1. Purpose

This document defines the Supplier Quality Requirements for Sensors and Integrated Systems (SIS)

2. Scope

This document is applicable to all SIS Sites.

Notice

3.0 Introduction

United Technologies Aerospace Systems, Sensors and Integrated Systems (SIS) is dedicated to continuous improvement in the quality and integrity of its products and services and to the satisfaction of its customer requirements and expectations. Supplier contribution to this approach through the quality and reliability of their products and services is a prerequisite. The SIS reputation is built on a foundation of integrity and ethical principles. Our success depends upon maintaining a commitment to integrity, fairness and quality of service. As suppliers to SIS, these attributes must be core competencies within your company.

The purpose of this document is to provide the minimum quality system requirements to suppliers of direct materials and services to SIS. Suppliers of direct materials and services must initially meet this requirement and maintain a Quality Management System that supports the requirements outlined herein.

MSD 601 supplements the requirements of ASQR-01 and UTAS-SCM-PRO-0003. All requirements of the 3 documents are required as part of compliance to MSD-601. These requirements are in addition to any purchase order requirements that are in effect and do not replace them.

The document also provides minimum requirements for suppliers of products or services that may impact SIS product, such as Maintenance, Repair, and Overhaul (MRO), Calibration, Deliverable Software/Firmware, and Test Services suppliers. These requirements are provided in Appendix R.

4.0 Definitions

Aerovantix: Corporate Supplier Portal that is used to collect, manage, and communicate supply chain information. Located at http://www.aerovantix.com

Certificate of Compliance: A legal document provided by the supplier that includes the requirements of the certificate of conformance, and specifically cites and certifies that all military, industry, material, and special process specifications referenced on the drawing have been met.

Certificate of Conformance: A legal document provided by the supplier that states their compliance to all applicable drawing, specification, and purchase order requirements.

C-Drawings: SIS drawings for off-the-shelf component items. However, in some instances features are added or customized beyond the current off-the-shelf configuration.

Deliverable Software: All software, including software embedded in deliverable hardware and deliverable firmware.

Deviation: A specific written authorization granted prior to the manufacture of an item to depart from a particular requirement (s) of an item's currently approved configuration documentation for a specific number of units or a specified period of time.

Direct Material: Material that goes into and forms a permanent part of the end product. Services that may affect the form, fit or function of these materials is included in this definition.

First Production Article: The first items of a production run that are the result of a planned process designed to be used for future production of these same items. Prototype parts, or parts built using methods different from that intended for the normal production process, shall not be considered as first article production parts.

Fixed/Frozen Process: A manufacturing process that has been identified by SIS or SIS customers that shall not be changed without prior SIS approval. These include process operating parameters, sequence of operation, material or sources**.**

Non-Conforming Product: Any material or product that does not meet the associated engineering drawing or specification or was not processed in accordance with the proper specification or procedure.

Non-Deliverable Software: Software used in the design, manufacture, inspection, test acceptance, or calibration that has a direct effect on a deliverable product. Examples include but not limited to:

- Computer Numerical Control (CNC)
- Gage Calibration
- Coordinate Measurement Machine (CMM)
- Programmable Logic Control (PLC)
- Performance Acceptance Test

- Burn-in

Product Acceptance Records: Official records to be maintained by the supplier indicating a product passing through planned operations and satisfying planned requirements during product realization (e.g. signed routers, completed ATP data sheets)

Quality Management System (QMS): The collection of documents and procedures and standard practices that are used to define and effectively implement the organizations quality goals.

Raw Material: Unfinished constituents of a finished product, material that requires further processing to become the finished product.

Root Cause Corrective Action (RCCA): Action taken to eliminate or reduce the cause of an existing non-conformity, defect, or other undesirable condition at the most fundamental level.

Special Process: A process which may alter the chemical or physical properties of the item. The impact of such a process cannot typically be evaluated without destructive testing, such as;

- Chemical Processing (CP)
- Coatings (CT)
- Welding/Brazing (WLD)
- Non-Destructive Test (NDT)
- Heat Treatment (HT)
- Composites (COMP)
- Surface Enhancements (NMSE)
- Materials Testing Lab (MTL)
- Electronics (ETG)
- Non-conventional Machining (NM)
- Sealants (SLT)

Standard Part: A part manufactured in complete compliance with an established U.S. Government or industry accepted specification which includes design, manufacturing, and uniform identification requirements. The specification must include all necessary information to produce the part.

Waiver: A written authorization to accept an item, which during manufacture or after having been submitted for acceptance is found to depart from specified requirements but is suitable for use as is or after a repair.

5. Supplier Requirements

5.1 General Requirements

SRI Process

Supplier Requests for Information (SRI) can be made through the responsible SIS buyer. ASQR-01 form 3 is the preferred tool for SRI requests.

Special Processes

All suppliers (regardless of tier) shall use only SIS-approved special process sources unless otherwise permitted by contract. A supplier may request that a source be added to the SIS-approved special process listing through the SRI process. However, such sources may not be used prior to being listed. A listing of SIS-approved Special Process Suppliers can be found on Aerovantix.

For all special processing that requires Nadcap accreditation, the supplier shall provide a certificate of conformance verifying each special process or NDT method was performed by a Nadcap-accredited source with each shipment. Certification shall provide evidence of compliance to drawing, specification and/or purchase order and contract requirements in accordance with Appendix H of this document.

5.2 Configuration Control Requirements

The supplier shall meet the requirements of the SIS purchase order completely. If any second tier subcontract is required, the sub-tier may not then further subcontract the purchase order.

Written consent from SIS shall be obtained prior to making any changes to the functional, physical or operational interchangeability, weight, safety, reliability, service life and maintainability of product prior to any deliveries. SIS reserves the right to reject and/or retain any delivered items against the Purchase Order until concurrence of the supplier's submitted change request is approved. Additional guidance can be found in ISO-10007.

5.3 Control of Documents

"White-out" or correction fluid shall not be used on product acceptance records. Corrections can be made by marking the error with a single line then having the authorized person make and initial the correction.

5.4 Records

Product acceptance records shall be maintained for a minimum of 10 years unless otherwise specified by contract. Records shall be sent to SIS within 48 hours of requesting them.

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5.6 Human Resource Requirements

Job descriptions shall be prepared identifying the qualifications required for each position that affects product quality.

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5.11 Purchasing Information

The purchasing documents shall be reviewed to ensure the adequacy of requirements before orders are placed with the sub-tier supplier. Purchase orders placed with sub-tier suppliers to fulfill SIS orders must cascade pertinent requirements including Quality Management System and customer specific requirements to sub-tier suppliers. If a government contract is being fulfilled, federal acquisition regulations (FAR) and defense federal acquisition regulations (DFAR) supplemental requirements shall be invoked on sub-tier purchase orders. Additional quality clauses may be incorporated on the SIS purchase orders and those clauses shall be subsequently flowed down to sub-tiers where appropriate.

Proprietary information shall not cascade to second tier suppliers without written permission from SIS.

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5.14 Identification and Traceability

The supplier shall identify the product throughout product realization. The supplier shall control and record the unique identification of the product. The traceability system must facilitate the rapid identification and notification of any part delivered and suspected of being defective.

5.15 Customer Property

All suppliers in possession of SIS-owned property shall have a documented process for controlling customer property. SIS or SIS customer property shall be used only as required in the completion of SIS orders.

5.16 Preservation of Product

5.16.1 Deleted

5.16.2 Material Storage and Environmental Control

When age controlled material is involved, the supplier shall identify each material container with the month, day, and year manufactured, and the time period before expiration (applies to delivered product). Test reports and/or certifications shall include the expiration date in a month, day, and year format. SIS reserves the right to reject and/or return any material with less than seventy-five percent (75%) shelf life remaining unless covered by other UTC documentation.

> Note: Material covered under vendor managed inventory may be excluded from this requirement.

When temperature controlled material is involved the supplier shall provide material packaging suitable to maintain proper temperature during transportation from their facility to SIS. Supplier shall provide necessary temperature measuring equipment to monitor the material during transportation to assure compliance to the specifications of the Purchase Order/Contract. Packaging for such material shall be clearly marked as containing temperature controlled material. SIS reserves the right to reject or return any material where temperature storage requirements have been exceeded.

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The following appendices apply to all suppliers unless specifically excluded by purchase order or other agreement.

Appendix A: Fixed Processes

During the SIS Critical Design Review or during a subsequent Quality review, Fixed Processes may be established for some products. Fixed processes shall be identified as such on the supplier's manufacturing router or shop traveler. These processes shall not be changed without SIS approval. Changes refer to process parameters, equipment, tooling or plant layout as well as a change of sub-tier supplier.

Requests for fixed process change approval shall be submitted to the SIS buyer.

The supplier shall also flow this requirement to applicable sub-tiers.

All changes to fixed processes will require new first article inspection report in accordance with AS9102 and this document.

Appendix B: Deleted

Appendix C: First Article Inspection Requirement

Form 1, Field 18, "FAI Report Number", is a REQUIRED field. The FAI Report Number shall be given for all component parts listed that are required to have a First Article Inspection per section 4 of the Standard. If the component part is a Standard Catalog Hardware then "n/a" shall be entered.

A first article inspection report is required to be submitted for each drawing revision change (without regard to form, fit, or function). If the revision is only an administrative correction, the FAI shall state that.

First article inspections to SIS require certification of compliance or material certification traceable to the original manufacturer. This applies to delta FAI when material is affected.

Note - AS9102 FAI forms are available at www.sae.org/aaqg/publications/as9102a-faq.htm.

Note – For SIS drawings used to procure supplier Off-The-Shelf (OTS) products (C-drawings), a FAI is only required for the specific characteristics controlled by the SIS drawing (e.g., painting an OTS screw would require an FAI on the paint only).

Note – FAI training material is available at http://utcaerospacesystems.com/Company/suppliersdocuments/Sensors%20and%20Integrated%20Systems/Quality/FAI%20Training%20Tool.pdf

Appendix D: Non-Conforming Product / Deviations and Waivers

Suppliers shall take the following steps when nonconforming material is found:

1. Identify the nonconforming material and segregate it in a bonded area.

2. Submit a SIS Request for Deviation/Waiver detailing the discrepancy, quantity discrepant, the cause and corrective action to eliminate the discrepancy and the effectivity point of the correction. Deviation/Waiver request forms are available at:

   http://utcaerospacesystems.com/Company/Pages/documents.aspx

Repair procedures must be approved by SIS in advance of their use on SIS product. Approval of the repair procedure does not imply final acceptance of the product.

Known defective parts/material is not to be sent to SIS without an approved Deviation/Waiver. This approved document shall be shipped with parts.

Appendix E: Root Cause Corrective Action

A standard SCAR tool (SISF00040) and form (SISF00225) are available on Aerovantix for all required SCAR responses. The supplier may also utilize their own form if it addresses all information contained on the UTAS SIS forms.

Appendix F: Supplier Nonconformance Charge Back Program

Suppliers are responsible for administrative costs incurred by SIS associated with the review and disposition of supplier-manufactured nonconforming product. Once a supplier nonconformance has been confirmed, the SCAR process described in Appendix E may be initiated and the following charges may be withheld for payment:

- A debit of $2,500 USD for each validated supplier-caused nonconformance identified at the time of receipt. This debit may also be imposed for any missing or incorrect documentation received (or omitted) with the products that prevents the material from being received or available for use.
- A debit of $2,500 USD for each validated supplier-caused nonconformance identified at the point of use within the manufacturing processes across SIS
- A debit of $2,500 USD for validated supplier-caused nonconformance identified in conjunction with returned products and failure analysis from SIS customers
- Validated repeat defects may incur an additional $2,500 USD per repeat occurrence

Note 1 - All products associated with the lot found to be nonconforming will be counted as a single nonconformance for the purposes of the charge back process.

Appendix G: Scorecards

In order to keep suppliers apprised of their level of performance in the delivery of goods and services to SIS, scorecard data will be compiled and used as a metric. There are metrics for both on-time delivery and quality. Scorecard data will be sent to suppliers. Suppliers are responsible for keeping contact information up to date.

The delivery metric is the percent of lots delivered "On Time Delivery" OTD. OTD is measured from the receipt to SIS dock vs. the purchase order due date. A tolerance window of zero calendar days late to three calendar days early has been established. The goal is 100% OTD.

The standard quality metric for all suppliers is the quantity of parts nonconforming divided by the quantity of parts received. The goal is zero defects for all delivered products.

Suppliers are expected to work with SIS personnel to continuously find process and cycle time improvements as well as cost reductions.

Suppliers shall maintain an acceptable SIS performance rating. Failure to meet the SIS performance rating requirements may result in supplier disapproval.

Scorecards for Key Suppliers

Additional UTC Supplier Gold scoring criteria are applied to suppliers identified by SIS as key suppliers. These criteria are established as a means to facilitate our key suppliers' ability to achieve stated objectives and include the following:

- Supplier Health Assessment (SHA)
- Market Feedback Analysis (MFA)

Your buyer or supply chain quality representative can provide your status as a key supplier and provide the detailed criteria.

Scorecards for the key SIS suppliers can be provided by your buyer or supply chain supplier quality representative.

Appendix H: Certificates of Conformance/ Compliance

In addition to requirements specified in UTAS-SCM-PRO-0003, C of Cs shall include Government contract number where applicable. Certifications from a sub-tier to the supplier shall provide traceability to the manufacturer and manufacturing lot.

Requirements for the citation of specific drawing callouts or submission of ATP or test results may be specified on the drawing or purchase order.

Suppliers performing special processes shall list the number and revision level of the applicable process specification (s), lot size, lot number or heat number, sample size, applicable process specifications/controls and applicable test results. If the job was processed using a Nadcap accredited process, the supplier shall include a statement indicating the job was processed per their Nadcap accreditation and shall include their accreditation number and expiration date.

For raw components purchased from circuit card assembly suppliers: The supplier shall provide a Certificate of Conformance, and if required, the original component manufacturer's Certification.

Material purchased from SIS, and then subsequently repurchased, shall show traceability via the original PO to SIS used to acquire the material.

Certificate of conformance documentation requirements from distributors can be met in one of the following ways:

1) Original manufacturer's certifications shipped with material or parts plus the distributor's certification.
2) Distributor's certification referencing OEM documentation that is maintained on file. Distributors in this category are designated as "Qualified Distributors" and must be licensed by the manufacturer to distribute product or registered to ISO-9001, AS-9100, or AS-9120. Additional SIS requirements may also apply.
3) For distributors of raw material, documentation with shipments must include physical and chemical properties reports traceable to heat code or lot number.

Appendix I: Communication and Responsibilities

In addition to the notification requirements specified by ASQR-01 and UTAS-SCM-PRO-003, the supplier shall notify SIS of any changes of suppliers.

When SIS source inspection is required at the suppliers facility it shall be after supplier inspection and prior to packaging and shipment. In-process inspection or witness of ATP when required by purchase order need not be performed prior to customer inspection. Supplier shall supply the purchase order or contract including amendments, drawings, specifications, and applicable records, certifications and all necessary measuring equipment. Evidence of source inspection must be indicated on the inspection or ATP record and the shipping paperwork.

The SIS buyer must be notified at least forty-eight hours (48) in advance of the time product is to be inspected. SIS reserves the right to waive source inspection.

When a purchase order specifies "**Government Source Inspection required**," the supplier shall immediately furnish a copy of the purchase order to the government representative who has delegation for the suppliers' facility. If the supplier does not have such a representative, the supplier shall notify the government inspection service fourteen (14) days in advance, when possible, of the time when such inspection will be required.

In the event that an item becomes obsolete, SIS requires 12 months prior notification of such and reserves the right to make a 'last buy' to insure uninterrupted delivery to the end customer.

Appendix J: Export / Import Compliance

The supplier, and their sub-tier suppliers as applicable, shall comply with all export-import control laws and regulations including, but not limited to, the U.S. Export Administration Regulations (EAR) and the U.S. International Traffic in Arms Regulations (ITAR) to the extent applicable to the supplier and SIS respective activities under the Purchase Order.

Any supplier who manufactures defense articles or furnishes defense services for SIS is required to register with the U.S. Directorate of Defense Controls per ITAR Part 122.

> Follow the link below to register.
>
> http://www.pmddtc.state.gov/registration/index.html
>
> Follow the link below for ITAR Part 122.
>
> http://www.pmddtc.state.gov/regulations_laws/itar.html

If the data or product provided under the SIS Purchase Order is controlled for US export-import reasons, such data/product will not be further disclosed, exported or transferred in any manner to any other foreign national person (internal or external to the supplier or sub-tier suppliers) or any foreign country contrary to U.S. export-import law.

Prior to a supplier sub-contracting to a foreign facility for product under SIS design control, they must obtain approval from the SIS International Trade Compliance Group. Supplier is also responsible for obtaining any required export authorizations necessary to allow a foreign facility to product the product under SIS design control. Supplier is required to provide SIS with a certification that such authorization has been obtained, including the number of the authorization. If a supplier has any questions on export jurisdiction for SIS designed product, contact SIS.

When supplying product to SIS that is under supplier design control, the supplier shall provide the export classification jurisdiction (e.g., Export Classification Control Number (ECCN), ITAR USML classification), Harmonized Tariff Schedule (HTS) Code, and the Country of Origin information for that product (e.g., on the shipping documentation).

The supplier is required to notify SIS of part or component status changes in regards to facility, address, and country of origin, export control classification jurisdiction and HTS code. The supplier may use SIS Form SISF00127 or a form with the required information from their own document system. The form must be signed by an authorized supplier representative.

Appendix K: Deleted

Appendix L: SIS Supplied Software/Firmware

Suppliers that load SIS provided software and/or firmware are required to verify and control the software using SIS Form SISF00126 or equivalent. The supplier shall have documented procedures that provide for the application of manufacturing controls and quality assurance procedures for verifying, loading, and controlling the software/firmware.

When suppliers utilize a third party to load software and/or firmware, they shall flow down these applicable requirements and ensure the applicable agreements are in place with those sub-tier suppliers to protect SIS proprietary information.

Appendix M: Direct Ship Authority

A supplier may be granted direct shipment authority allowing them to ship directly to SIS customers. This approval will be granted by a specific SIS business unit and location and would only be valid for that location. Special instructions for direct ship will be contained in the purchase order.

Appendix N: Right of Entry

SIS, its customers, the FAA or other government agencies reserve the right of entry to survey the suppliers' quality management system, processes, sub-tiers and to review all applicable records or that of the supplier's sub-tier suppliers.

Appendix O: Key Supplier Certification Process (Dock to Stock Requirements)

Suppliers are expected to achieve a Certified Supplier status and become eligible for dock to stock shipments. Suppliers are classified in the following categories:

- Certified – A supplier that has demonstrated sufficient levels of process capability, such that the requirement for SIS inspection can be completely removed. By maintaining the required quality performance and successfully completing a process audit, suppliers are eligible to ship parts under the dock to stock program.
- Designated – A supplier that participates in the Designated Supplier Quality Representative (DSQR) program. Incoming inspection requirements are removed from SIS and replaced by source inspection performed by a designated supplier quality representative.
- Approved – Initial status assigned to a production supplier. Incoming inspection will be required at SIS until such time that quality performance results are consistently being met
- Directed Inspection - In the event a supplier fails to meet quality performance expectations, SIS may elect to employ a 3rd party source inspector to oversee the processing and release of product to SIS. Any costs associated with the implementation of directed inspection would be the responsibility of the supplier.

Appendix P: Deleted

Appendix Q: Counterfeit Parts Prevention

Suppliers providing electronic assemblies, components, or containing electronic components to SIS shall be compliant to this section. Further guidance can be found in SAE AS5553.

Procurement Precedence

1. **Electronic parts shall be purchased directly from the OEM or their Franchised Distributors whenever available.** Product lead-time and cost shall not preclude adherence to this provision.
   - Parts from the OEM or their Franchised Distributors shall have:
     - Original manufacturer warranty
     - Acquisition traceability to the OEM via proper packaging, handling, storage, and shipping.
     - OEM Certificates of Conformance per Appendix H.
2. Electronic parts that are out of production and not available per section 1 may be procured through a Broker with prior SIS Value Stream approval and providing component authenticity has been establish per this section.
   - Certificates of Conformance and acquisition traceability (CoCT) shall be provided.
   - Reasonable effort shall be made to verify authenticity of the documentation by the purchasing company.
   - Brokers shall have an active counterfeit part detection program. SIS Supply Chain Management shall review relevant databases (ERAI, GIDEP) to evaluate broker's history of supplying counterfeit components prior to approval.
   - Inspection protocols F, A, B of Testing/Analysis Table shall be performed.
   - Suppliers should notify the appropriate Value Stream buyer to request Design activity for component replacement or circuit card re-design per local Value Stream procedure.
3. Electronic parts not available per section 1 or 2 may be procured from a Broker without CoCT only after SIS Value Stream approval and component authenticity verification per Component Verification section and Testing/Analysis Table.
   - Broker shall have an active counterfeit part detection program. SCM shall review relevant databases (ERAI, GIDEP) to evaluate broker's history of supplying counterfeit components prior to approval.
   - Suppliers shall notify the appropriate Value Stream buyer to request Design activity for component replacement or circuit card re-design.

Component Verification

All inspection and testing shall be performed to the original manufacturer's specifications and parameters. Steps A, B, C, D, E, and F should be performed in order. If a nonconformance is found, stop testing, reject the lot, and notify the Value Stream buyer. Testing shall only be performed by test houses pre-approved by the cognizant SIS Supplier Quality Engineer.

A: Visual Inspection

Each lot to be delivered shall be subjected to a visual inspection at an AQL of 1.0 or tighter with 40x minimum magnification. 100% of the remaining lot shall be visually inspected without magnification. Visual inspection shall include but is not limited to: verifying lot/date codes against manufacturers database, correct English spelling, manufacturer's logo, evidence of component remarking, damage, bent leads, chip-outs, scratches, cracks, terminal finish inconsistent with manufacturer's specification for that part number, any discrepancies to the pin one indicating area, and inconsistencies between the upper and lower mold of the component.

B: Authenticity Verification

Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. Testing shall include verification of the components physical attributes to the original manufacturer's drawing, swabbing, and other applicable testing to verify authenticity. Swabbing shall be performed to the current revision of MIL-STD-883 testing method 2015 using acetone and the alcohol and mineral spirits solution.

C: X-ray Inspection

Each lot to be delivered shall be subjected to an inspection at an AQL of 1.0 or tighter. X-ray inspection shall include checking for the presence of the die, cracks in the epoxy, checking wire bonds, product or manufacturing markings that are X-ray detectable and any mixed die configurations within the same lot/date code.

D: Electrical Testing

Electrical testing of each lot to be delivered shall be completed at an AQL of 1.0 or tighter. Testing shall include verifying electrical specifications from the original manufacturer's technical data sheets as approved by SIS. Testing must be performed at thermal temperatures as identified on the OEM specification.

E: Destructive Physical Analysis

Each lot to be delivered shall be subjected to a DPA inspection of 2% to a maximum of 30 units per lot code. Inspection shall include verification of authenticity of the die and any other internal features that may be shown on the original manufacturer's technical data.

F: Plating Inspection

Each lot shall be verified for lead finish per manufacturer's specification using appropriate methodology such as X-Ray Fluorescence (XRF).

Testing/Analysis Requirements—by Component Type

Component Type	Plating Inspection (F)	Visual Inspection (A)	Authenticity Verification (B)	X-ray Inspection (C)	Electrical Testing (D)	Destructive Physical Analysis (DPA) (E)
Capacitors	X	X			X	
Connectors	X	X	X			
Crystals	X	X	X	X	X	X
Diodes	X	X			X	
Fuses	X	X			X	
Heat sinks		X	X			
IC	X	X	X	X	X	X
Inductors	X	X	X		X	
LED	X	X			X	
Mechanical parts		X	X			
Potentiometer	X	X			X	
Relays	X	X	X		X	
Resistors	X	X			X	
Speakers		X			X	
Switches		X	X			
Transformers	X	X	X		X	
Transistors	X	X			X	

Disposition and Reporting of Counterfeit Parts

Disposition and Segregation

Nonconforming parts shall be segregated and dispositioned per this document. Confirmed counterfeit parts shall be prevented from re-entering the supply chain.

Reporting

All occurrences of counterfeit parts shall be documented and reported, as appropriate, through local SIS Value Stream procedures and to external organizations (i.e. GIDEP, ERAI, law enforcement agencies). Membership and reporting through ERAI (Electronics Retailers Association International) or other industry organizations is strongly encouraged.

Liability

Suppliers shall be held liable for any counterfeit parts entering SIS supply chain up to and including all costs incurred by SIS resulting from the counterfeit parts.

Appendix R: Requirements for Suppliers of Maintenance, Repair, and Overhaul (MRO), Calibration, Deliverable Software/Firmware, and Test Services

Suppliers providing MRO, Calibration, Deliverable Software/Firmware, and Test Services to SIS shall meet the following minimum requirements unless specifically excluded by purchase order or other agreement. Any change in status of the quality management system shall be communicated to SIS.

1. *MRO Suppliers*

Non-certificated MRO Suppliers

MRO suppliers who do not hold a repair station certificate shall be monitored and maintained in accordance with SIS procedures.

Certificated MRO Suppliers

MRO suppliers shall have the appropriate FAA/EASA/CAAC CFR Part 145 certification and comply with AS9110.

2. *Calibration Suppliers*

Calibration suppliers shall be compliant to ISO/IEC 17025. Original Equipment Manufacturers of the equipment to be calibrated that are providing calibration services shall be compliant to AS9100 or ISO9001.

3. *Deliverable Software/Firmware Suppliers*

Deliverable Software/Firmware Supplier Requirements

- All plans discussed in this section shall be submitted to SIS for review and approval prior to the start of the development process. All subsequent revisions/changes shall also be

submitted for review and approval.

- RTCA/DO−178 and AS 9115 shall be the preferred approach for all software/firmware development and quality management. The supplier shall complete and maintain a checklist that defines the RTCA/DO−178 and AS 9115 requirements and supplier compliance to these requirements.
- DO-254 and AS 9100 shall be the preferred approach and quality management system for firmware product realization requirements.
- The Software Quality Assurance (S/W QA) Plan shall include the following:
  - A description of the S/W QA environment, including the scope, organizational responsibilities and interfaces, standards, procedures, tools and methods.
  - A statement of the S/W QA authority, responsibility and independence, including the approval authority for software products.
  - The S/W QA activities that are to be performed for each software life cycle process and throughout the product development including:
    - S/W QA methods, (e.g., reviews, audits, reporting, inspections, and monitoring of the software life cycle processes, etc.)
    - Activities related to the problem reporting, tracking and corrective action system
  - A description of the method used to ensure disposition and retention of any remaining S/W QA open action items, change requests, and completion of all software development tasks at the conclusion of the program
  - A definition of the records to be produced by the S/W QA process
- The Software Development Plan (SDP) shall include the following:
  - Identification of software being developed
  - Resources (e.g., requirement, design code and verification environment, etc.)
  - Organizational structure and responsibilities
  - Software Development process (e.g., including prototype and flight test software, etc.)
  - Software Development schedule and milestones
  - Quality and project records
  - Integrated Product Teams
  - Formal reviews
  - Computer resource utilization
  - Corrective action process
  - Risk management
  - Control and development of software tools
  - Software metrics

- Subcontractor management
- Security and safety requirements
- Data Management/Software Development libraries including documents to be produced
- Program language(s)
- Standards (e.g., requirements, Design code, etc.)
- Development and formal configuration management (if included in the SDP)

- The Software Configuration Management Plan shall include both the developmental and formal configuration management process and the following:

  Note: This plan can be included as part of the SDP.

  - Configuration Identification of all life cycle artifacts (e.g., Software unique identifier, etc.)
  - Configuration Control (e.g., Developmental and Formal, etc.)
  - Subcontractor Configuration Management
  - Organization and Resources
  - Software Configuration Management Roles and Responsibilities
  - Storage, Handling and Security
  - Authorization including the release of project media and master versions of software
  - Version Control
  - Configuration Status Accounting
  - Configuration Audits (e.g., Physical, Functional and Software Development Library Audits, etc.)
  - Access Control

- The Software Test or Verification Plan shall address Computer Software Unit or Module Test and Computer Software Configuration Item (CSCI) Test and include the following:

  Note: This plan can be included as part of the SDP.

  - Identification of the CSCI
  - Software Test Environment including hardware and software elements
  - How installation and Test activities are controlled
  - Configuration and Change Control including test environment
  - Regression Analysis
  - Data Recording, Reduction, Analysis, and Retention including a plan for formal results

4. ***Test Suppliers***

Test suppliers shall be compliant to ISO/IEC 17025.

7. Records

Records required by this procedure shall be documented and retained as described in MSD 402.

8. Revision History

Revision	Change Order No.	CHANGE DESCRIPTION
G	16293-CHO	Revised introduction to specify that MSD 601 includes the requirements of ASQR-01 and UTAS-PRO-SCM-0003. Removed the definition of Qualified Distributor as it is defined as part of the requirements in Appendix H.
F	16040-CHO	Revise Copywrite to 2015. Revise section 5.4 to include 10 year minimum. Delete Appendix P. Clarified supplier responsibility for approvals to use Non-US suppliers/facilities to Appendix J
E	15640-CHO	Update entire document to eliminate redundancy with ASQR-01 and UTAS-SCM-PRO-003.
D	15047-CHO	Changed Appendix G to define the OTD tolerance window as zero calendar days late to three calendar days early.
C	10840-CHO	Corrected typographical errors and hyperlinks throughout. Updated corrective action timing in Appendix E. Changed chargeback amount in Appendix F to $2,500. Updated OTD and supplier Gold definitions in Appendix G. Removed requirements from Appendix H. Added “changes of suppliers” to Appendix I notification requirements.
B	10207-CHO	Section 2 corrected copyright notice: Was: © UTC Sensors and Integrated Systems 2014 Is: © UTC Aerospace Systems, Sensors and Integrated Systems 2014
A	10085-CHO	Document re-formatted and renumbered with new Copyright Notice. Supersedes MSD 740A.1 No content or requirement changes.