will take precedence.

1.2 Purpose

The purpose of this document is to specify the Pratt & Whitney specific requirements for Suppliers of products or services against an Ultra purchase order furnished for used on the JSF EIPS Programme.

1.3 Definitions

All definitions used within this document are as referenced within BS EN ISO 9000:"Quality management systems – "Fundamentals and Vocabulary" latest revision, with the exception of the following:

Purchase Order

The documentation used by the purchaser to procure products, goods or services.

Item

The subject matter on the purchase order

Proprietary Equipment

Any item where Ultra does not hold or have claim to the intellectual property rights.

First Article Inspection

A complete, independent and documented physical and functional inspection process to verify that prescribed production methods have produced an acceptable item, as specified by engineering drawings, planning, purchase order, engineering specifications, and/or other applicable documents.

Concession / Waiver

Is permission granted after manufacture or in service, to use or release a product that does not conform to specified requirements?

It also covers written authorisation obtained prior to manufacture, or provision of a service, or a specific departure from requirements, for a specified quantity of items or period in time.

Supply Chain Team

A team comprising of representatives from Purchasing and Quality who work with the supplier.

Certificate of Conformity

A formal document issued by the suppliers authorised representative that provides relevant information pertinent to the item(s) supplied pursuant of the purchase order.

Contractor

A contractor is any firm, company or person carrying out work on the premises of any division within Ultra.

ANSI

American National Standards Institure

NCSL

The National Conference of Standards Laboratories

CNC

Computer Numerically Controlled

COTS

Commercial Off The Shelf

2. APPROVAL PROCESS

2.1 Suppliers and all members of their supply chain must as a minimum have a management system that meets the requirements of ISO9001:2008.

2.2 Suppliers or any members of their supply chain that only provide special processes (not part manufacturing suppliers) may be accredited to Nadcap AC7004 in lieu of ISO 9001:2008 or other Management System

2.3 Suppliers shall permit Ultra access to all data in OASIS and Nadcap Databases including registration documentation, certification, audit reports, findings, corrective actions etc. Ultra reserve the right to input significant and/or frequent escape data and major audit findings regarding suppliers into the relevant OASIS database records for those suppliers.

2.4 Stockist Distributors or organisations carrying out the purchase, storage, splitting and sale of products without affecting product conformance shall be certified/ registered to AS/EN/JISQ 9100 or Quality Management Systems - Aerospace Requirements for Stockist Distributors AS/EN/JISQ 9120

3. NORMATIVE REFERENCE

3.1 It is the resposibility of the supplier to ensure they are working to the latest version of any specifications referenced in this document as well as purchase order requirements, unless the issue is mandated by the purchase order.

3.2 The supplier shall complete Compliance Matrix PUR-FORM-009 then return to UEPALS purchasing Department.

UEPALS Purchasing will then use the supplier response to populate the supplier compliance log.

3.3 Requests for specifications that are needed shall be requested from the Ultra Procurement Team

4. COMPLETION OF CONTRACT

On the completion of a contract, all technical data, such as drawings, specifications etc. supplied in support of the contract should be securley destroyed or returned to Ultra for secure disposal.

5. COMPETENCE TRAINING & AWARNESS

5.1 Procedures shall be implemented to ensure that eye examinations, including visual acuity and colour vision are administered by a medically qualified/trained person to all personnel performing visual inspection and/or product acceptance activities that require visual acuity as follows:

- Intervals should not exceed 1 year
- Individuals shall be tested in at least one eye either corrected or uncorrected
- Colour perception testing is required one time only. Individuals shall be capable of adequately distinguishing and differentiating colours used in the method for which certification is required, the process being performed or the inspection activity
- Records shall be retained for each individual

Individual performing …	**Individual performing …**
Visual inspection (i.e. calibration, non-weld, in-process, layout, dimensional)	Near vision requirements of • Snellen 14/18, (20/25), • Jaeger 2 at not less than 12 inches
Visual Inspections on Welds	American Welding Society Standard (AWS) D17.1
Nondestructive Testing (NDT)	Aerospace Industries Association National Aerospace Standard (AIA/NAS) 410
Note!: *Vision tests may be substituted for the options listed above providing the equivalence is verified and documented by a licensed optometrist.*	

6. PURCHASING

6.1 When specified on the drawing or purchase order, suppliers must use only sources approved by Ultra and/or their customer to perform special processes. For a list of approved sources contact Ultra Procurement Team

6.2 All sub contractors & suppliers must be included on the latest issue MLA to work on Pratt & Whitney product

Note! The use of directed sources does not relieve the responsibility for subcontractor control (i.e. an approved source for Non Destructive Testing, Plating, coating etc.)

6.3 Non Destructive Testing should be carried out in accordance with Pratt & Whitney Specification VIM Master D – No Destructive Test

7. VERIFICATION OF PURCHASED PRODUCT

7.1 Suppliers must provide raw materials test reports / certification results / laboratory analysis requirements (e.g., tensile strength, stress rupture, hardness, chemical composition, etc.), as defined by the drawing and/or the purchase order.

7.2 Where the supplier utilizes test reports to verify purchased product, the data in those reports shall be acceptable per applicable specifications. The supplier shall periodically validate test reports for raw material.

7.3 Suppliers and all members of their supply chain shall use approved suppliers when a specific material or manufacturing special process is identified by Drawing or Purchase Order. Suppliers and all members of their supply chain that only provide special processes (not part manufacturing suppliers) must be Nadcap accredited for the following special processes:

- Brazing
- Chemical Processing
- Coatings
- Heat Treating
- Materials Testing
- Nonconventional Machining
- Nondestructive Testing
- Shot Peening
- Welding

Nadcap requirements may be further defined by Ultra or their customer.

Note: *Nadcap accreditation is not required for materials testing laboratories with American Association for Laboratory Accreditation (A2LA).*

8. MEASUREMENT & TEST EQUIPMENT (M & T E)

8.1 The supplier shall generally select M&TE with an accuracy ratio of 10 to1 (product tolerance to M&TE tolerance) however, accuracy ratios as low as 4 to 1 are acceptable, unless otherwise specified.

Use of M&TE with accuracy ratios less than 4 to 1 are not permitted unless a detailed measurement uncertainty analysis in accordance with ANSI/NCSL Z540.3 indicates an uncertainty ratio of 1.5 to 1, or better, and the measurement process is maintained under statistical quality control.

8.2 When functional performance / test data is required, include the following minimum requirements:

- Test specification number, revision status, amendment number and addendum.
- Part number / serial number and revision letter of material / component being tested.
- Test paragraph, required reading, actual reading (use positive statement, e.g., "No Leakage" if actual reading is not quantifiable).
- Date test was performed.
- Operator identification.
- Inspection approval signature / stamp.
- Blank entries that are not applicable shall be noted "N/A".

9. VISUAL INSPECTION

Visual Inspection of finished product should be carried out in accordance with the following Pratt & Whitney Specifications as applicable:

VIS Master – Visual Inspection Standard
VIS – 517 – Quality Standard - Sheet Metal Bracket Details and Assemblies

10. NON DELIVERABLE SOFTWARE

Non–Deliverable Software – The supplier shall have procedure(s) that address the following minimum requirements:

10.1 Organizational responsibility and authority including product and process integrity.

10.2 Identification of requirements:

- Define the purpose or function of the software
- Define the requirements and how the software requirements are initiated, documented and approved

10.3 Define Coding standards:

Naming conventions including developmental version production file names.

- Software Version
- Header information
- Comments

Note!: *The preferred method is to segregate the production software from the test and development programs.*

Note!: *In cases where the library contains production, test and developmental software programs, there shall be a unique identifier assigned to distinguish the three types {e.g., CMM_V1_dev, CMM_V1_test, and CMM_V1_Prod etc.}.*

10.4 Verification and Validation to include:

- Define the Verification and Validation process.
- Test procedure or test description and results shall be documented, reviewed and retained.
- Provide objective evidence that the software performs its required function.
- Trace software to requirements.
- Inspection review and approval of software must be performed by someone acting in an acknowledged product integrity role. Software used to verify quantitative values (e.g., CMM, etc.) requires an independent method of validation (i.e., layout inspection, fixture check or comparison with another CMM program previously verified by an independent method) and correlation of the two sets of results.
- Acceptable correlation requires the difference to be within 10% of the tolerance for each characteristic. Differences greater than 10% but not exceeding 25% may be acceptable with documented justification.
- Differences greater than 25% are not acceptable.
- Variable data shall be recorded and retained.

10.5 Target Environment:

- Identify interfaces to other software and to target computer hardware.
- Identify the target computer hardware and software environment.

10.6 Version Control:

- Uniquely identify each version of the software.
- Identify each item that makes up a software product.

10.7 Change Control:

Define the software change process. This includes, but is not limited to:

- Identifying problems.
- Analysis for problem cause
- Implementation and verification of corrective action
- Re–verification and re–validation of software shall be employed to ensure that the modified software meets the changed requirements.

10.8 Access Control:

Limited access control shall be defined and implemented. Examples of such controls include:

- Read and write access of the master and copies.
- Edit Key restrictions (e.g. NC, CNC Machine, etc.).

10.9 Archiving, Backup and Recovery:

- Define the process used to prevent the use of obsolete software programs. Software that is no longer required for production shall be restricted and/or removed from all systems so it is no longer available for use.
- Master copies, duplicates, and user copies shall be restricted and/or removed from all areas except the archive.
- Obsolete software in the archive shall have restricted access to prevent unauthorized use.
- Master copies shall be stored in a secure location.
- Software programs shall be archived in a manner that allows retrieval of all released versions of software programs for traceability purposes.

10.10 Identification, Storage, Handling and Release:

Define the method for identification, storage, handling and release of software to the user. The end user shall only access the latest software program version.

Note!: *Multiple software programs may be stored in machine memory (e.g., NC, CNC, etc.) however, it is not recommended since the wrong software production program may be used. It is strongly recommended that only the production software program, in use, be stored in machine memory.*

10.11 Define training and maintenance requirements.

10.12 Documentation

- Define required documentation for software development.
- Define approval requirements for software being released to production.

10.13 Define the process of supplier oversight (i.e., audit and product acceptance).

10.14 Define the process used to accept Purchased or Vendor Supplied software (COTS) prior to initial use.

10.15 Analysis of Risks and Criticality as applicable.

10.16 Software Support Tool Development Process:

- Define the software requirements and document them in the program folder or equivalent.
- Design and code the software and document the activity in the program folder or equivalent.
- Execute a functional test of the software and document the activity in the program folder or equivalent.
- Control the Software and documentation using internal configuration management procedures.

10.17 Define the internal audit or review processes for software to ensure compliance to established software development, procurement and control procedures.

11. FOD PREVENTION

11.1 The requirements for Foreign Object Damage/Foreign Object Debris (FOD) prevention are based on the National Aerospace Standard (NAS) 412, Foreign Object Damage/Foreign Object Debris Prevention, which establishes a baseline FOD prevention policy/procedure. NAS 412 supports the quality management system standard, AS/EN/JISQ 9100/9110/9120 which requires suppliers carry out a program for the prevention, detection, and removal of foreign objects from its products.

11.2 The minimum requirements of a FOD Prevention Program for all product/service suppliers shall include:

a. A FOD training program shall be in place to increase employee awareness on causes and effects of FOD, promote active involvement through specific techniques and emphasize good work habits through work discipline. FOD training is required for all employees and contractors (internal and external) as applicable and shall be on going, (i.e., initial and periodic) to maintain employee awareness.

Training shall include (but is not limited to) the following topics:

- Causes and effects of FOD
- Protection of product
- General housekeeping program and formal 5-S practices
- Clean as you go principles
- Tool control/accountability
- Unrestricted hardware control/accountability
- Consumable control/accountability

b. A documented procedure for material handling and part protection to eliminate potential FO/FOD and handling hazards that includes:

- Risk identification for sensitive parts, assemblies, surfaces, areas, etc.
- Risk identification related to packaging, handling, shipping and storage processes.
- Evaluation and controls for risk mitigation specific to cleaning, protection, and care processes.

- Defined process sequencing that allows for proper contamination prevention, cleaning, and detection on parts and containers at appropriate process points.
- Defined methods to protect parts where contact with other elements may be detrimental to the part (e.g., columbium, titanium, magnesium, etc.).

c. A general housekeeping program and formal 5-S practices that includes:

- Area cleaning in accordance with 5-S principals (i.e., assembly, test, manufacturing, warehouse, and operational support areas).
- Periodic cleaning/sweeping floors, work-surfaces and any other pertinent surfaces.
- Maintaining critical process areas free of open food and beverages.
- Areas having clear signage indicating requirements.

d. A FOD reporting and investigation process shall be in place and define how to:
- Report and investigate FOD occurrences and include the use of common root-cause analysis tools as part of the record.
- Advise personnel of how to react in the event of a FOD incident, (e.g. do not disturb evidence, cease operation, immediately notify supervision, begin investigation, etc.).
- Ensure effectiveness of corrective/preventive actions taken to preclude recurrence.

e. Storage controls shall include:

- Facilities, as necessary, provide isolation/protection to material pending use or shipment.
- Periodic assessment of the condition of material in stock.
- "First in - First out" issuance of materials subject to degradation.
- Shelf life control applied to processing material, as required.

f. Preservation and Packaging controls shall include:

- Preservation of material during processing, fabricating, assembly and testing, through shipment of end items.
- Regular preservation fluid checks for contamination and maintained free from FO via filtering or replacement of preservatives.
- Visual inspections prior to final preservation to ensure parts are free from contaminants, debris, foreign material, finger marks and stains. When required, a bore scope examination shall be carried out to ensure freedom from machining chips and debris for internal passages that cannot be inspected visually.
- Prevention of oil system contamination from silicone-based lubricants.
- External cleaning when there is evidence of external contamination.
- Packing material does not induce contamination to parts and assemblies.

g. Prohibited packing material is not used. This includes, but is not limited to:
- Newsprint
- Loose packing material small enough to block internal passages, holes and crevices or parts
- Glue bearing material

h. Packing methods consider weight, physical configuration, and method of shipment to preclude damage to parts.
i. For UTC Member drawings that do not include special preservation instructions:
   - Castings made of low alloy steel, plain carbon steel, ductile iron or martensic stainless steel shall be preserved prior to shipping using oil per MIL-L-2104 or equivalent.
   - Magnesium alloy castings may be preserved prior to shipping using UTC member approved preservation oil instead of AMS 2475 pickle when called for. Contact the appropriate UTC member, if necessary.
   - Overhaul and repair material shall be preserved in accordance with the applicable approved technical data.

j. Optical systems, electrical components or assemblies containing cadmium, lead, zinc or magnesium are not protected with Vapor Corrosion Inhibitor (VCI) treated materials.
k. Protection against corrosion and damage during transit or storage and state the duration of effectiveness of such preservation and packaging, as required by applicable regulatory agency

12. PACKAGING & SHIPPING

Shipping and protective Closures should meet the requirements of Pratt & Whitney Specification PWA381 – Shipping & Protective Closures

Complete packing slip/shipping label per instructions shall be provided on the Purchase Order (P.O.) or Dispatch Paperwork. Information shall include:

- Packing slip number
- Supplier name
- P.O. number
- Line item number (if applicable)
- "Ship to" address
- Part Number nomenclature
- Serial Number where applicable
- First lot shipped when applicable
- First Article Inspection applies when applicable
- Reference to any non-conformance documents
- Country of Origin

13. ELECTROSTATIC DISCHARGE (ESD) CONTROL

- Where applicable, institute adequate procedures and controls to prevent damage to electronic equipment and components which are sensitive to ESD.

- Provisions shall be made for protection of electronic and electrical material which is sensitive to electronic discharge (ESD), per MIL-STD-1686 or for overhaul and repair applicable approved technical data.

- ESD control requirements apply where equipment containing ESD sensitive parts are used during the process of fabrication, calibration, testing or packaging of the end item, whether or not the end item is ESD sensitive.

14. ADDITIONAL SPECIFICATIONS

The supplier should be cognisant of the following Pratt & Whitney specifications however the control of these requirements are incorporated into the Ultra drawings and documentation supplied with the purchase order:

- POP 1614-BC - Supplier Requirements for Preservation and Specialized Packaging
- PWA 300 - control of materials, processes and parts
- PWA 373 - Interpretation of computer graphics files for product definition
- PWA 328 - design requirements for product materials of concern