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Code 01: Quality System Requirements

- A. Deleted
- B. Quality system must conform to the current revision of General Electric S-1000.
NOTE: Parts manufactured under this PO are for GE end use.
- C. Quality system must conform to the applicable section of General Electric S-1000 (Heat Treaters). NOTE: Parts manufactured under this PO are for GE end use.
- D. Quality system must conform to the current revision of General Electric S-1000 and S-400 (metallurgical test labs). NOTE: Parts manufactured under this PO are for GE end use.

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- E. Quality system must conform to the current revision of Pratt & Whitney ASQR-01. NOTE: Parts manufactured under this PO are for UTC end use.
- F. Quality system must conform to the current revision of Boeing quality management system D6-82479. Must comply with Boeing document D1-4426 "Approved Process Sources".
- G. Quality system must conform to the requirements of NCA 3800.
- H. Quality system must be approved by CFW quality department
- I. Deleted
- J. Quality system must conform to the current revision of AS9100 and/or ISO 9001:2008.
- K. Quality system must conform to the current revision of Rolls Royce SABRE.
- L. Deleted
- M. Must be Nadcap approved and/or customer approved (applies to processing requiring accreditation)
- N. Quality system must conform to current revision of CFW QWI 6-5.
- O. Honeywell end-use parts, supplier must include their Honeywell vendor code on certificates of conformance and/or test reports and must conform to SPOC Manual and SPOC number referenced on the PO (when applicable).
- P. Quality system must conform to the current revision of Safran GRP-0087. NOTE: Parts manufactured under this PO are for SNECMA end use.
- Q. Safran specs incorporation time must be as soon as possible with 1-year allowable maximum time.
- R. Deleted
- S. The organization shall plan, implement, and control the processes needed to assure product safety during the entire product life cycle, as appropriate to the organization and the product.

The following notes apply in addition to the above referenced alpha code for quality system requirements.

QMS Certification Requirements: Make to print and design and manufacture suppliers must be AS9100 registered, Distributors must be AS9120 registered, Special Process suppliers must be Nadcap or Customer requirements, Raw Material suppliers must be ISO 9001 or AS9100 registered, and External Calibration or Laboratory suppliers must be ISO/IEC 17025 or National Equivalent, e.g., UKAS, COFRAC, NIST.

Data: All data will be available in the English language. No data or information pertaining to orders will be discussed or released to any person or entity without written approval by the procurement representative.

Work Transfer: No subcontracted work from CFW shall be subsequently subcontracted to another sub-tier supplier without prior approval from CFW.

Right of Entry: CFW, its customers and their respective governmental and regulatory agencies, third parties mandated by the customer and contracting parties accompanying the customer's representatives

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including access to documented information and the ability to conduct audits, review of quality investigations, and to verify product and processes. Right of entry includes access to the applicable areas of organization facilities as well as related supplier and business partner facilities.

Sampling: Sampling of GD&T inspection and NDT inspection is not permitted to fulfill drawing or specification requirement, unless approved by the customer. This does not apply for information only inspections.

Communication: Suppliers shall only accept privileges, agreements, and instructions in writing (e.g., Interface Documents, purchase order, purchase order supplements/amendments). Verbal agreements and instructions shall not be construed as CFW approval or authorization. Supplier shall agree with CFW the method of formal communication (e.g., for approval, authorization, agreement) to be used and the applicable traceability requirements such as proforma, coordination memorandum, etc. Supplier shall provide access to data within OASIS and Nadcap databases (e.g., registration documentation, certification, audit reports and findings, corrective actions) to its customers.

Change Notification: CFW shall be notified within 3 working days of becoming aware of an issue regarding the following:

- Change to the supplier's name address, tooling, facilities, materials, or processes. This includes, but is not limited to, fabrication, handling, inspection, acceptance, or testing.
- Major incidents affecting the organization that impact the organizations ability to meet customer commitments.
- Risks that could impact the continuity of the organization's business/operations, particularly single points of failure.
- Changes to third party or other party QMS Certification including, lapse/withdrawal/major audit findings to the relevant customer and registration, or accreditation.
- Change of the nominated quality representative, (usually the most senior Quality Leader within the organization).
- Significant change to the Quality Management System.
- Change in ownership or discontinuation of business activities.
- Significant issues of breaches of Information Technology (IT) security systems (Cyber Security).
- Risks with the supply of substances used in the production or physical make-up of products, due to laws and regulations concerning the control or use of such substances that may be published from time-to-time.

Record Retention: All records of special process shall be retained for a period of 50 years. Conventional machining is not considered a special process, retention period is seven years. Retention periods for all other suppliers shall be per applicable customer and/or regulatory requirements.

Document Revision Control: Supplier shall work to the latest revision of all listed specifications, reference specifications, and customer specific procedures/forms/templates where specified and agreed with CFW.

NOTE: CFW will state on the purchase order to work on the specified revision and not to the latest revision when required by customer and/or fixed process.

Nonconforming and Product Safety: Supplier shall inform CFW within 24 hours of discovery of shipped suspect nonconforming product (see Code 11) and/or anything that can affect the product's safe and reliable operation identified at any stage in the product's life.

Lot Traceability: Supplier shall have a process to verify the correct metallic raw material is used when issued for production or concurrent with the start of the first operational process step. The intent of the

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requirement is not to measure or control the manufacture of raw material but to ensure the material input at the part manufacturer is correct: Product with a unique identifier (e.g., serial number, lot number) are excluded from this requirement and this requirement does not apply to hardware (fasteners, bolts, nuts) or standard components at the point of assembly.

Foreign Object Debris: Supplier shall maintain a FOD Prevention Program in accordance with Aerospace Standard AS9146, Foreign Object Damage (FOD) Prevention Program - Requirements for Aviation, Space, and Defense Organizations.

Counterfeit Product: Quality system must plan, implement, and control processes, appropriate to the organization and the product, for the prevention of counterfeit or suspect counterfeit part, materials, and services, per AS9100, AS5553, ARP6328, AS6496, DFARS 252.246-7007, IDEA-STD-1010, DFARS 252.246-7008, AS6174, AS6081 and/or AS6171, NAS-412, D6-85622, as applicable. CFW must be notified of all shipped suspect counterfeit parts and/or material within 24 hours.

Certification Requirements: Supplier certifications shall contain the following information at a minimum:

- Carlton Forge Works Shop Order number
- Date
- Applicable procedures and revisions
- Applicable specifications and revisions
- Applicable amendments
- Quantities
- Serial numbers (if applicable)
- Heat numbers/Heat Codes (as applicable)
- Reference to CFW customers' documents and procedures (when applicable)
- Details of the procedure (temperatures, times, etc.)
- Mercury Contamination Statement: *Material on this purchase order shall not come into contact with mercury or mercury bearing instruments which are not shielded with a double barrier.*
- Necessary surveillance stamps (as applicable)
- Title and signature of authorized official
- Heat treat lot numbers (as applicable)

Material and Special Process Test results shall reflect all requirements of the drawing and/or specification and conform to drawing and/or specification limits. Documented evidence of this conformity including listing of each material element or test result in the applicable test report.

The applicable test report shall be signed by a cognizant test laboratory person, clearly confirming which of the following is correct:

- All tests and inspections have been performed and results meet the drawing and/or specification requirements, or
- All tests and inspections have been performed and the results meet all the drawing and/or specification requirements, except _____, which does not meet requirements, or
- All tests and inspections have been performed and the results meet all drawing and/or specification requirements, except test(s) _____,

Code 02: Gage and Instrument Calibration

Gage and instrument calibration system must conform to the current revision of ISO 10012 (ANSI/NCSL Z540, as applicable). For Pratt & Whitney end use, system must conform to the current revision of ANSI/NCSL Z540.

Code 03: 10 CFR 21 Requirements

The provisions of **10 CFR 21** (Nuclear Regulatory Commission Regulations, Title 10, Code of Federal Regulations, Part 21: Reporting of Defects and Noncompliance) APPLY TO THIS ORDER.

Code 04: DPAS Requirements

“THIS IS A (DX or DO) RATED ORDER. THE REQUIREMENTS OF THE DEFENSE PRIORITIES AND ALLOCATIONS SYSTEM (DPAS) APPLY.”

This order is certified for national defense use (DPAS, 15 CFR 700) and as necessary, DPAS rated orders take precedence over all unrated orders. This order must be scheduled to meet delivery dates. If you determine, during your purchase order review, that you are unable to complete the requirements of Carlton’s purchase order by the stated due date, contact CFW Planning department as soon as possible.

The DX / DO rating is as follows:

DX = HIGHEST NATIONAL PRIORITY

DO = VITAL TO NATIONAL DEFENSE

Code 05: Mercury Contamination

Material on this purchase order shall not come into contact with mercury or mercury bearing instruments which are not shielded with a double barrier.

NOTE: ALL CERTIFICATIONS SHALL CONTAIN A STATEMENT INDICATING COMPLIANCE WITH THIS REQUIREMENT.

Code 06: DELETED – Disregard if listed on PO

Code 07: DELETED – Disregard if listed on PO

Code 08: Manned Space Flight

For use in manned space flight. Materials manufacturing, and workmanship of highest quality standards are essential to astronaut safety.

Code 09: DELETED – Disregard if listed on PO

Code 10: First Article Inspection

The first article inspection report (fair) shall consist of 100% dimensional inspection for all machined dimensions including dimensional characteristics as specified on the CFW purchase order. All FAIR’s shall conform and be documented on the AS9102 format or equivalent forms approved by CFW inspection department supervisor (or designee). First article reports shall contain all applicable drawing characteristics, including dimensions and a “balloon drawing” coordinating drawing dimensions to reported dimensions, drawing notes, surface finish, out-of-round, concentricity, etc. Report must include the gage type used for measuring each characteristic (e.g., dial caliper, height gage, CMM, profilometer, etc.). Reports must be dated and signed by the person performing the inspection and verified by another person. The first article part shall be tagged “first article”.

First article report shall be approved (in writing), by CFW quality representative prior to starting the production run. A copy of the first article report shall be forwarded to CFW inspection with the completed parts.

Code 11: Non-Conformances

If at any time the sub-tier detects a process violation, purchase order noncompliance, or part nonconformance, CFW quality shall be informed as soon as possible (no more than 24 hours after detection or, for non-critical discrepancies by the next business day).

Nonconforming parts shall be segregated and tagged as nonconforming. Tags shall indicate the nature of the nonconformance.

Root cause & corrective action shall be determined and submitted in writing to CFW quality within 24 hours of detection of the nonconformance unless otherwise agreed upon by CFW quality assurance.

Sketches of tool gouge, groove and lack of fills to be provided upon submittal to CFW sketches must include measurements of nonconformance which include the depth, width and length along with measurements of the feature being violated which may include, but not restricted to measurements to datums, lengths, outside diameters, inside diameters and any relevant GD&T.

Code 12: DELETED – Disregard if listed on PO

Code 13: Statistical Process Control

Capability studies shall be conducted on all machines used to machine CFW parts. Evidence of these studies shall be maintained by the supplier for review by CFW quality representatives. Capability studies must show the machine capable of maintaining a state of statistical control and the ± 3 standard deviation capability must be used to determine the capability of a machine to hold tolerances during machining operations.

If key characteristics (KC's) are not identified by CFW, the sub-tier machine shop shall (after reviewing drawing requirements) select key characteristics to control during machining. Key characteristics shall be those most likely to determine if a part will be acceptable. Control charts shall be submitted to CFW quality with delivered parts. Maintaining a state of statistical control is not sufficient for lot acceptance. All parts in the lot must also be within blueprint tolerances.

If CFW designates key characteristics they shall be controlled per paragraph as stated above when SPC is added to the purchase order as a line item.

Producing parts within blueprint tolerance will be the short-term goal. Our long-term objective is to continually reduce variation in our processes. A Cpk of 1.33 is considered the minimum acceptable when evaluating a machining process. All sub-tiers should make this their goal.

Each machining supplier shall document their SPC system. Elements of the system should include but not be limited to training, software used, planned integration of SPC methods into planning, manufacturing, and quality assurance operations and current shop floor implementation status. Any significant changes to the system should be documented and sent to the CFW quality manager.

Code 14: Lab Test Data Control (GE)

This applies to CMTL'S for GE end use parts.

S-400 applies to this order.

Current GT193 is required prior to testing on this order. Current GT193 shall be sent to CFW upon receipt.

NOTE: Effective 6/23/93, S-356 no longer applies to CFW test plans. All retest requirements shall comply with S-400.

Code 15: DELETED – Disregard if listed on PO

Code 16: Software Quality Assurance

Subcontractor's software quality assurance system shall be based upon current customer, end user, and government specifications. Confirming compliance with Export Control and Classification requirements.

The subcontractor shall have a system for software control process requirements and is responsible for defining and documenting the process, maintaining records, approvals, training, and providing applicable objective evidence. Objective evidence must be maintained for requirements definition, validation testing (release test), approvals, *coding guidelines (as applicable for the type of software used i.e., naming conventions, comments, etc.), revision control, and traceability. The following guidelines apply.

- a) Define the purpose and function of the software and how software requirements are initiated, documented, and approved.
- b) Identify naming convention, modification, and comments (coding) guidelines. Documentation and approval is required for a release test.
- c) Define the process, documentation and approvals used to ensure requirements are met. Ensure software cannot be modified without authorizations.
- d) Define the process documentation and approvals required for release to use. Provide objective evidence that the software performs its required function prior to use. (Objective evidence requires recording and retaining variable data.) Inspection, review, and approval of software responsible for finished part features must be performed by someone acting in an acknowledged product integrity role. Part specific software used to verify quantitative values requires an independent method of validation, 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% can be acceptable with documented justification. Differences greater than 25% are not acceptable).
- e) Define the process and approvals required to control software and related documentation, including revisions and identification for traceability purposes.
- f) Define the process used to approve/accept software into various libraries, control access and provide for backup and recovery. Master versions must be located in a secure location.
- g) Define the process of software verification for automated inspection (e.g., CMM) by correlation of the test results with the results from an independent method of inspection.
- h) Identify the method for storage, handling, and release of software to the user.
- i) Define the process for internal audit (oversight), identifying risks, criticality problems, analysis for problem cause, implementation, and verification of corrective action.

- j) Define the process for the management of pre- production and production tooling, jigs and fixtures that includes (but is not limited to) the following: *Unique tool identification, validation of tool prior to release for production, protection from damage and deterioration during storage, maintained as fit for purpose, storage and recovery, tool set-up, tool life control/tool-change programs, tool design modification documentation, including engineering change level, and tool modification and revision.*

Code 17: Heat Treatment/Instrumentation

- A. Subcontractor must comply with and certify to the current revisions of Pratt & Whitney/Pratt & Whitney Canada MCL manual sections F-22/FC-22 and F-40/FC40.
- B. Aluminum subcontractor must comply with and certify to the current revision of AMS 2772 & AMS 2750.
- C. Iron, nickel & cobalt alloys subcontractor must comply with and certify to the current revision of AMS 2750 (and AMS-H-6875 for iron alloys only).
- D. Titanium subcontractor must comply with and certify to the current revision of AMS-H-81200 & AMS 2750.
- E. Subcontractor must comply with and certify to the current revision of RRP 54000 (Rolls Royce).
- F. Deleted (Reference Quality Code 01m).
- G. If subcontractor must use more than one heat treat load to process any purchase order, it is required that notification must be made to CFW quality and written approval must be given prior to processing the order.

If CFW quality/metallurgy dispositions that split loads are acceptable, then forgings from a CFW discrete jobs must be run consecutively unless otherwise specified. Certification specific to the CFW discrete job shall include a statement that loads were run consecutively, and which S/N belong to each load.

Part shall not be stacked or nested for any heat treat cycle, unless otherwise specified by CFW quality or metallurgist in writing.

Code 18: Test/Calibration Requirements-CMTL's (P&W)

Subcontractor must comply with and certify to the current revision of Pratt & Whitney/ Pratt & Whitney Canada MCL manual section F-23/FC-23.

Code 19: DELETED – Disregard if listed on PO

Code 20: DELETED – Disregard if listed on PO

Code 21: Customer Source Inspection

Customer source inspection/witness is required on this purchase order. Contact the CFW quality/metallurgy department as soon as possible but no less than 48 hours prior to performing services as required by the purchase order to arrange for source inspection/witness of operations.

Code 22: Government Source Inspection

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Government source inspection/witness is required on this purchase order. Contact the government source inspector assigned to your facility 48 hours prior to performing services as required by this purchase order to arrange for source inspection/witness of operations.

Code 23: Purchase Order Review

If during the purchase order (PO) review the sub-tier determines that the requirements of the PO or process sheet cannot be met, the sub-tier must first notify CFW outside processing or quality/metallurgy department as applicable, and secondly prior to processing, obtain revised PO and/or instructions, in writing, stating services to be performed that are within capabilities of the sub-tier.

Sub-tiers are responsible for obtaining applicable specification and/or engineering drawing revisions as referenced on the CFW PO. Sub-tiers are to contact CFW outside processing or quality to obtain required specifications and/or engineering drawings; or when applicable, the sub-tier will be required to obtain specification revisions directly from the end use customer (e.g., when specification revisions are available via electronic transfer). Work on PO's shall not begin until all required documents are received and adequately reviewed by the sub-tier.

If sub-tiers have been furnished with a supplier code/number by a prime contractor, this number shall appear on all certifications, as applicable. If sub-tiers have been furnished with a controlled stamp by a prime contractor, all copies of certifications shall be stamped, as applicable.

If you do not have a current customer (prime contractor) approval in your possession that authorizes you to perform processes as required by this PO, contact CFW quality prior to performing any work on this PO. NOTE: This applies to special processes, metallurgical testing, and machining to final part requirements.

Code 24: DELETED – Disregard if listed on PO

Code 25: Fixed Process Requirements

This is a FIXED PROCESS. No changes to the process or purchase order are allowed without the written approval of CFW Quality/Metallurgy.

Code 26: DELETED – Disregard if listed on PO

Code 27: Process Certification Program

A process certification program, approved by the CFW quality, shall be in place as a condition of this purchase order. This shall serve to flow-down applicable customer requirements as they relate to process certification.

Code 28: DELETED – Disregard if listed on PO

Code 29: Test Piece Marking Instructions for CFW Laboratory Outside Processing

This Quality Code shall appear on the shop traveler to specify the marking instructions for test material. Reference the following from QWI 16-3.

Marking: All test samples being stored shall be marked with the following for traceability.

- Discrete Job number

- Heat number
- Serial number
- Heat Treat Lot number, if required
- Date
- Grade of Material

Marking Method: Material shall be marked by one of the following methods:

- Permanent marking
- Vibro Peen
- Steel stamp

NOTE: Test material for with a retention requirement of +30 years or permanently must be steel stamped or vibro peen method.

Code 30: Terrorist Financing

Subcontractor shall comply with Executive Order 13224 - executive order on terrorist financing - blocking property and prohibiting transactions with persons who commit, threaten to commit, or support terrorism, effective 09/24/2001 and any subsequent changes made to it.

Text of executive order can be found at <https://home.treasury.gov/>

Code 31: U.S. Export Law Compliance

To ensure compliance with U.S. Export Control Laws, CFW does not conduct any business transactions with persons or companies on the denied persons list published by the U.S. department of commerce, the debarred parties list published by the department of state, and the specially designated nationals published by the department of treasury, foreign assets control.

Text of this can be found at <https://www.trade.gov/us-export-controls>

Code 32: Fraud and Falsification

The recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal statute.

Code 33: ESA Fix Process Requirements (PWA 370 & CPW 135)

For operations under ESA control, all individual process sheets and/ or router/ traveler that are under ESA control shall be identified with a bold statement "ESA per CPW 135 – No significant process changes permitted without CFW approval" (Pratt & Whitney Canada).

This is a fixed process. No changes to the process or purchase order are allowed without the written permission of CFW quality for Pratt & Whitney group rotor forgings, critical parts or life limited structural forgings (Pratt & Whitney America).

Code 34: Fraud Falsification (Ref: BWXT-3081 Sec.38)

- A. This order and the activities hereunder are within the jurisdiction of the department of energy or the department of the navy. Any knowing and willful act to falsify, conceal or alter a material fact, or any false, fraudulent, or fictitious statement or representation in connection with the



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performance of work under this order may be punishable in accordance with applicable federal statutes.

- B. Subcontractor agrees that all employees engaged in the performance of this purchase order will be, if they have not been previously, informed in writing prior to commencing performance of work under this purchase order that there is a risk of federal criminal penalties associated with any falsification, concealment or misrepresentation in connection with work performed under this purchase order. Subcontractor agrees that a signed statement shall be, if it has not been previously, obtained from said employees prior to their commencing performance of work under this purchase order that they have been so informed. Such statements shall be retained by the subcontractor for at least three years after final payment on this purchase order. An acceptable form for such a statement is substantially as follows: "this company/division/department/branch performs work under contracts which are within the jurisdiction of departments of the United States government. some of the work performed under these contracts affects the national security of the United States and the requirements of these contracts are designed to ensure that essential attributes of the work are carefully checked or inspected and that records accurately reflect the results of all work. any falsification, concealment, or alteration of any material fact, or any false, fraudulent or fictitious statement or representation in connection with the work under any contract within the jurisdiction of the government is not only prohibited by company policy but may also be punishable under federal law. please acknowledge by your signature that you have read and understand the above."

- C. Subcontractor agrees to include the following pre-printed statement on manufacturing work instructions, manufacturing records, inspection, and/or test forms generated by subcontractor to verify or report the performance of any work in conjunction with the subject order.

Applicable orders issued by BWXT NOG

"NOTE: the recording of false, fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal statute."

Applicable to orders issued by NFS

"Knowingly or willfully falsifying or concealing a material fact on this form, or making false, fictitious or fraudulent statements or representations herein could constitute a felony punishable under federal statutes."

- D. Subcontractor agrees to include this article, including this paragraph D, in every subcontract or lower-tier purchase order for material, parts or services under this order. Any inability or unwillingness of a lower-tier supplier to comply with this provision shall promptly be documented in writing and provided to, as applicable, BWXT NOG or NFS (**NOTE: BWXT is responsible to notify BPMI if any supplier takes exception to this clause**).

End of Quality Codes

Revision History

| Date | Revision | Description | Author |
|------------|----------|---|------------------|
| 03/29/2023 | NC | Added all quality codes to one document/link to control all clauses in one document/link. | Randy Gualajara |
| 11/14/2023 | NC | Added reference to D1-4426 to Code 01F. | Elizabeth Loiler |