COMPOSITES HORIZONS
CHQAR 1001

Title: Composites Horizons Quality Assurance Requirements (CHQAR 1001)

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1.0 PURPOSE

This CHQAR flows down the minimum quality assurance requirements for external providers who provide product, direct material, and/or services to Composites Horizons LLC. These requirements are defined to ensure the external providers maintain a Quality Management System in compliance to AS9100D, ISO 9001:2015, and AS13100 for aviation engine builders.

2.0 SCOPE

This CHQAR is applicable to products, materials, and/or services provided to Composites Horizons LLC. by approved external providers and their sub-tier providers at all levels of their supply chain when specifically referenced in a purchase order.

3.0 RESPONSIBILITIES AND AUTHORITY

VP Operations or designee:

- The purchaser invokes this specification on the purchase order when requirements are a condition of the sales order with its customer. Deviations from these requirements are subject to the written approval from the purchaser.

VP of Quality Assurance or designee:

- Ensures the quality engineering department reviews and approves the adequacy of the flow requirements issued via purchase order to the external provider.

VP of Engineering or designee:

- Ensures engineers load product requirements into the part maintenance in Visibility (ERP) for review and approval by quality engineering.
- Ensures CHI document control maintains the latest revision of documents are available for distribution to the external provider and they are legible and reproduceable.

External Provider

- Review the applicable requirements specifically applied to the product requested on the Composites Horizons' purchase order.
- Flow down specific product or service requirements to sub-tier providers at all levels of the supply chain when specifically referenced in a purchase order.

4.0 DEFINITIONS AND ABBREVIATIONS

Controlled Material/ Services – Material or services considered critical in their application or procurement, as defined by Purchaser purchase specifications. “Controlled” shall be considered synonymous with “critical”, “significant”, “fixed”, or “frozen”.

Counterfeit Material – Fraudulent materiel that has been confirmed to be a copy, imitation or substitute that has been represented, identified, or marked as genuine, and/or altered by a source without legal right with intent to mislead, deceive, or defraud.

End–User – The Purchaser’s customer.

Foreign Object Damage (FOD) – Damage to product which arises from introduction of foreign objects. The result of damage could have an effect on subsequent manufacturing operations or product safety.

Foreign Object Debris (FOd) – A substance or article alien to the product/process that could potentially cause FOD.

Material – The elements, constituents, or substances of which something is composed or can be made.

Purchaser – Composites Horizons LLC. (CHI)

Special Requirements – Those requirements identified by the purchaser or end–user, or determined by the external provider, which have high risks to being achieved, thus requiring their inclusion in a risk management process. Factors used in the determination of special requirements include product or process complexity, past experience and product or process maturity. Examples of special requirements include performance requirements imposed by the Purchaser or End–User that are at the limit of the industry’s capability, or requirements determined by the external provider to be at the limit of its technical or process capabilities.

External provider – External provider or Subcontractor, that is providing a material, detail, subassembly, product, or a service to the Purchaser.

5.0 PROCESS INPUTS, OUTPUTS, AND MEASURES (TURTLE DIAGRAM)

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6.0 PROCESS FLOW DIAGRAM (PFD)

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7.0 PROCEDURE

7.1 Contractual Intent

This specification requires the establishment of a quality program by the external provider. The quality system provides adequate assurance that this specification along with all other contractual requirements are met. The quality program shall be documented at least to the extent of these requirements and shall be subject to the approval of the purchaser.

7.2 Self-Auditing

The external provider shall establish, maintain, and document as part of their quality program, a self-evaluation system that will assure internal compliance to their procedures.

7.3 Competency

The external provider shall assure that all personnel performing work directly or indirectly affecting conformity to product or service requirements are thoroughly trained and competent in the methods and skills required to perform their tasks.

Examples:

- The proper operation of instruments, tools, and machinery used.
- Reading, and understanding the documentation provided.
- The relationship of their duties to quality and safety in the workplace, etc.

External provider shall assure proper documentation of training and retain records for the “period of employment + 3 years” after employee leaves the organization.

7.4 Relation to Other Contract Requirements

This specification shall be in addition to and not in disagreement or conflict with any other contract requirements.

7.5 Quality Management System Changes

The external provider’s Quality Management System Representative (QMSR) shall promptly notify Composites Horizons LLC. in event of any changes in company ownership, facility location, or 3rd party accreditations.

7.6 Right of Entry

The right of access by the purchaser, their customer, and regulatory authorities to the external provider’s applicable areas of facilities and to applicable documented information, at any level of the supply chain.

7.7 DO" or "DX" type DPAS rating.

If the contract specifies a "DO" or "DX" type DPAS rating, the external provider is obligated to comply with all of the relevant provisions of section 15CFR350 of the Defense Priorities and Allocation System Regulation, including flowing such rating and requirements down to all levels of their supply chain.

7.8 International Trafficking in Arms Regulations (ITAR)

If the contract, drawing, and/or specification specifies the following legend (or equivalent), the external provider is obligated to comply with all relevant sections of ITAR and/or Export Administration Regulations (EAR), including flowing such requirements down to all levels of their supply chain.

"This technical data is controlled by International Traffic in Arms Regulations (ITAR) and/or Export Administration Regulations (EAR) pursuant to 22 CFR Part 120–130 and 15 CFR Parts 730–774 respectively. Transfer of this data by any means to a Non–U.S. Person, whether in the United States or abroad, without the proper U.S. Government authorization is prohibited."

No work purchased, manufactured, or otherwise acquired for use in the performance of or to be delivered under this order shall be transported on vessels, aircraft, or other carriers leased to or from, owned, operated, or controlled by any prohibited country identified in the International Traffic in Arms Regulations (ITAR), 22 CFR 126. No vessels, aircraft, or other carrier, while carrying any such work shall make an enroute stop in any prohibited country identified in ITAR, 22 CFR 126.

7.9 Infrastructure

The external provider shall determine, provide, and maintain the infrastructure needed to achieve conformity to product and service requirements. Requirements for maintenance activities shall be documented, and records retained. External provider shall maintain an acceptable level of cleanliness to assure the prevention of foreign object debris (FOd) in compliance with AS9146.

7.10 Counterfeit Material

The external provider shall have provisions in place to prevent and mitigate risk of supplying counterfeit product or material. This includes conformance to the requirements of AS 6174. The external provider shall ensure traceability of its supply chain back to the original manufacturer.

7.11 Ethical behavior

External provider shall adhere to the minimum requirements or equivalent of the Precision Castparts Code of Conduct. The Precision Castparts Code of Conduct can be found by searching the Internet using the phrase “PCC Code of Conduct”.

7.12 Management Responsibility

The external provider’s management shall define and document its policy and objectives for, and commitment to, quality. The external provider shall assure this policy is understood, implemented, includes Human Factors, and maintained at all levels of the organization.

The external provider shall establish, document, implement, maintain, and have continuous improvement in the effectiveness of a Quality Management System (QMS). The processes needed for the QMS, and their sequence and interaction shall be defined, monitored, and measured, periodically evaluated for their effectiveness, and continually improved.

Effective management for quality shall be clearly prescribed by the external provider. Personnel performing quality functions shall have effective training and well defined responsibilities. Additionally, employees shall have the organizational freedom to identify system issues, participate in the investigation of nonconforming outputs and provide recommended solutions.

The external provider shall appoint a management representative who irrespective of other responsibilities shall have defined authority and responsibility for ensuring that the requirements of this specification are implemented and maintained. The representative shall be afforded unrestricted access to Top Management to resolve matters pertaining to quality.

Top Management shall ensure that customer requirements are determined and are met with the aim of enhancing customer satisfaction. Product conformity and on-time delivery performance shall be measured, and appropriate action taken if planned results are not, or will not be, achieved.

7.13 Initial Quality Planning

The external provider, during the earliest practical phase of contract performance, shall conduct a complete review of the requirements of the contract to identify and make timely provision for the controls, processes, test equipment, test specimens, fixtures, tooling, and skills required for assuring quality in compliance with AS9145. This includes any risk management determinations necessary due to the identification of special requirements (See 4.0 for definitions).

Records of such contract reviews shall be retained per Table 1.

Table 1

Retention Time Period (From Date of Manufacturing)	Part type
40 Years	Critical to Safety item(s)
10 Years	All other serialized Parts
10 Years	All other non-serialized parts

For certain products, services rendered, and detail items contracted for, the purchaser's work instruction will denote by reference the end-user (purchaser's customer) to whom the product will be delivered.

When specific end–user requirements necessary to satisfy technical and quality provisions are required, they will be specified in the work instruction. Those requirements may include, but are not limited to:

a) Use of end–user drawings and specifications, to the latest revision unless otherwise specified.
b) Use of end–user approved sources, including utilization of end–user provisions for approval of procedures, processes, work instructions, equipment, materials, and personnel.
c) Satisfaction of end–user product and process verification and other related instructions for acceptance.
d) Use of statistical techniques for product acceptance.
e) Handling and inspection of designated critical items, including verification of key characteristics.
f) Notification of changes in product and/or process.
g) Flow down of end–user requirements to the external provider's subcontractors.

7.14 Work Instruction

The external provider shall assure that all work affecting quality shall be prescribed in clear and complete documented instruction of a type appropriate to the circumstances. Such instruction shall provide the criteria for performing the work functions and shall be compatible with acceptance criteria for workmanship. The instructions are intended also to serve for supervising, inspecting, and managing work.

7.15 Records

The external provider shall establish and maintain procedures for identification, collection, indexing, filing, storage, maintenance, and disposition of quality records.

The external provider shall maintain and use any records or data essential to the effective operation of the quality program. These records shall be available for review by the Purchaser and copies of individual records shall be furnished at request.

a) Records are considered one of the principal forms of objective evidence of process completion and acceptance. The quality program shall assure that records are complete, reliable, retention times are established in writing and readily retrievable within 24 hours. When records are stored offsite retrieval time is considered 3 working days.
b) Inspection and testing records shall, as a minimum, indicate the nature of the observations together with the number of observations made and the number and type of deficiencies found.
c) Records for inspection and testing shall indicate the acceptability of work or products and the action taken in connection with deficiencies.

Records of processing, inspection, and test which are of crucial importance in substantiating conformance to the order shall be retained for the duration specified in the applicable purchase specification, or for a minimum of time listed in (section 8.0). When authorized by the purchaser, records may be submitted with the item/product to the purchaser for purchaser's retention.

7.16 Corrective Action

The external provider shall ensure the prompt detection and correction of assignable conditions adverse to quality. Corrective action shall include a minimum:

a) Analysis of data and examination of nonconforming or adverse conditions to determine extent and cause.
b) Analysis of trends in processes or performance of work to prevent the nonconformance.
c) Introduction of required improvements and corrections, an initial review of the adequacy of such measures, and monitoring of the effectiveness of corrective action taken.

When notified of a nonconformance relative to a material, product, or service, the external provider is required to investigate immediately and report within ten (10) working days to the purchaser the root cause(s) and planned corrective action, and commitment date for ultimate correction within thirty (30) days.

7.17 Document Control

The external provider shall ensure the adequacy, completeness, and the use of the latest revisions of drawings and specifications. Control of the effectivity of changes in design and/or contract revisions.

The external provider is responsible to ensure that documentation (drawings, specifications, and other) is available at locations where operations essential to the effective functioning of the quality system are performed and is of the correct revision status.

Government and general industry specifications are to be obtained from applicable sources. Composites Horizons LLC. will not supply these documents.

Specifications written by the purchaser and the end-user can be obtained directly through the purchaser.

Document Changes/modifications

Changes to documents shall be reviewed and approved by the same functions/organizations that performed the original review and approval unless specifically designated otherwise. The designated organizations shall have access to pertinent background information upon which to base their review and approval.

Where practical, the nature of the change shall be identified in the document or the appropriate attachments.

A master list or equivalent document control procedure shall be established to identify the current revision of documents in order to preclude the use of non-applicable documents.

Documents shall be revised to the next revision letter/number after a practical number of changes have been made.

7.18 Inspection And Testing

Receiving inspection and testing.

The external provider shall ensure that incoming product is not used or processed (except in the circumstances described below) until it has been inspected or otherwise verified as conforming to specified requirements. Verification shall be in accordance with the quality plan of documented procedures.

Where incoming product is released for urgent production purposes, it shall be positively identified and recorded in order to permit immediate recall and replacement in the event of nonconformance to specified requirements.

Note: In determining the amount and nature of receiving inspection, consideration should be given to the control exercised at source and documented evidence of quality conformance provided.

In-process inspection and testing.

The external provider shall:

a) Inspect, test, and identify product as required by the quality plan or documented procedures.
b) Establish product conformance to specified requirements by use of process monitoring and control methods.
c) Hold product until the required inspections and tests have been completed or necessary reports have been received and verified except when product is released under positive recall procedures. Release under positive recall procedures shall not preclude the activities outlined in (section 7.18) receiving inspection and testing.
d) Identify nonconforming product.

Final inspection and testing.

Note: External provider shall identify key/critical characteristics and include the inspection of the key/critical characteristics after subsequent processing to assure the product meets requirements.

The quality plan and/or documented procedures for final inspection and testing shall require that all specified inspection and tests, including those specified either on receipt of product or in process, have been carried out and that the results meet specified requirements.

The external provider shall carry out all final inspection and testing in accordance with the quality plan and/or documented procedures to complete the evidence of conformance of the finished product to the specified requirements.

No product shall be dispatched until all the activities specified in the quality plan and/or documented procedures have been satisfactorily completed and the associated data and documentation are available and authorized.

When certification is requested, the certificate shall include a statement of conformity declaring the end use customer (e.g., PWA End Use, GE Aviation End Use), and that the product has been tested and inspected (or processed) as specified and the results of these inspections and tests conform to the requirements.

Computer generated certificates require either (a) an actual or facsimile signature adjacent to a typed name, or (b) a letter accompanying the certificate. The letter must be signed by a responsible external provider quality representative, attesting that:

a) The external provider is using a computerized system.
b) The typed name on the certificate is an authorized external provider quality representative.
c) The external provider is responsible for the information contained herein.

Except as stated in (section 7.20), first article requirements will be specified in the purchase order.

7.19 Measuring and Test Equipment (M&TE)

The external provider shall provide and maintain gages and other measuring and testing devices necessary to assure that the purchased material or service conforms to technical requirements. The calibration of measuring and testing equipment and of measurement standards shall be in conformance with ISO 10012, ISO/IEC 17025, or ANSI/NCSL Z540.3.

When required, gages, measuring, and testing devices shall be made available for use by the purchaser, at the external providers facility, to determine conformance with contract requirements. If conditions warrant, external provider's personnel shall be made available for operation of such devices and shall verify the device's accuracy and condition.

ANSI/NCSL Z540 systems shall use the Handbook Z540.3 as the interpretive guide.

Reliability goals, accuracy ratios, and Significant-Out-Of-Tolerance condition criteria must be established:

a) The calibration interval analysis methodology used to maintain the reliability of M&TE, shall have a stated reliability goal to meet a minimum 95% reliability target for M&TE in–tolerance at the end of their interval schedule.
b) Significant–Out–Of–Tolerance conditions are defined as any M&TE out-of-tolerance condition exceeding 25% of the product tolerance. These conditions require documented review of impact on quality and notification to the purchaser if product received by purchaser has been affected.

Individuals performing visual dimensional inspection (i.e., calibration, in-process/final/ DSQR/ inspection,) shall be compliant to the near vision requirements of Snellen 14/18, (20/25) and Jaeger 2 at not less than 12 inches.

Individuals performing Non Destructive Testing (NDT) shall be compliant with the Aerospace Industries Association National Aerospace Standard (AIA/NAS) 410.

7.20 First Article Inspection

(When specified) the external provider's system shall provide a process for the inspection, verification, and documentation of a representative item from the first production run of a new part or following any subsequent change that invalidates the previous first article inspection results in alignment with AS9102.

7.21 Purchaser/Government Supplied Tooling and Material

When tooling (e.g., layup molds, inspection fixtures, assembly fixtures), or material (e.g., prepreg, consumables, adhesive tape, fiberglass) is furnished by the purchaser, the external provider's procedures shall establish requirements for initial and periodic assessment, adequate storage and protection, and maintenance of such equipment. Inspection, maintenance, and inventory records must be maintained.

The external provider shall use purchaser supplied products and tooling only in the manufacture and processing of purchaser's products, and only under the contract specified.

a) Products includes but is not limited to prepreg, fiberglass cloth, resin, and consumables.
b) Tooling includes but is not limited to layup molds, inspection/assembly fixtures, and production aids.

The external provider shall control purchaser supplied tooling and/or product as follows:

a) Upon receipt, inspect for identification, general condition, completeness, and proper quantity, type, or size. Perform functional testing of tooling, where necessary prior to production processing, to ensure proper operation.
b) After inspection of (section 7.21A), provide for identification and protection, periodic assessment, and controls necessary to ensure against loss, damage, or deterioration during handling, use, and storage.
c) Provide controlled movement, usage, and disposition to protect against unauthorized processing or merger with other materials.
d) Stop work and report unacceptable conditions immediately to the purchaser.

Unless otherwise addressed by purchase order or agreement, calibration of supplied tooling will be the responsibility of the purchaser.

The external provider shall:

a) Make arrangements through purchaser in advance of the calibration expiration date for the return of supplied tooling to purchaser for calibration and relabeling of calibration status.
b) If supplied tooling exhibits expired calibration status, arrange through purchaser for the recalibration of the item before further use.

7.22 Production Tooling Used As Media Of Inspection (MOI)

When external provider owned production fixtures, tooling masters, templates, patterns, and such other devices are used as Media Of Inspection, they shall be qualified by the external provider for accuracy prior to release for use. After qualification, these devices shall be proved periodically by the external provider for accuracy at intervals established

in a formal manner to cause their timely adjustment, replacement, or repair prior to becoming inaccurate.

Inspection devices described in (section 7.21) that are designed, built, modified, or purchased by the external provider must be under control. Devices supplied by the purchaser are exempt from the requirements of (section 7.21) and will be controlled under the purchaser's inspection system unless otherwise specified by purchase order or other agreement.

7.23 Control Of Purchases

Products, materials, and/or services procured from the external provider's subcontractors and external providers which are deemed critical to the performance of the contract, must conform to the purchaser's contract requirements. The external provider's responsibility for the control of purchases includes:

a) Inclusion of all applicable references from the purchaser's purchase order, blueprints, and specifications on instructions to the external provider's supply chain at all levels.
b) The evaluation of adequacy of procured items.

Effective provisions for early information feedback and correction of nonconformances.

Note: Raw materials for Government orders shall not be procured from foreign agencies or produced in non-domestic mills unless previously approved by CHI. Any "specialty metals" identified in DFARS Clause 252.225-7009 which have been melted outside of the United States, its possessions or Puerto Rico are prohibited. When approval is granted, an independent laboratory analysis by a CHI approved laboratory may be required.

Assessment of external provider.

The external provider shall select subcontractors on the basis of their ability to meet subcontract requirements, including quality requirements. The external provider shall establish and maintain records of "acceptable subcontractors" previously demonstrated capability and performance.

The external provider shall ensure that quality system controls are effective for their subcontracters.

Purchasing data.

Purchasing documents shall contain data clearly describing the product ordered, including, where applicable.

a) The type, class, grade, or other precise identification.

b) The title or other positive identification, and applicable issue of specifications, drawings, process requirements, inspection instructions and other relevant technical data, including requirements for approval or qualification of product, procedures, process equipment, and personnel.
c) The title, number, and issue of the quality system standard to be applied to the product.

The external provider shall review and approve purchasing documents for adequacy of specified requirements prior to release.

The external provider shall ensure that both the external provider and all levels of the external provider's supply chain's equipment, processes, operators, and inspectors are certified or qualified as required by specification and that such certification or qualification is documented accordingly.

It is the external provider's responsibility to obtain full compliance to the requirements from all levels of their supply chain.

The external provider shall ensure that raw materials to be used in fabrication or processing of products conform to the applicable physical, chemical, and other technical requirements. Laboratory testing shall be employed as necessary. When certifications are required, the actual quantitative test values shall be provided.

The external provider shall not subcontract work without express permission from both the purchasing and quality departments of the purchaser. Where subcontracting is permitted, the external provider shall use only those sources designated or authorized by the purchaser and the end-users.

When it is specified by the purchaser that an approved laboratory must be used for testing, the test laboratory used must be approved by the purchaser. This in no way reduces or eliminates the external provider's responsibility for testing performed by external provider's selected laboratory.

The external provider shall not under any circumstance accept for use a material or service which is in variation from the purchaser's contract without first obtaining express written approval from the purchaser.

Any purchased material or service applicable to a controlled process of (section 7.24) shall be considered critical, and all requirements of (section 7.22) shall apply.

7.24 Process Control

The external provider shall ensure that all machining, heat treating, surface treatment, etc., and all basic production operations of any type, together with all processes and fabrication of any type, shall be accomplished under managed conditions.

Managed conditions include documented work instruction, adequate production equipment, any special working environment, and qualification or certification as may be applicable.

Inspection and monitoring of processed materials or services shall be accomplished in any suitable manner prescribed by the external provider, unless otherwise specified by the purchase order.

7.25 Handling, Storage And Delivery

The external provider shall provide adequate work and inspection instructions for handling, storage, preservation, packaging, and shipping to protect the quality of materials and prevent damage, loss, deterioration, degradation, or substitution.

The external provider shall include an inventory management system or method to assure stock rotation (e.g., FIFO – first in first out), shelf life control, inventory accuracy, and segregation of unserviceable product, equipment, tools, and material.

7.26 Nonconforming Material

The external provider shall establish and maintain an effective system for controlling nonconforming material, including procedures for its positive identification, segregation, and disposition.

The following requirements are applied:

a) The external provider shall not rework, repair, substitute or subject material to operations or processes which are not otherwise authorized in the contract. Nonconformances of this nature shall be promptly referred in writing to the purchaser for the purchaser's disposition.
b) Nonconforming materials are not to be delivered without the express written approval of the purchaser regardless of any previous conditional acceptance.
c) On items previously delivered, the external provider is required to notify the purchaser within twenty–four (24) hours of the detection of any nonconformance which exists or may exist. Escape information shall be recorded onto the Notification of Product Quality Escape (or equivalent) of AS9131 and promptly communicated to purchaser.

7.27 Indication Of Inspection Status

The external provider shall maintain a positive system for identifying the stage of processing (inspection status) of material. Identification may be accomplished by means of stamps, tags, routing cards, move tickets, tote box cards or other control devices.

If inspection stamps are used, they should be of design which cannot be mistaken for a Government stamp.

7.28 Source Inspection

The external provider's system must provide for the following when Government Source Inspection is required by purchase order:

a) Prompt notification to the Government Representative upon receipt of the order.
b) Prompt purveyance of copies of the purchase order to the Government Representative upon receipt of the order.
c) Availability at site of all documents and reference data for review by the Government Representative.
d) Purveyance of copies of purchasing documents as instructed by the Government Representative.

When source inspection at external provider facilities is required, the purchase order will so state. The government and the purchaser reserve the right to inspect at the external provider facilities. Source inspection shall not constitute acceptance; nor shall it replace the external provider's inspection or otherwise relieve the external provider of responsibility to furnish acceptable material or service. Source inspection is not to be used as evidence of effective inspection.

7.29 Product Identification and Traceability

Where appropriate, the external provider shall establish and maintain documented procedures for identifying the product from receipt and during all stages of production, and delivery.

Where, and to the extent that, traceability is a specified requirement, individual product or lot/batch shall have a unique identification. This identification shall be recorded.

Composites Horizons LLC. requires lot/batch control and/or serialization traceability be maintained at all times.

7.30 Additional Quality Assurance Requirements

Software Quality Assurance

When a controlled product, material, or service is specified by purchase order or other agreement, a system must be developed and implemented by the external provider to assure that software meets the contractual requirements. The system will consist of methods, documentation and control of systems analysis, design, software development, acquisition, use cataloging, storage, revision, audit, and testing.

The external provider shall establish and implement a Software Quality Assurance Plan (SQAP) to ensure that deliverable software, and non–deliverable software used directly for the design, processing, inspection, test, or operation of deliverable materials is controlled. The SQAP must detail the methods to be used and the responsibilities and identification of personnel and/or positions involved with specific software systems.

For deliverable software and software contained in deliverable materials, all elements of AS9115 must be addressed and appropriately tailored in the SQAP.

a) The external provider may be required to submit the SQAP to the purchaser's quality department via purchasing, prior to contract award, for review and approval.

For non–deliverable software such as CAD, CAM, CAI, and ATS, all elements of ARP9005 must be addressed in the SQAP, including but not limited to:

a) Software Development – A system for the development, acceptance, and implementation of software must be established. The system must include test procedures, authorizations required, and method of software acceptance.
b) Software Test Criteria – Responsibility for delineating the criteria for demonstrating that software is adequate for its intended use must be established.
c) Documentation – Program requirements shall be thoroughly documented to provide the basis for subsequent software maintenance. Test criteria used and required approvals by external provider's quality department shall be documented.
d) Library Controls – External providers shall ensure that different software versions are identified that no unauthorized modifications are made, that all approved modifications are properly incorporated, and that software in use is the correct approved version.
e) Subcontractor Control – External providers shall ensure the requirements of this section (section 7.22) are flowed down to their sub–tier external providers. External providers shall identify the approval authority for sub–tier external provider SQAPs.

For external providers using non–deliverable software, the SQAP shall be subject to review and approval by the purchaser.

7.31 Statistical Quality Control

When specified by purchase order or other agreement, a program for statistical quality control shall be developed and implemented by the external provider. Statistical methods, planning, analysis, tests, and quality control procedures may be used whenever such procedures are suitable to maintain the required control of quality. The purchaser reserves the right to review such procedures and approve or disapprove where reasonable concern for the assurance of quality is given.

Sampling inspection procedures proposed by the external provider to determine quality conformance of materials shall comply with the requirements of the purchase order and shall be subject to the purchaser's approval.

Statistical quality control should be demonstrated by analysis of objective quality evidence prior to proposed new or reduced sampling inspection procedures except where:

a) Final inspection is performed by destructive testing.
b) Inherent characteristics of the product indicate that sampling inspection will not jeopardize the quality.
c) Subsequent inspection at a later operation will provide the necessary quality assurance.

Statistical process controls that are not used to determine quality conformance of materials or services may be used at the external provider's discretion.

7.32 Quality Costs

When specified by purchase order or other agreement, the external provider shall maintain and use quality cost data as a management element of the quality program.

The external provider's Quality Cost program shall include identification, documentation, and analysis of the costs of prevention, appraisal, correction, and failure.

At the request of the purchaser, the external provider may be required to demonstrate the effective use of this data as a management tool.

7.33 External Provider Qualification

External provider evaluation:

The purpose of the external provider quality evaluation is to verify that the external provider has the systems and procedures necessary to assure compliance to this document and other contractual requirements. Arrangements for a system appraisal will normally be made through the purchase agent. During the appraisal, the purchaser's quality representative, with assistance from the external provider, shall complete the specific items of the Supplier Quality Survey Form.

The appraisal can include a tour of the external provider's facilities to determine if the organization, procedures, and techniques are in effect. Appraisal criteria will include, but not be limited to the following:

External Provider Qualification:

a) Quality system certifications.
b) Calibration system and adequacy of calibration procedures.
c) The adequacy of the operation, methods, and facilities as they effect quality workmanship (e.g., plant layout, hand tools, personnel, fixtures, equipment, etc.).
d) A comparison of the workmanship standards of the external provider to that of the purchaser's requirements.

Where deficiencies are noted, the external provider will be required within fifteen (15) working days to initiate statements of cause, corrective action, and effectivity. Approval will be granted, extended, or denied, based upon the acceptability of the statements. The purchaser reserves the right to verify, by survey or other means, that corrective action is effective.

7.34 Continuing Approval

The external provider's approval status shall remain in effect provided all of the following apply:

a) The external provider performs work for the purchaser on a routine basis.
b) The external provider quality rating and on time delivery is satisfactory.
c) Quality surveys are satisfactory.
d) The external provider performs within the limits of the approval.

The external provider approval status may be withdrawn whenever any one of the following apply:

a) The external provider does not perform work for the purchaser for a period of twelve (12) consecutive months.
b) External provider or Quality Survey results are unsatisfactory.
c) The external provider violates (without prior approval) the limits of the approval certificate.
d) The external provider fails to take prompt corrective action when requested by the purchaser.

An external provider who is withdrawn from continued approval will be so notified by the purchaser. The notification will specify the reason for withdrawal and may include recommended action necessary to regain the approval status.

7.35 Controlled Processes

When a product, material, or service is designated by purchase order or other agreement as being subject to controlled process, the external provider shall be required to:

a) Submit work instructions and applicable procedures to the purchaser for approval.

b) In the event of proprietary elements, demonstrate to the purchaser a program of configuration management and subsequent assignment of revisions to the process.
c) Submit to the purchaser for approval any proposed change to the process or materials, or to any change at any level of their supply chain.

The external provider shall submit the controlled process package to the attention of the purchase agent at the earliest opportunity after order acceptance.

Upon establishment of an approved controlled process, the external provider shall not modify, substitute, or otherwise change the process without the written approval of the purchaser. This includes, but is not limited to:

a) Materials.
b) Equipment (including location).
c) Process elements.

The purchaser reserves the privilege to submit controlled process packages to its end–user customer for approval.

When requested by the purchaser, the external provider shall supply samples and data for correlation of their inspection techniques with those of the purchaser.

7.36 Equipment/Machine Servicing

CNC Machines, Autoclaves, Ovens, Presses.

- The provider's calibration system must be accredited to AS9100, ISO9000, ISO17025, ISO10012-1 and satisfies the requirements of 10CFR part 21, 10CFR, Appx. B, Part 50, ANSI Z540-3.
- Servicing of equipment/machine shall be in accordance with ISO/IEC Guide gg 3:200g (GUM) as applicable.
- Measurement standards used to calibrate the equipment/machine listed on the certificate must be compliant to ISO/IEC 170252:2017 and ANSI/NCSL Z540.1 - 1994 (R2002).
- Servicing/calibration record shall be traceable to the national standards administrated by the U. S. National Institute of Standards and Technology (NIST).
- When not specifically called out in measurement report, a minimum Test Uncertainty Ratio (TUR) of 4:1 can be assumed, generally 10:1 in most cases.
- The reported results must relate only to the items calibrated and the certification shall not be reproduced, except in full, without the written approval from the metrology company performing the service.
- CHI may request supporting documentation related to the traceability at any time.

7.37 GE-A End User

Fabrication or processing of component parts or assemblies or services for delivery to General Electric Aviation are processed to the latest revisions of the S-1000 and associated specifications as they apply to the specific product or service.

Document Number	Title
S1000	GE Aviation Quality System Requirements For Suppliers
S-1001	Supplier Source Substantiation
S-1002	GE-A Supplier Requirements For Characteristic Accountability, Verification, And Quality Planning
GE Yellow Pages	Approved Supplier List
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations

All special processing, (e.g., chemical surface treatment, Heat Treating, Welding, NDT) shall be performed only by suppliers listed in the current GE Aviation Approved Source List for Special Processes.

7.38 Pratt & Whitney End User

Fabrication or processing of component parts or assemblies or services for delivery to Prat Whitney are processed to the latest revision of the ASQR-01 and associated specifications as they apply to the specific product or service.

Document Number	Title
ASQR-01	Supplier Quality System Requirements
ASQR-07.5	Control of Software
ASQR-09.2	UTC Production Part Approval Process (PPAP)
ASQR-15.1	Foreign Object Damage/Debris Prevention, Handling, Storage, Packaging, Preservation and Delivery
ASQR-20.1	Supplier Sampling Requirements
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations

All special processing and testing shall be performed only by suppliers listed in the latest revision of Pratt Whitney Materials Control Laboratory Manual App. 36 and App 56.

7.39 Rolls Royce End User

Fabrication or processing of component parts or assemblies or services for delivery to Rolls Royce are processed to the latest revision of the SABRe and associated specifications as they apply to the specific product or service.

Document Number	Title
SABRe	Supplier Quality System Requirements
RRES 90000	Engineering Control of Production Source and Method
AS9145	Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP)
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations

Only purchase products and services from sources holding Rolls-Royce and/or Third Party approval appropriate to their type and level of supply as stipulated in SABRe (latest edition) paragraph 4.3, Table 1 and 2.

7.40 Honeywell End User

Fabrication or processing of component parts or assemblies or services for delivery to Honeywell are processed to the latest revision of the SPOC Manual and associated specifications as they apply to the specific product or service.

Document Number	Title
SPOC Manual	Supplemental Purchase Order Conditions Manual
SPOC 108	Eye Examinations
SPOC 110	Fixed Process Requirements
SPOC 124	First Article Inspection
SPOC 140	Certificate of Conformance/Shipping Declaration/Packing Slip Requirements
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations

External providers shall ensure that all controlled processes are performed by sources approved for the applicable process family and code listed on the Honeywell Approved Processing Source List (APSL) available at https://scc.honeywell.com/irj/portal HASP/Applications.

8.0 RECORDS

Record retention for engine manufacturing providers:

Retention Time Period (From Date Of Manufacture)	Part Type
40 years	Critical Safety Item(s).
10 years	All other serialized parts.
10 years	All other non-serialized parts.
AS13100, 7.5.3.5.1: Documented information (Design Records) shall be retained for End of Life of Product Operation plus (+) 10 Years, if not otherwise required by the customer. ***Note: End of Life of Product Operation meaning notification by the customer of withdrawal of type certificate for civil aerospace applications or notification of the withdrawal for support in the case of military aerospace products. Documented information (Design Records) typically include the contents of the Design Technical Data Package (DTDP) (8.3.5.3) as well as any records of design support to nonconformance approval, e.g., analysis, calculations.***	

9.0 IMPORTANT NOTES

As listed within this document.

10.0 REFERENCED DOCUMENTS

Document No.	Document Title
ISO 10012	Measurement Management Systems – Requirement for Measuring Processes and Measuring Equipment
ISO/IEC 17025	General Requirements for the Competence of Testing and Calibration Laboratories
ISO 9001	Quality Management Systems – Requirements
ARP 9005	Aerospace Guidelines for Non–Deliverable Software
AS6174	Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel
AS9100	Quality Management Systems – Aerospace Requirements
AS9115	Deliverable Software Supplement for AS 9100
AS9131	Quality Systems – Nonconformance Documentation
AS9145	Requirements for Advanced Product Quality Planning and Production Part Approval Process
AS9146	Foreign Object Damage (FOD) Program Prevention
AS13004	Process Failure Mode and Effects Analysis (PFMEA) and Control Plans
AS13006	Process Control Methods
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations
S–1000	GE Aviation Quality System Requirements For Suppliers (GE End–Use)
ASQR-01	Supplier Quality System Requirements (Pratt Whitney End–Use)
SABRe	Rolls Royce Supplier Management System Requirements
SPOC Manual	Honeywell Aerospace Supplemental Purchase Order Conditions Manual

11.0 APPENDICES

None

Date	Revision	Description of Change	Approval
01/11/2019	NC	Incorporated prior CHQAR's	P. Giffin
12/09/2022	A	Added servicing, updated titles under approver.	T. Hynes
03/31/2023	B	Revised format, complete rewrite adding the AS13100 requirements flow down.	C. Clinton

APPROVALS

Vice President, Engineering: _____ Date: 4-3-2023

Vice President, Quality Assurance: _____ FOR C. CLINTON Date: 4-3-2023

Vice President, Operations: _____ Date: 3-31-2023